

ID-1

2008 – 2027
Clean Watersheds Needs Report

Town of Acton, Massachusetts

July 2008



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For
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Environmental Protection (MassDEP)
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(212800)



TABLE OF CONTENTS

SECTION	PAGE NO.
Executive Summary.....	ES-1
1. FUNDING METHODOLOGY.....	1-1
1.1 Wastewater Funding.....	1-1
1.2 Stormwater Funding.....	1-1
2. CLEAN WATERSHEDS NEEDS SURVEY DATA COLLECTION SYSTEM PACKAGE	2-1
3. ANNUAL CAPITAL NEEDS.....	3-1
4. AFFECT OF CAPITAL NEEDS.....	4-1

LIST OF TABLES

TABLE	PAGE NO.
Table 3-1: Capital Projects and Projected Costs.....	3-2
Table 3-2: Projected Costs and Annual Capital Funding Needs	3-3
Table 3-3: Annual Debt Payment.....	3-4

APPENDICES

- Appendix A: CWNS Project Number 1000 Documentation
- Appendix B: CWNS Project Number 1001 Documentation
- Appendix C: CWNS Project Number 5000 Documentation

EXECUTIVE SUMMARY

As part of the Clean Watersheds Needs Survey (CWNS) Report for the Town of Acton, Massachusetts ("Town"), an assessment of the Town's future wastewater and stormwater needs for the next 20 years was performed, and the associated capital improvement costs were determined. This report presents the needs and cost findings of the CWNS, in addition to an analysis of the Town's current rate structure and their methodology for funding annual or periodic capital improvement projects. The 20 year capital projects along with projected costs and estimated annual capital funding needs are listed in Tables 4-1 through 4-3. Project documentation is located in Appendices A through C.

Background

Acton is located approximately 25 miles northwest of Boston, MA. The Town is situated between the two circumferential beltways that surround Boston, the inner I-95/Route 128 corridor and the outer I-495 corridor. Route 2, a radial corridor serving the greater Boston area, passes through the Town, and is a major commuting route for residents of Acton and outlying communities.

The Town is approximately 20 square miles in area and had a year 2006 estimated population of approximately 20,586 according to the U.S. Census. Acton is wholly located within the Assabet River watershed.

The Town of Acton is currently served by a combination of sewer, cluster, and on-site wastewater management systems. Approximately 15% of all parcels use sewer or cluster systems and 85% of the Town is served by individually owned and maintained onsite wastewater systems (based on 2001 data from the Board of Health and the Assessors' Database).

There is 10% of the community not served by public sewer or onsite wastewater systems. This portion of the community is served by a combination of nine privately owned package wastewater treatment facilities (WWTFs) and nine smaller common, or cluster, onsite wastewater systems. The common systems usually are constructed so that each dwelling or building has its own septic tank that discharges through an effluent sewer to a common disposal field. The common or cluster systems, all with design flows of less than 10,000 gpd, are maintained by condominium or homeowner associations, even in the case of single-family-home developments.

Construction on the Middle Fort Pond Brook Wastewater Treatment Facility and Collection System began in March 2000 and the Facility was brought on line in February 2002. Total project costs, including permitting, design and construction, were \$25.1M. The Town was granted Groundwater Discharge Permit GW#0-656-T#W003143 on January 7, 2000 which limits effluent flow to 250,000 gallons per day (gpd). The facility's discharge permit has since been expanded to 299,000 gpd in 2005. The Acton Wastewater Treatment Facility is a Sequencing Batch Reactor (SBR) facility discharging to Rapid Infiltration Beds (RIBs). The WWTF accepts domestic (residential and commercial) sewage.

The collection and conveyance system serves 678 residential and commercial parcels. Currently, there are 380 (or 56%) connections to the system. The collection system is composed of approximately 70,000 linear feet of gravity sewer and eleven pumping stations of varying capacities, which flow to the WWTF. Gravity sewers are 8 to 18 inch diameter PVC pipe. Service connections are 6 or 8 inch diameter PVC pipe.

The Town of Acton is regulated under the EPA's Phase II Storm Water Program through the General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). To comply with these requirements, the Town has an active Stormwater Management Plan for their storm drain system. Most of Acton's drainage system was constructed in the 1930s. Since about 1980, new commercial and residential developments in Acton have been required to collect and transfer runoff into a vegetated detention basin, as stated in the Town's Subdivision Rules and Regulations. Also through the Subdivision Rules and Regulations, the Town requires the post-development peak rate of stormwater runoff from a subdivision to match the pre-development rate, based on a 10 year design storm.

Needs

The following section presents the need for the three projects listed on the Clean Watersheds Needs Survey.

The proposed Massachusetts Year 2008 Integrated List of Waters lists the Assabet River Segments MA82B-06_2008 and MA82B-07_2008 as Category 5, "Waters requiring a TMDL." These segments are impaired by a number of pollutants, most specifically nutrients and organic enrichment/low Dissolved Oxygen. The projects proposed on the Clean Watersheds Needs Survey will help reduce the occurrence of these pollutants in the Assabet River.

The 2004 Phase I Comprehensive Water Resources Management Plan (CWRMP) identified wastewater disposal needs in Acton through a "Needs Analysis." The Needs Analysis was applied town-wide and determined parcels unsuitable for continued long term reliance upon on-site wastewater disposal systems, through evaluation of specific data, including system age, repair history, septage pumping records, inspection data, variances, private wells location, parcel size, depth to groundwater and bedrock, and percolation rate. This process evaluates wastewater needs without presumptions or unintended bias inherent in preconfigured Study Areas.

The Phase I CWRMP found that over 90% of the existing on-site wastewater disposal systems can remain as on-site systems for the planning period, with approximately 3.5% of these lots requiring innovative/alternative (I/A) technology and/or mounded systems. Lots identified as requiring offsite solutions to wastewater disposal problems are dispersed throughout the community.

Attempting to service only the dispersed lots with off-site solutions would be technically impractical and cost prohibitive. The lots identified as needing off-site solutions were joined by adjacent lots to create fifteen (15) independent service areas that may be more economically feasible to address. These Needs Areas were further reviewed in the Phase II CWRMP, which ultimately recommended sewer extensions to West Acton Center (Needs Area 12) and Spencer/Tuttle/Flint (Needs Area 10) and Wastewater Management Districts for eight Needs Areas.

Existing Rate Structure

The Acton Board of Sewer Commissioners governs the Middle Fort Pond Brook Sewer System. The Acton Board of Selectmen currently is acting as the Board of Sewer Commissioners. Daily operations and communications regarding the sewer system are handled through the Acton Health Department Office. Connection to the system and system use requirements are governed by the Acton Sewer Use Regulations, adopted by the Board of Sewer Commissioners.

The Middle Fort Pond Brook Sewer System was constructed with use of the Massachusetts State Revolving Fund Loan (SRF) Program, which assisted the Town in amortizing a majority of the \$25.1M capital cost. Each of the approximately 700 users were assessed a betterment based upon an equivalent unit system to cover the construction costs. Users' fees are assessed quarterly to cover the operation of the sewer system. All of the system costs, both capital and operational, are borne by the system users. No funding is received from general taxes.

In February 2002 the Board of Sewer Commissioners executed an agreement for private operation of the Acton Wastewater Treatment Facility and Pumping Stations.

For sewer billing, the Town uses the winter (September through March) water usage figures for each property, and calculates the gallons per day (gpd), which is used to calculate monthly sewer usage bills. This rate is used through the year until the new winter bills are issued the following year.

Capital Costs

As shown on Table 3-1, the current capital improvement cost for the Town of Acton is \$22,427,900 (in 2008 \$). This cost represents the projected cost for each individual project from the year of cost estimate (from documentation) to June 2008. These costs were projected using the Engineering News Record (ENR) Construction Cost Index annual average of the year of cost estimate and the June 2008 value.

1. FUNDING METHODOLOGY

1.1 WASTEWATER FUNDING

In implementing its first sewer infrastructure in 2002, Acton used progressive measures to finance the project. These measures were enacted to ensure sustainability of the proposed project, as well as future projects. State Revolving Funds (SRF) were received to finance construction. Intended users fully paid for the cost of the infrastructure. Allocation of costs was based on the zoning potential of each property. Cash flow was managed through gifts. The Town estimated betterments, which allowed them to charge 50% of the costs to the users prior to completion of the project. Public facilities within the service area paid their avoided costs (cost of an on-site solution) spread out over the project payback period. The infrastructure was built to accommodate future users and costs of that expansion capacity were deferred to the future users.

Repayment of the initial loans began in the fall of 2000 and the Town was able to use a \$500,000 gift to offset the loan repayments. In 2001 the Town instituted Estimated Betterments which repaid the \$500,000 gift, as well as the SRF repayments. When construction was completed in 2002, the Town had generated a cash flow that would sustain the repayments through the contract resolution period. After an extended period of contract negotiations, the Town issued Final Betterments in the summer of 2005. The Final Betterments were able to be allocated at less than a \$12,500 assessment for a single family home. Thus far, the repayment rate on betterments is similar to the payment rates on general tax obligations (97%).

Acton's Middle Fort Pond Brook Wastewater Treatment Facility and Collection System is fully funded by users' fees, which are assessed quarterly to cover the operation of the sewer system. All of the system costs, both capital and operational, are borne by the system users. No funding is received from general taxes.

For sewer billing, the Town uses the winter (September through March) water usage figures for each property, and calculates the gallons per day (gpd), which is used to calculate monthly sewer usage bills. This rate is used through the year until the new winter bills are issued the following year.

The Town has a Septage Management Enterprise Fund, into which user fees are deposited. This fund supports the Town's Septage Management Program, which governs operation and maintenance activities of individual on-site wastewater disposal systems. The Middle Fort Pond Brook WWTF is not permitted to receive septage, therefore septage generated in Acton is trucked out of town.

1.2 STORMWATER FUNDING

The Town of Acton does not currently have a stormwater utility or enterprise fund; therefore no money is derived from rate payers. Acton's Stormwater Management Program is funded by Town Meeting approval. There is a small, annual budget appropriated for stormwater problems, but most of these funds go towards operation and maintenance costs rather than capital improvements. Through its Board of Health, the Town applies for funding of capital improvement projects through state and federal grant programs. In 2005, the Town completed a constructed wetland at the North Acton Recreation Area (NARA), which was funded through a Section 319 Competitive grant.

2. CLEAN WATERSHEDS NEEDS SURVEY DATA COLLECTION SYSTEM PACKAGE

This Section includes both the CWNS – Required Information packet and the corresponding coded needs and cost table, which was provided by the Massachusetts Department of Environmental Protection (MassDEP).

CLEAN WATERSHED NEEDS SURVEY

REQUIRED INFORMATION

General Information

The following information shall be provided by the community respondent. The following project types can be reported in the survey as outlined:

	<u>Types of Projects</u>	<u>Series Number</u>
1a.	Wastewater System Projects	1000
1b.	Wastewater Treatment Facility Projects	1000
2.	Stormwater Projects	2000
3.	Decentralized Wastewater Projects (Onsite and clustered wastewater systems)	3000
4.	Non Point Source Projects (See List of Codes)	4000
5.	Other (See List of Codes)	5000
6.	Planning	6000

A. **Community or Authority Name:** Town of Acton

Street Address: 472 Main Street

City or Town and Zip Code Acton, MA 01720

Owner: Public Private or Federal: Public

Community Point of Contact: Doug Halley

Email: dhalley@acton-ma.gov

Phone: 978-264-9634

B. **Wastewater Treatment Facility Information (only)- 1000 Series Projects**

1. NPDES Permit Number: N/A (Groundwater Discharge Permit GW#0-656T#W003143)

2. Treatment Facility Name: Middle Fort Pond Brook Wastewater Treatment Facility

information is available in alternate format. Call This Donald M. Gomes, ADA Coordinator at 617-556-1057, TDD Service - 1-800-298-2207.

MassDEP on the World Wide Web: <http://www.mass.gov/dep>

 Printed on Recycled Paper

3. For new or modified treatment facilities, a brief description should be provided that details specific pollutant source information so that the survey reviewer has a clear understanding of the issues involved with proposed treatment as being necessary for treatment facilities projects N/A (no proposed new or modified treatment facilities)

1a. Description and Type of Existing WWT Facility: Sequencing Batch Reactor (SBR) discharging to Rapid Infiltration Basins (RIBs)

1b. Description of Proposed WWT Facility, if any: N/A

2. Year Treatment Facility Constructed Construction began March 2000
WWTF online February 2002

3a. Coordinates of existing (and proposed) treatment facility: Provide single latitude and longitude with meta data (description of the source of the coordinates):

Method Address Mapping on Google Maps
(Address Mapping; GPS or some other)

Datum World Geodetic System of 1984
(North America Datum of 1927 or 1983/r World Geodetic System of 1984)

3b. Existing

Latitude w/ N or S 42.442014 N

Longitude w E or W -71.437520 W

3c. Proposed

Latitude w/ N or S N/A

Longitude w E or W N/A

4. Primary County Middlesex

5. Primary Congressional District 5th

6. Primary Watershed Assabet River

7. Discharge and Effluent

Existing Outfall is to groundwater (surface waters or any other)

Proposed Outfall is to N/A (surface waters or any other)

1d. Population Receiving Collection Service:

Resident Population	Presently	Projected	Projected Year
	<u>1,450</u>	<u>1,950</u>	<u>2011</u>
Non Resident Population	_____	_____	_____

2a. Total Number of on site septic systems: 4,800

2b. Estimated number of on site systems needing repairs 170

2c. Estimated number of on site systems needing replacement. 340

2d. Estimated Costs for 2b and 2c 2b \$1.7 M to \$2.6M 2c \$8.5 M to \$10.2M

3a. Wastewater is sent to what facility/community: Middle Fort Pond Wastewater Treatment Facility

4. Location: Please provide the following information for 'where' the projects needs exist.

Coordinates:

For any wastewater project type other than Collection Systems - Combined Sewers, Separate Sewers; Interceptor Sewers and Pump Stations

Provide single latitude and longitude with meta data (description of the source of the coordinates):

Method _____
(Address Mapping; GPS or some other)

Datum _____
(North America Datum of 1927 or 1983/r World Geodetic System of 1984)

Latitude w/ N or S _____

Longitude w/ E or W _____

Multiple Projects Here

Project Number	Latitude w/ N or S	Longitude w/ E or W
_____	_____	_____
_____	_____	_____

- 5. Primary County Middlesex
- 6. Primary Congressional District 5th
- 7. Primary Watershed Assabet River

D. **For Stormwater - Series 2000 Projects:**

1. Provide a brief description of the existing **stormwater systems**, and the status of any existing or proposed stormwater management program.

Most of Acton's drainage system was construction in the 1930s. Since about 1980, new commercial and residential developments in Acton have been required to collect and transfer runoff into a vegetated detention basin, as required by the Town's Subdivision Rules and Regulations. The Town is regulated under EPA's Phase II Storm Water Program through the General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) and, to comply with these requirements, has an active Stormwater Management Plan for the stormwater system.

2. Please provide the following information for 'where' the projects needs exist.

Coordinates: For any stormwater project listed on excel spread sheet, please provide a coordinate type:

Location Description: (Center/Centroid: Facility/Station Cords: Lagoon or SettlingPond)

Method

(Address Mapping; GPS or some other)

Datum

(North America Datum of 1927 or 1983
World Geodetic System of 984

Choice for location information:

- a. Single Latitude (N/S)- Longitude (E/W)
- b. Polygon
- c. Indicate Entire County
- d. Indicate Entire Watershed
- e. Indicate Entire Town

Project Number

a , b, c, d or e

_____	_____	_____
_____	_____	_____
_____	_____	_____

2a. Primary County Middlesex

2b. Primary Congressional District 5th

2c. Primary Watershed Assabet River

3. ANNUAL CAPITAL NEEDS

The assessment of the Town's stormwater and wastewater needs for the next 20 years, in addition to their funding methodology, provides an estimate of the annual capital expenditures required by the Town to fund their needs. The identified 20 year capital projects along with projected costs and estimated annual capital funding needs are shown in Tables 3-1 through 3-3.

Table 3-1: Capital Projects and Projected Costs
2008 - 2027 Clean Watersheds Needs Survey
Town of Acton, Massachusetts

CWNS Project Number	Project Description	Project Design Duration (years)	Project Construction Duration (years)	Year of Project Cost	Project Cost	Project Cost (\$2008) ^a	Implementation Fiscal Year ^b	Projected Project Cost to Implementation Year ^c	Bonded Years ^d	Bond Interest ^d
1000	Sewer Extension to Spencer/Tuttle/Flint	1	1	2008	\$4,307,000	\$4,307,000	2010	\$4,569,296	20	2%
1001	Sewer Extension to West Acton Center	1	1	2008	\$3,865,000	\$3,865,000	2010	\$4,100,379	20	2%
5000	EPA Level 4 Wastewater Management District	N/A	N/A	2006	\$13,500,000	\$14,255,900	2009	\$14,751,815	20	2%
					Total:	\$22,427,900				

^a Fiscal Year: July 1 - June 30
^b Based on ENR Index using annual average from Year of project cost and June 2008
^c Based on inflation of 3%
^d Bonded years and Interest will be determined during design and bidding

Table 3-2: Projected Costs and Annual Capital Funding Needs
 2008 - 2027 Clean Watersheds Needs Survey
 Town of Acron, Massachusetts

CWNS Project Number	Project Description	FY2008		FY2010		FY2011		FY2012		FY2013		FY2014		FY2015		FY2016		FY2017		FY2018		FY2019		FY2020		FY2021		FY2022		FY2023		FY2024		FY2025		FY2026		FY2027		FY2028		FY2029		FY2030	
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030																					
1000	Sewer Extension to Spencer/Fulke/Filini		\$4,509,256																																										
1001	Sewer Extension to West Acron Centes		\$4,100,379																																										
5000	EPA Level 4 Wastewater Management District	\$14,751,815																																											
Total Bonded		\$14,751,815	\$23,421,489	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		

Project costs based on 3% annual inflation

Table 3-3: Annual Debt Payment
2008 - 2027 Clean Watersheds Needs Survey
Town of Acton, Massachusetts

CWNS Project Number	1000		1001		5000		Total Debt Service
	Sewer Extension to Spencer/Tuttle/Flint		Sewer Extension to West Acton Center		EPA Level 4 Wastewater Management District		
Fiscal year	Bond Sale Amount	Annual Bond Debt Service	Bond Sale Amount	Annual Bond Debt Service	Bond Sale Amount (maximum)	Annual Bond Debt Service	
FY2009					\$14,751,815	\$902,811	\$902,811
FY2010	\$4,569,296	\$279,641	\$4,100,379	\$250,943		\$902,811	\$1,433,395
FY2011		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2012		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2013		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2014		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2015		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2016		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2017		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2018		\$279,641		\$250,943		\$902,811	\$1,433,395

CWNS Project Number	1000		1001		5000		Total Debt Service
Project Description	Sewer Extension to Spencer/Tuttle/Flint		Sewer Extension to West Acton Center		EPA Level 4 Wastewater Management District		
Fiscal year	Bond Sale Amount	Annual Bond Debt Service	Bond Sale Amount	Annual Bond Debt Service	Bond Sale Amount (maximum)	Annual Bond Debt Service	
FY2019		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2020		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2021		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2022		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2023		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2024		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2025		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2026		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2027		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2028		\$279,641		\$250,943		\$902,811	\$1,433,395
FY2029		\$279,641		\$250,943			\$530,584
FY2030							\$0
FY2031							\$0

4. AFFECT OF CAPITAL NEEDS

As previously stated, the Town of Acton funds its wastewater system through betterments and user rates. The proposed sewer extensions will be funded through betterments and operation and maintenance will be covered by user rates. The estimated betterment for sewer extensions to Spencer/Tuttle/Flint (Project Number 1000) is \$40,000 to \$57,000 per Sewer Betterment Unit (SBU). The estimated betterment for sewer extensions to West Acton Center (Project Number 1001) is \$36,000 to \$61,000 per SBU. Currently, the Town reviews wastewater rates annually, and adjusts the rates according to the water use figures. After assessing the Town's 20 year capital needs in the previous section, the Town will be able to fund the future capital improvements through the planned betterments. The operations and maintenance will continue to be covered by the existing user rate system.

With the Septage Management Enterprise Fund, the Town has a dedicated funding source that has the ability to evolve along with any wastewater management plan that is chosen. To sustain the proposed Wastewater Management District (WWMD) (Project Number 5000), the Town can assess a yearly fee to cover the expenses of the program. This fee, assuming 5% interest rate comparable to the sewerage present worth analysis, amounts to approximately \$380 per year per parcel. Currently, the Town requires pumping of septic systems every two years at an approximate cost of \$200 per pumping event. The yearly WWMD fee includes increased monitoring, pumping, inspections, and operations and maintenance.

DRAFT



APPENDIX A: CWNS PROJECT NUMBER 1000 DOCUMENTATION

Massachusetts Category 5 Waters "Waters requiring a TMDL"

NAME	SEGMENT ID	DESCRIPTION	SIZE	POLLUTANT NEEDING TMDL [EPA APPROVAL DATE-DOCUMENT CONTROL NUMBER]
Assabet River (8246775)	MA82B-03_2008	From the Route 20 Dam, Northborough to the Marlborough West WWTP discharge, Marlborough.	2.4 miles	-Nutrients [9/23/2004-CN201.0] -Pathogens -Taste, odor and color -Noxious aquatic plants -(Exotic species*) -(Objectionable deposits*)
Assabet River (8246775)	MA82B-04_2008	From the Marlborough West WWTP discharge, Marlborough to the Hudson WWTP discharge, Hudson.	8.0 miles	-Cause Unknown -Metals -Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Pathogens -Noxious aquatic plants [9/23/2004-CN201.0]
Assabet River (8246775)	MA82B-05_2008	From the Hudson WWTP discharge, Hudson to the USGS gage at Routes 27/62, Maynard.	8.2 miles	-Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Pathogens -Taste, odor and color -Noxious aquatic plants -(Exotic species*) -(Objectionable deposits*)
Assabet River (8246775)	MA82B-06_2008	From the USGS gage at Routes 27/62, Maynard to the Powdermill Dam, Acton.	1.2 miles	-Priority organics -Metals -Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Thermal modifications -Taste, odor and color -Noxious aquatic plants [9/23/2004-CN201.0] -(Exotic species*) -(Objectionable deposits*)
Assabet River (8246775)	MA82B-07_2008	From the Powdermill Dam, Acton to the confluence with the Sudbury River, Concord.	6.4 miles	-Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO <9/23/2004-CN201.0> -Pathogens
Assabet River Reservoir (82004)	MA82004_2008	Westborough	338 acres	-Metals [12/20/2007-NEHgTMDL] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Noxious aquatic plants -Turbidity -(Exotic species*)
Carding Mill Pond (82015)	MA82015_2008	Sudbury	40.5 acres	-Nutrients -Noxious aquatic plants -(Exotic species*)
Lake Cochituate (82020)	MA82020_2008	[North Basin] Natick/Framingham/Wayland	196 acres	-Priority organics -Organic enrichment/Low DO -(Exotic species*)
Lake Cochituate (82125)	MA82125_2008	[Middle Basin] Natick/Wayland	135 acres	-Priority organics -Organic enrichment/Low DO -Pathogens -(Exotic species*)

**COMPREHENSIVE WATER RESOURCES
MANAGEMENT PLAN/ENVIRONMENTAL
IMPACT REPORT PHASE I
EXISTING CONDITIONS, FUTURE
REQUIREMENTS AND PROBLEMS
IDENTIFICATION (DEFINITION OF NEEDS)
ACTON, MASSACHUSETTS**

Environmental Engineers/Consultants

LOMBARDO ASSOCIATES, INC.

49 Edge Hill Road
Newton, MA 02467
(617) 964-2924



WOODARD & CURRAN
Engineering • Science • Operations

980 Washington Street, Suite 325
Dedham, MA 02026
(781) 251-0200

June 2004

Additionally, the recent Wellhead Protection Study (2002) identified 47 septic systems over 2,000 gpd in Zone IIs that may impact water quality. These septic systems are included in the Acton Water District's GIS database available to the Town.

6.7 AREAS IN NEED OF OFF-SITE WASTEWATER SOLUTIONS

Figures 6-2 and 6-3 illustrate the probable grouping of the needs areas resulting from the needs assessment. Identified in the figures are:

- Parcels requiring offsite solutions,
- Parcels requiring mounded systems, and
- Large septic systems.

Lots identified as requiring offsite solutions to wastewater disposal problems are dispersed throughout the community. Attempting to service only the dispersed lots with off-site solutions would be technically impractical and cost prohibitive. Grouping "needs" lots geographically is more feasible technically and financially. Still, wastewater infrastructure constructed to serve the "needs" lots will also create links to other adjacent lots, creating potential service areas. Therefore, preliminary service/study areas have been developed that link nearby "needs" lots with lots not exhibiting pending needs.

All the identified "needs" parcels require offsite solutions. Therefore, each area reflects the same priority as determined by the methodology presented in this report. However, the order in which the Town addresses the needs areas may be developed by several methods including assigning the highest priority to the largest needs areas first or by prioritizing the needs areas that lend themselves to solving the wastewater disposal problem most quickly and inexpensively.

Figure 6-2 displays the minimum study areas based on combining closely grouped areas determined to require off-site solutions. Lots adjacent to the "needs" lots are also included to maximize the cost-effectiveness of the system. The table included with the figure lists the number of parcels in the study area and the expected wastewater flow from each parcel grouping. Total estimated flow from the minimum study areas is approximately 110,000 gallons per day.

Figure 6-3 displays the maximum study areas based on combining closely grouped areas requiring off-site solutions and adjacent parcels requiring mounded systems. Total estimated flow from the maximum study areas is approximately 265,000 gallons per day. There are several other areas where mounded systems will most likely be required but the analysis has not identified these areas as requiring off-site solutions.

FIGURE 6-2: MINIMUM SERVICE AREAS

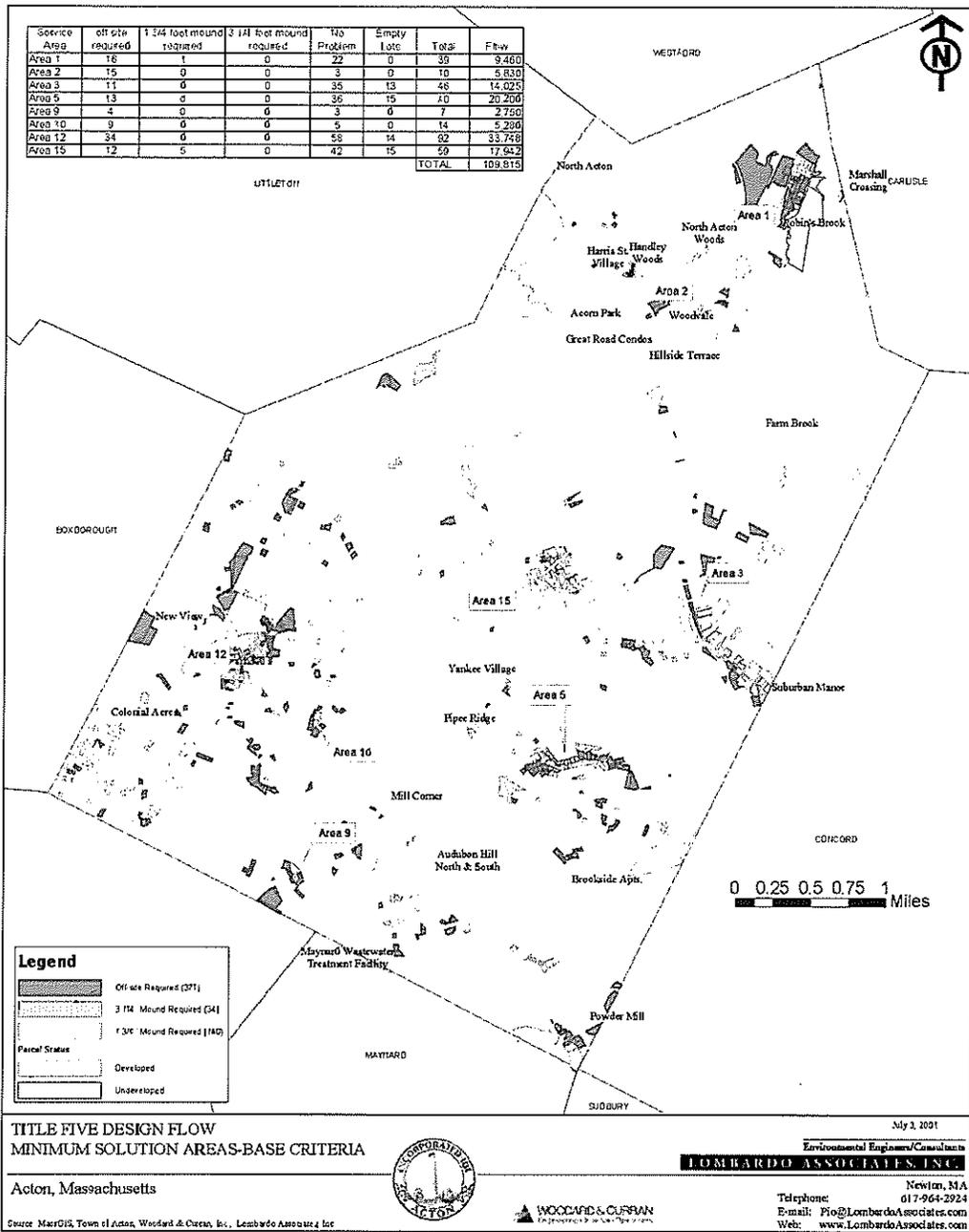
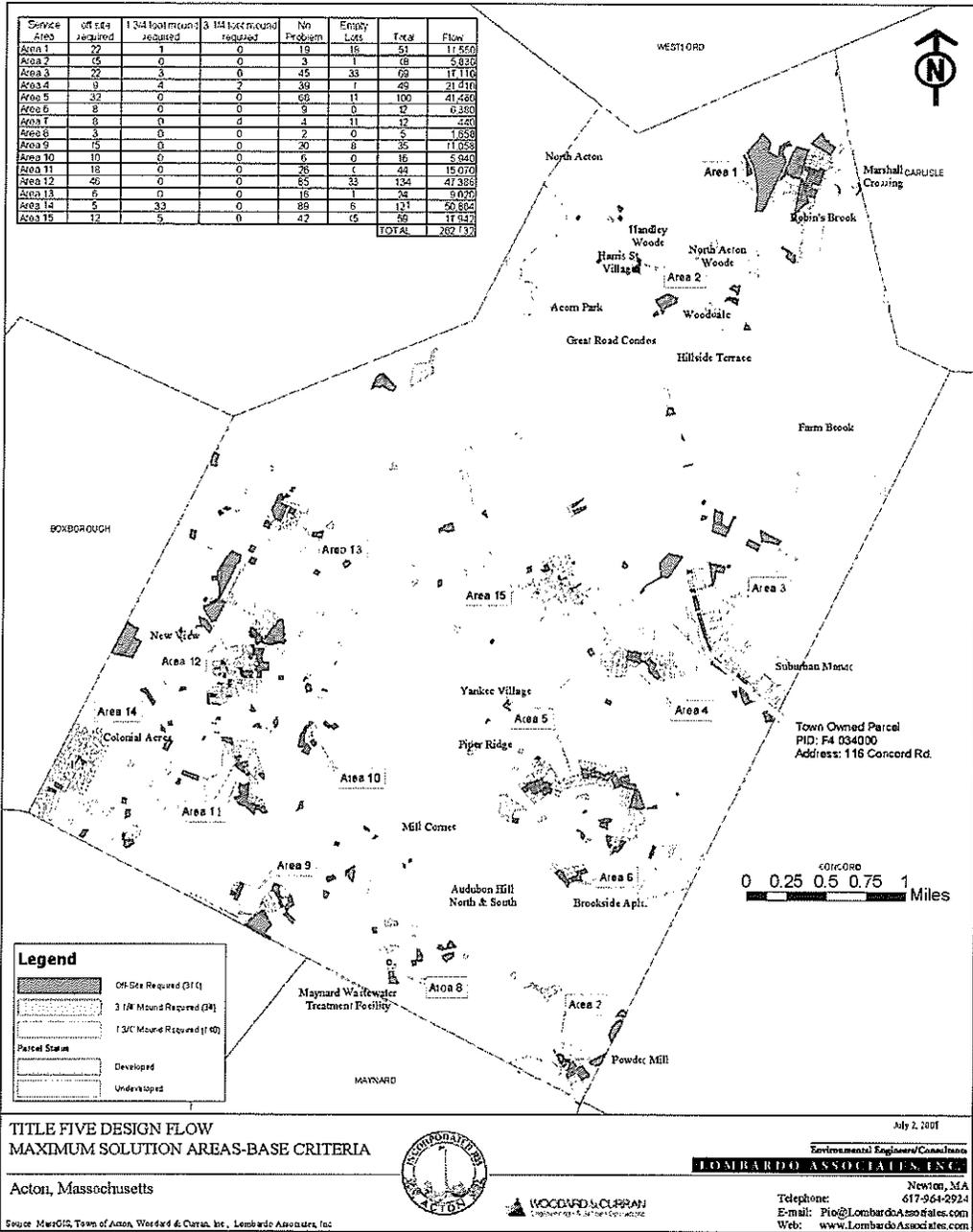


FIGURE 6-3: MAXIMUM SERVICE AREA



The grouping of study areas are the result of the GIS and database analysis of the needs criteria, interviews with town staff, CAC input, field review, and literature research. These groupings form a framework for discussing and evaluating the minimum and maximum number of parcels included in off-site systems. The boundaries of these areas will be refined and the requirement for off-site solutions will be reviewed in conjunction with potential treatment and disposal options in the next phase of the planning process.

6.8 POTENTIAL SATELLITE WASTEWATER DISPOSAL LOCATIONS

6.8.1 Introduction

The principal tool used in identifying Areas of Interest (AOI's) with potential for wastewater disposal has been the database available from the Town of Acton's GIS system and data from MassGIS. These data bases have allowed the important and limiting characteristics of soil type, such as depth to groundwater, and level of development to be combined in eliminating all areas of the Town which are inappropriate for further consideration.

All evaluations of areas eliminated or included under the various criteria below were conducted on a parcel base map available from the Acton GIS system. Physical characteristics of parcels, the areas of parcels and linking to the developed status for each parcel were carried out using GIS tools.

6.8.2 Criteria

Soil Type

The most significant characteristic in eliminating portions of Town unsuitable for wastewater effluent disposal is soil type. Areas without water-lain deposits of sands and gravels are not expected to be able to infiltrate wastewater effluent quickly enough to be of value in a small municipal disposal program. Thus areas without these soil characteristics are eliminated from consideration.

Seasonal High Groundwater

Another significant hydrogeologic characteristic for wastewater disposal is the depth to seasonal high groundwater. MA DEP regulations require a minimum of four feet of unsaturated soils below the wastewater effluent discharge facility, after any groundwater mounding has occurred. As an initial criterion, to allow for limited mounding and some embedment of the facility, areas with 6 feet or less to seasonal high groundwater are rejected. This criteria may be revisited in subsequent phases if a parcel is identified that meets all other criteria and would benefit from some effort in adding soil to increase the surface elevation above the groundwater level.

Developed land

Development or building on parcels, particularly residential development on small lots, is not desirable when selecting wastewater effluent disposal locations due to potential disruption of residents during construction and frequent resistance and concern about having a nearby facility. Thus an initial evaluation is to eliminate all but vacant parcels.

However, an additional analysis was conducted at the request of the CAC and Health Department. The CAC identified several parcels that are largely unused, with one or a few buildings, on large lots. The Health Department identified additional lots based on knowledge of the local soils and groundwater. The

**Comprehensive Water Resources Management
Plan (CWRMP) – Phase 2**

Volume 1 of 5

Town of Acton, MA

**March 2006
Revised June 2006**



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2.3 EVALUATION CRITERIA

A main component of the Phase 1 process was the assessment of the need for alternative wastewater disposal other than continued reliance on conventional onsite wastewater systems. A maximum of 15 Needs Areas were identified. Figure 1-2 shows the location of the following Needs Areas.

1. Marshall Crossing / Robbins Brook / North Acton Village
2. Nagog Woods / Acorn Park / North Acton Woods
3. East Acton Village / Route 2A
4. Concord Road / Robbins Park
5. Brucewood Estates
6. Brookside Apartments/Circle
7. Powdermill Plaza
8. Maynard border / South Main Street
9. Heath Hen Meadow / Billings and Stow Streets
10. Spencer Road and Tuttle/Flint/Mallard neighborhood
11. Nash and Downey Roads / Dover Heights
12. West Acton Center
13. Indian Village
14. Flagg Hill
15. Acton Center (Town Hall) / Patriot's Hill

2.3.1 Needs Areas Development

The Needs Areas were developed through the evaluation of technical and non-technical criteria in a multi-step process involving an interactive dialogue between the Project Team and a very involved CAC. Phase 1 included the first two steps, with Phase 2 picking up with Step 3.

2.3.1.1 Phase 1 Needs Areas Development

Step 1 – Identify Needs in Acton

Areas in need of wastewater disposal solutions are identified. The data from the BOH records, CAC input, previous reports and studies, surface water and groundwater sampling, and local regulations and bylaws form the basis for the analysis of the “needs”. Potential technical alternatives for wastewater collection, treatment, disposal and management are evaluated for application in Acton.

Step 2 – Create Needs Areas

Needs Areas are created based on the technical evaluation and on “non-technical” parameters. Technical criteria include regulatory setback requirements, design parameters, and data on special designs from Board of Health (BOH) records. The CAC reviewed the technical information and provided anecdotal



evidence to complement the technical criteria. Table 2-1 lists the technical criteria evaluated as part of Phase 1, Step 2.

Table 2-1: Technical Criteria for Phase 1

Regulatory Minimum Setbacks	Design Parameters / BOH Data
• Property Line	• Percolation Rate
• Buildings	• Depth to Groundwater
• Wetlands	• Depth to Bedrock
• Floodplains	• Mounded Construction
• Surface Water	• Variances
• Public Well	• Special Technologies (I/A, etc.)
• Private Well	
• Vernal Pools	

Table 2-2 presents the Non-Technical Criteria evaluated as part of Phase 1, which include items raised by the CAC. The non-technical criteria process was used to verify the selection of technical Needs Areas and ensure that the community's entire needs were considered.

Table 2-2: Non-Technical Criteria for Phase 1

Non-Technical Criteria	
• Aesthetics (mounded systems, tree removal, etc.)	• Location of human sensitive receptors
• Neighborhood character – maintain the rural nature of Acton	• Potential to link solution to other opportunities
• Consistency with other town plans	• Regulatory pressure
• Growth – in designated areas	• Ability to implement solution given location, costs, etc
• Archeological and historical impacts	• Costs
• Optimization of existing sewer system	• Protection of environment (wetlands, groundwater, etc)

The CAC recognized that potential solutions are inextricably linked to the criteria that determines Needs Areas and therefore considered the potential to link the solution to other opportunities, such as rail trail construction, as needs criteria for evaluation.

The Project Team presented potential technological solutions to the CAC for evaluation. In-town locations for disposal facilities were identified though an evaluation similar to the needs assessment by searching for publicly owned property and large tracts of private land with favorable soils located outside of sensitive resource areas. Table 2-3 presents the technology alternatives for solutions and the criteria for assessment for disposal sites conducted as part of Phase 1.



Table 2-3: Technology Alternatives and Disposal Site Evaluation

Preliminary Technology Evaluation	Disposal Site Evaluation
<ul style="list-style-type: none">• Onsite	<ul style="list-style-type: none">• Percolation rate (soils type)
<ul style="list-style-type: none">• Clusters	<ul style="list-style-type: none">• Depth to groundwater
<ul style="list-style-type: none">• Decentralized	<ul style="list-style-type: none">• Depth to bedrock
<ul style="list-style-type: none">• Centralized in-town	<ul style="list-style-type: none">• Sensitive human receptors
<ul style="list-style-type: none">• Centralized regional	<ul style="list-style-type: none">• Sensitive environmental receptors
	<ul style="list-style-type: none">• Well impacts
	<ul style="list-style-type: none">• Proximity to Needs Areas
	<ul style="list-style-type: none">• Availability of land

Potential disposal locations are identified through analysis of the technical criteria and by applying the “non-technical” criteria in a method similar to the process used to create Needs Areas.

2.3.1.2 Phase 2

Phase 2 of the CWRMP began with Step 3, in which the CAC finalized the criteria for each Needs Area.

Step 3 – Create Needs Planning Areas

The CAC began the Phase 2 process by assessing the Needs Area groupings developed in Phase 1. The areas were refined based on topography, underlying geology, and socio-economic factors, such as traditional neighborhood boundaries and planned economic growth areas. Figure 2-2 shows the Needs Planning Areas (Areas). The Areas are deliberately large to capture environmental similarities within the Areas, and encompass entire neighborhoods that traditionally may be perceived as single entities. Final solutions may encompass the entire Needs Planning Area or portions of the Areas depending on the needs and a final evaluation prior to program implementation.

Step 4 – Finalize Criteria Ranking

The CAC agreed the Needs Planning Areas identified at this point are in need of new solutions from a technical needs viewpoint. The CAC agreed that all of the technical criteria addressed environmental concerns and are therefore of equal rank, but some “non-technical” criteria are more important than others.

Priority non-technical criteria that address potential solutions include implementability; growth, especially economic growth in areas designated for growth; optimization of the current wastewater infrastructure and wastewater treatment facility (WWTF); and reclaimed water use and recharge of groundwater/aquifers. These criteria are not explicitly attached to specific Areas; rather they are primary, or overriding, criteria for all Areas. A summary of the CAC’s input on important non-technical criteria is:



1. Implementability

Implementability includes of the feasibility of a technical solution, probability of permitting, considerations such as addressing the areas initially planned to be part of an expanded sewer district as part of the Middle Fort Pond Brook system, and local residents' perceptions.

The availability of implementable solutions governs the final recommended solutions. Often a Needs Planning Area will have multiple technical solutions. But, when considering potential solutions, political, financial and popular opinions play a role. The CAC concluded that implementability also meant the ability to convince Town Meeting that the recommended plan is the correct plan, especially considering that residents who were included in the initial plans for an expanded sewer district may not be served under the CWRMP's framework.

The timeline for implementation is also important because of the timing of related projects. The CAC would like to see structural solutions link to other opportunities such as rail trail construction and recreation field development. In addition, pressure from regulatory agencies to solve specific current, potential, or pending, problems may drive the solutions at a schedule different from the CWRMP implementation schedule.

2. Growth

Potential economic growth areas include West Acton Center/Village (Area 12) and East Acton Village (Area 3) extending along Route 2A. The village areas in particular have developed special planning documents and zoning that target the villages for economic growth, but in character with the existing mixed-use environment.

Secondary growth impacts (positive and negative) should be evaluated if expanded wastewater disposal capacity, such as sewerage, is considered in a village area.

Needs Planning Areas

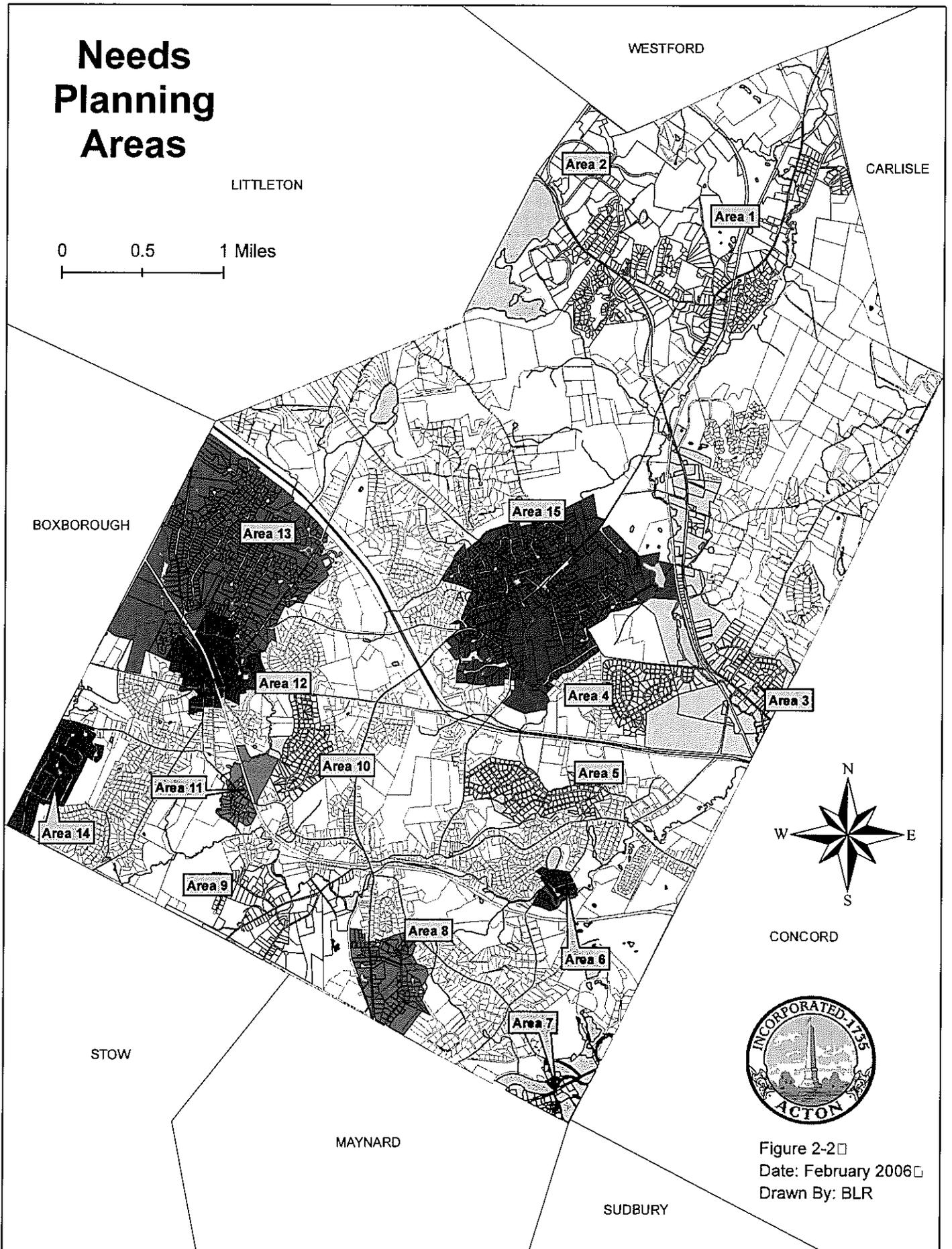


Figure 2-2 □
Date: February 2006 □
Drawn By: BLR



3. Optimization

Optimization of the current wastewater infrastructure and treatment facility, which may include connecting as many properties as possible to fully use the pipes, pump stations and treatment facility may achieve an economy of scale. The CAC agreed that if additional sewerage is developed, the infrastructure should address the Needs Areas as the priority. Solutions should be linked to lots that actually need a solution, not conveniently connecting contiguous properties while leaving out a nearby Needs Area, even if more expensive.

4. Reuse/recharge

Use and recharge of reclaimed water, whether treated wastewater or stormwater, includes finding disposal locations within Acton to recharge the local aquifer instead of seeking a surface water discharge. The existing sewer collection and treatment facilities could be used in conjunction with subsurface discharge locations located some distance from the treatment facility. Other satellite treatment and disposal systems could be located in areas that may recharge aquifers. Wastewater effluent discharge for the purpose of recharging drinking water aquifers may also be a long-range option.

Acton, as a NPDES Phase II community, is undertaking programs to control, manage, and treat stormwater runoff. Acton's S.319 grant addressed the difficulty of siting end-of-pipe treatment and recommended on-site controls. Infiltration in particular can benefit local aquifers. Low Impact Development (LID) is one technique that addresses stormwater at its source instead of through end-of-pipe solutions. Increased infiltration and runoff control is being addressed through development of Acton's post-construction runoff control bylaw.

Step 5 – Rank Needs Planning Areas

Once the criteria were established and finalized, the CAC identified the criteria most important to each Area through discussion of each criteria for each Needs Area. Next the Areas were prioritized through discussion and vote, followed by prioritization of solutions, again through discussion and vote for each Area. The next section presents a detailed discussion of the alternatives assessment process.

2.4 EVALUATION OF ALTERNATIVES

The CAC meeting process from June 2004 through April 2006 provides the road map to the evaluation of alternatives. During these meetings, the Project Team and CAC evaluated and ranked each alternative solution for each Needs Planning Area. Meeting minutes and public outreach material are compiled in Appendix B.

The CAC set some general limits to the feasibility of potential solutions. Generally, extending the existing collection system for Areas north of Route 2 or construction of new collection and treatment systems for Areas adjacent to the existing collection system are considered not feasible.

The CAC prioritized the needs criteria in each Area and then prioritized the Areas. Potential solutions were identified that addressed the needs criteria and resolved environmental and public health concerns. The CAC then ranked the solutions, identifying preferred solutions for each Area that reflected the community's goals for each area and addressed the primary criteria of implementability, economic growth, optimization, and reuse/recharge.



creation of a final plan. The feasibility study can start as soon as Town Meeting appropriates funds, or as soon as funding (grant) opportunities are available. The town has submitted requests for the development of similar programs to several funding programs (s.319, 604b, CZM) without success. Therefore, the town should appropriate funds in fall 2006 to develop the framework of Wastewater Management Districts in Acton. The process should be complete within one year of the appropriation with active citizen involvement.

3.3 SUMMARY OF THE RECOMMENDED PLAN

3.3.1 Long-Term Recommendations

Figure 3-4 presents the visual guide to the final recommendations. It includes West Acton Center-A in the recommendations for sewer extension with West Acton-B included under a Wastewater Management District. Final capacity availability and wastewater flows will be determined as part of a preliminary design phase and ENF process associated with the recommended solution. Table 3-7 contains the primary recommendations and provides the menu of other viable alternatives available to each Area.

Sewer Extensions

- Powdermill Plaza / High Street (Area 7) – The CWRMP concurs with the Town’s decision to move forward with sewer construction
- Spencer/Tuttle/Flint (Area 10)
- West Acton Center-A (Area 12)

Cluster (Public/Private)Systems

Areas recommended for cluster system solutions could also be included in Wastewater Management Districts if cluster systems are not implementable or wastewater management could be implemented in conjunction with cluster systems.

- Marshall Crossing / Robbins Brook (Area 1)
- Nagog Woods/ Acorn Park / North Acton Woods (Area 2)
- East Acton Village (Area 3)
- Brookside Circle (Area 6)
- Nash and Downey Roads / Dover Heights (Area 11)

Wastewater Management Districts

- Robbins Park (Area 4)
- Brucewood Estates (Area 5)
- Maynard Border (Area 8)
- Heath Hen Meadow (Area 9)
- West Acton Center-B (Area 12)
- Indian Village (Area 13)
- Flagg Hill (Area 14)
- Acton Center (Area 15)

Recommended Solutions For Needs Planning Areas

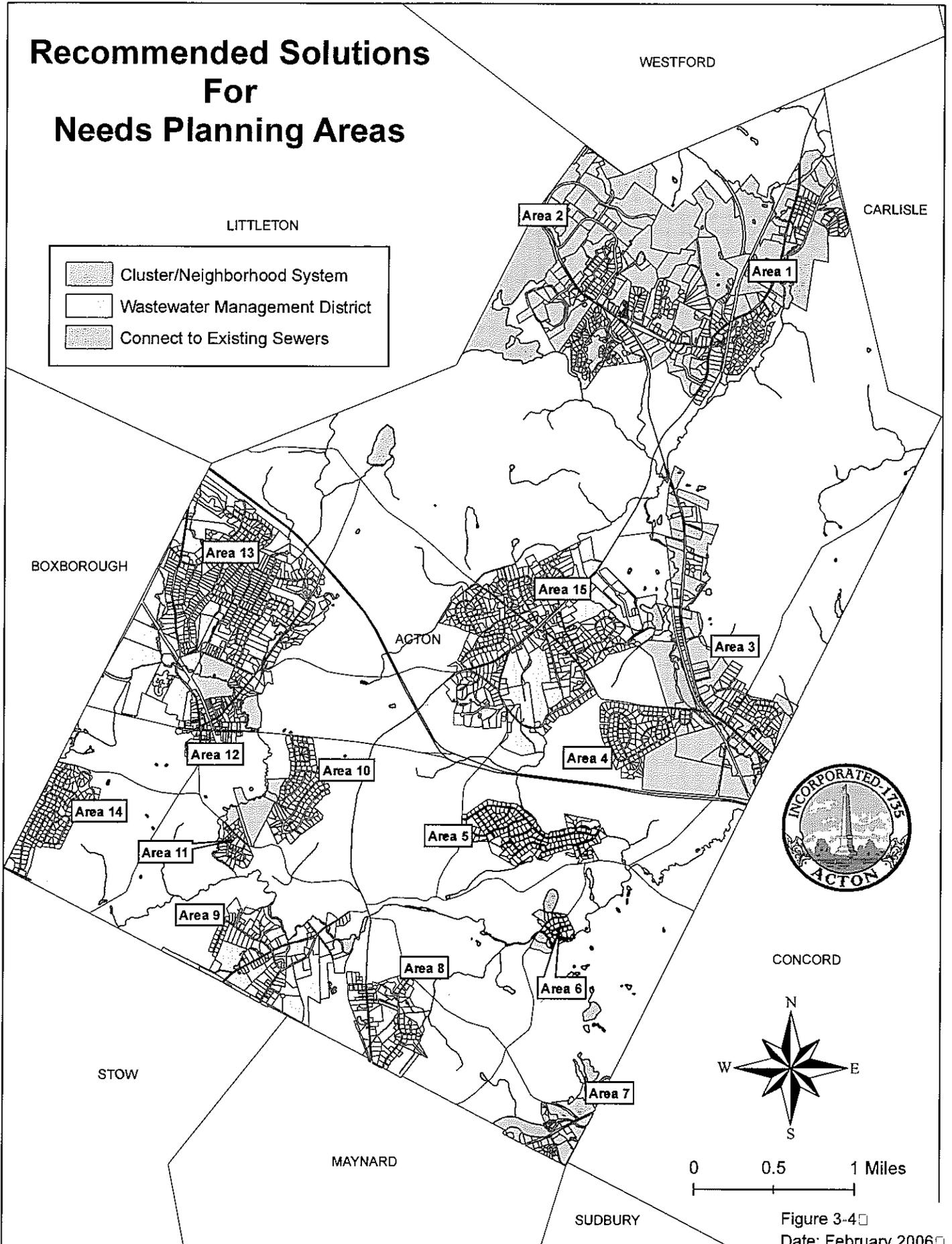


Figure 3-4
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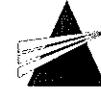


Table 3-7: Recommended Solutions Matrix

Needs Area #	Description	Current Priority Status	Rank (1-4) with 1 being the recommended choice (NA = Not Applicable)			
			Connect to Existing Sewers	Construct New WWTF/Sewers	Cluster System	Wastewater Management District
1	North Acton Village Marshall Crossing Robbins Brook	Medium	NA	3	1	2
2	Nagog Woods Acorn Park North Acton Condos	Low	NA	2	1	NA
3	East Acton Village Route 2A	High	NA	2	1	3
4	Concord Road Robbins Park	Low	NA	2	3	1
5	Brucewood Estates	Medium	3	NA	2	1
6	Brookside Circle	Low	3	NA	1	2
7	Powdermill Plaza	High	1	NA	NA	NA
8	Maynard Border	Medium	2 Maynard or Acton	NA	3	1
9	Heath Hen Meadow / Stow Street	Low	3	NA	2	1
10	Spencer / Tuttle / Flint	High	1	NA	NA	2
11	Nash / Downey Dover Heights	Medium	NA	NA	1	2
12	West Acton Center – A	High	1	NA	2	3
12	West Acton Center – B	High	2	NA	3	1
13	Indian Village	High	NA	3	2	1
14	Flagg Hill	Medium	NA	NA	2	1
15	Acton Center	Low	NA	2 - East Acton	3	1



Other Long-Term Recommendations

- Continue the surface and groundwater sampling program to integrate the programs with Wastewater Management Districts and monitor watershed health.
- Continue to monitor the advances and regulations regarding reclaimed water use in Massachusetts.
- Continue a proactive public outreach and participation program and coordinate efforts with the NPDES Phase II Stormwater Management Program and Acton Water District initiatives.

3.3.2 Short-Term Recommendations

- Develop a feasibility study for developing Wastewater Management Districts.
- Conduct a small scale pilot study of technologies for reclaimed water use once regulations provide guidance to treatment and discharge requirements.
- Appropriate funds in fall 2006 for final study and conceptual design of the Spencer / Tuttle / Flint and West Acton Center-A sewer extension, including public outreach and MEPA submittal.
- Appropriate funds in spring 2007 for design of Spencer / Tuttle/ Flint and West Acton Center-A solutions, and to submit a State Revolving Fund application for a construction loan.
- Submit an application for State Revolving Funds for construction of the Spencer / Tuttle / Flint and West Acton Center-A sewer extension in August 2007.
- Appropriate funds in spring 2008 for construction of the Spencer / Tuttle / Flint and West Acton Center-A sewer extension scope as determined through the conceptual and final design phases.
- Pursue legislative changes to the betterment rules to allow redistribution of betterment assessments for funding of the sewer projects.

3.4 ENVIRONMENTAL IMPACTS OF THE RECOMMENDED PLAN

The Recommended Plan is comprised of non-structural, private, and public structural solutions that will benefit the overall environmental health of Acton's water resources and reduce risks to public health. The recommended structural solution, extending sewers to High Street (Powdermill Plaza), and the Spencer/Tuttle/Flint area and West Acton Center-A, will have some temporary construction impacts from noise, dust, and traffic due to general excavation activities. However, new NPDES Phase II requirements to regulate construction site runoff are directed at mitigating short-term and long-term impacts of construction.

The recommended plan takes measures to minimize the environmental impact of construction activity through design, such as minimizing cross-country excavations and locating pump stations and other infrastructure away from resource areas, and during construction, such as requiring erosion control measures to control runoff impacts.

The recommended plan does not require additional disposal area or treatment facility construction. The Adams Street WWTF does not need alterations or expansion to accept and adequately treat and dispose of the wastewater. The sewer extension recommended for Spencer/Tuttle/Flint and West Acton Center-A would increase existing WWTF by over 10%, which triggers a MEPA threshold for an ENF submittal.

COMMITMENT & INTEGRITY
DRIVE RESULTS

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May 8, 2008

Doug Halley, Director of Health
Board of Health
Town of Acton
472 Main Street
Acton, MA 01720

RE: Letter Report
Design Basis Report for Sewer System Extension
Spencer/Tuttle/Flint & West Acton Center A
Acton, Massachusetts

Dear Mr. Halley:

The following letter report details the conceptual layout and preliminary engineering design requirements for the West Acton Center and Spencer, Tuttle, & Flint (STF) sewer extension project as recommended in the Feasibility Study and Conceptual Design Technical Memorandum dated March 26, 2008. The results of this study were presented at a public meeting to the Acton Water Resources Advisory Committee on March 12, 2008. (Woodard & Curran (W&C) presentation is attached). Once reviewed and validated by the Town of Acton, the detailed design phase will commence. This Design Basis Report is a more detailed discussion of the recommended scenario of alternatives which includes STF-1 and WAC-1. There is currently sufficient capacity at the Acton WWTP to receive flow from both of these selected project areas. If these two project areas are combined into one construction project, the project will benefit from cost savings from an economy of scale. A description of the two alternatives that make up this scenario is as follows:

West Acton Center - This alternative is similar to the conceptual layout in the Sewer Extension Proposal from July 2007. A pumping station on West Road will collect sewer flows from all of West Acton Center east of the railroad except for Massachusetts Avenue. This pump station will discharge to a gravity sewer near the final pump station along Massachusetts Avenue. This is the conservative approach including a pumping station at the end of West Road which may be excluded as discussed in the alternative below. The portion of Massachusetts Avenue on the west side of the Brook will gravity feed to the pump station. This final pumping station will discharge to the Massachusetts Avenue Sewer east of Prospect Street. This will include one river crossing. The portion of Massachusetts Avenue east of the river will consist of a low pressure sewer extending to the Massachusetts Avenue Sewer requiring approximately 17 grinder pumps. The sewers in this alternative are positioned within the roadway layout or on Town property, eliminating the need for any easements. The proposed layout is attached in Figure 1: Recommended Alternatives WAC-1 & STF-1.

An option for these alternatives exists along Massachusetts Avenue east of the Brook which will be served by low pressure sewers. If the STF area is sewerred first, this option would entail replacing a segment of the low pressure sewer by gravity sewers and connecting directly into the Flint Road gravity sewer. This would eliminate the need for several grinder pumps for the properties located between Flint Road and Prospect Street on Massachusetts Avenue. This option will be reviewed further in the preliminary design phase.

Spencer / Tuttle / Flint - The three cul-de-sacs located off Tuttle Road and Lothrop Road, specifically, Wayside Lane, Tuttle Drive, and Torrington Lane may require low pressure sewers to tie into the gravity sewers. Low pressure systems can consist of a single Town-owned system similar to PS #9 on Clover Hill Road or individually-owned units like High Street. These three low pressure sewers serving the cul-de-sacs will require approximately 13 grinder pumps and allow the STF area to be served by a single pump station. This alternative sites the pump station at the end of Flint Road. Lothrop Road will connect to this station via



The Opinion of Probable Costs Summary is included below. The detailed Cost Comparison of Alternatives table is attached.

Opinion of Probable Costs Summary*				
Direct Costs	WAC-1		STF-1	
	Low	High	Low	High
Conceptual Construction Costs	\$3,382,000	\$3,865,000	\$3,769,000	\$4,307,000
Indirect Costs				
Design & Permitting (10% of Construction)	\$338,200	\$386,500	\$376,900	\$430,700
Procurement & Constr. Engineering (15%)	\$507,300	\$579,750	\$565,350	\$646,050
Administration (Police, Financing, Legal, etc. - 10%)	\$338,200	\$386,500	\$376,900	\$430,700
Indirect Contingency - 5%		\$193,250		\$215,350
Subtotal Indirect Costs	\$1,184,000	\$1,546,000	\$1,319,000	\$1,723,000
Total Project Conceptual Costs Low	\$4,566,000	\$5,411,000	\$5,088,000	\$6,030,000
Estimated SBUs	130	100	130	120
Conceptual Project Costs per SBU*	\$35,000	\$54,000	\$39,000	\$50,000

* ENR Construction Cost Index = 8,094 (February 2008)

** Conceptual project costs may not represent actual sewer betterment fees

Soil contamination issues and other non-listed cost impacts are not included in this Opinion of Probable Costs for Sewer Extension.

Sincerely,

WOODARD & CURRAN INC.

Jack Troidl, P.E.
Project Engineer

JCT/lis
Project No. 212761

Enclosure(s)

cc: Joe Shea, Vice President, Woodard & Curran

Table 1: West Acton Sewer Extension Project - Cost Comparison of Alternatives						
Items	Unit	Unit Cost	Alt. 1: WAC-1		Alt 5: STF-1	
			Quantity	Cost	Quantity	Cost
Direct Costs						
8" PVC Sewer (8-12 feet)	L.F.	135	2535	\$342,225	7260	\$980,100
8" PVC Sewer (12-16 feet)	L.F.	150	1065	\$159,750	2140	\$321,000
8" PVC Sewer (16-20 feet)	L.F.	180	50	\$9,000	600	\$108,000
8" PVC Sewer (>20 feet)	L.F.	220	0	\$0	0	\$0
6" PVC Service Stubs (40 lf each)	L.F.	85	3160	\$268,600	5080	\$431,800
PVC Forcemain	L.F.	60	4900	\$294,000	4000	\$240,000
PVC Low Pressure Sewer	L.F.	70	2650	\$185,500	850	\$59,500
Paving - Trenches in Local Streets (3" depth)	Sq Yd.	15	1,914	\$28,717	10,198	\$152,967
Paving - Trenches In State Roadway (3" depth)	Sq Yd.	15	3,356	\$50,333	0	\$0
Paving - CDF in Local Roads	Cu.Yd	110	0	\$0	1,000	\$110,000
Paving - CDF in State Roads	Cu.Yd	110	3,461	\$380,722	0	\$0
Paving - Overlay Local Roads (3")	Sq Yd.	10	6,933	\$69,333	31,344	\$313,444
Paving - Overlay State Roads (3")	Sq Yd.	10	14,733	\$147,333	0	\$0
Water Main Relocation (15% total sewer l.f.)	L.F.	85	945	\$80,325	1,628	\$138,338
Drainage Pipe Relocation (5% total sewer l.f.)	L.F.	50	315	\$15,750	543	\$27,125
Ledge Removal (10% total sewer l.f. in ledge)	Cu. Yd.	85	1,366	\$117,810	2,387	\$202,895
Grinder Pumps	Each	4,200	17	\$71,400	13	\$54,600
Pump Stations	Each	400,000	2	\$800,000	1	\$400,000
Easements	L.F.	100	0	\$0	500	\$50,000
Stream and/or Railroad Crossings	Each	200,000	1	\$200,000	0	\$0
Construction Contingency Low - 5%	--	5%		\$161,040		\$179,488
Subtotal - Conceptual Construction Costs Low				\$3,382,000		\$3,769,000
Subtotal - Conceptual Construction Costs High				\$3,865,000		\$4,307,000
Indirect Costs						
Design & Permitting (10% of Construction)	Des. Cost	10%	--	\$338,200	--	\$376,900
Procurement & Constr. Engineering (15%)	Con. Cost	15%	--	\$507,300	--	\$565,350
Administration (Police, Financing, Legal, etc. - 10%)	Con. Cost	10%	--	\$338,200	--	\$376,900
Indirect Contingency - 5%	Ind. Cost	5%	--	\$193,250	--	\$215,350
Subtotal - Conceptual Indirect Costs Low				\$1,183,700		\$1,319,150
Subtotal - Conceptual Indirect Costs High				\$1,546,000		\$1,722,800
Total Project Conceptual Costs Low				\$4,566,000		\$5,088,000
Total Project Conceptual Costs High				\$5,411,000		\$6,030,000
Total LF of Collection Sewer (LF)				\$6,300		\$10,850
\$/Ft of Sewer Low				\$725		\$469
\$/Ft of Sewer High				\$859		\$556
Estimated SBUs Low			100		120	
Estimated SBUs High			130		130	
Sewers1 (x1000 ft)			6.3		10.9	
SBU Density Low (SBUs per 1000 LF of sewer)			15.9		11.1	
SBU Density High (SBUs per 1000 LF of sewer)			20.6		12.0	
Conceptual Construction Costs per SBU Low			\$35,000		\$39,000	
Conceptual Construction Costs per SBU High			\$54,000		\$50,000	
Estimated Flow (5-year winter flow average)	GPD		17,081		20,668	
Title 5 Flows	GPD		54,925		49,610	
ENR Construction Cost Index (February 2008)			8,094			



The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street, Boston, MA 02202

ARGEO PAUL CELLUCCI
GOVERNOR
TRUDY COXE
SECRETARY

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<http://www.magnet.state.ma.us/envir>

December 1, 1998

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ESTABLISHING A SPECIAL PROCEDURE
FOR MEPA REVIEW

PROJECT NAME : Comprehensive Wastewater
Management Plan
PROJECT MUNICIPALITY : Acton
PROJECT WATERSHED : Assabet
EOEA NUMBER : 11781
PROJECT PROPONENT : Town of Acton
DATE NOTICED IN MONITOR : October 25, 1998

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and Sections 11.03 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project requires the preparation of an Environmental Impact Report (EIR). Furthermore, pursuant to Section 11.09 of the MEPA Regulations, I hereby establish a special procedure for review of the required EIR.

This project involves the development of a town-wide wastewater management plan for the Town of Acton. The Town has previously developed Wastewater Management/Facilities Plans and these resource materials should be useful in preparing the required Environmental Impact Report.

The Town has requested that a portion of the sewerage project, described in the Environmental Notification Form as Middle Fort Pond Brook Sewer Project, which includes portions of South Acton and Kelley's Corner, be allowed to proceed prior to completion of the overall environmental review for the wastewater management planning process. The areas in question currently have problems meeting the provisions of Title 5 and are among the more densely developed areas of the community.

The Middle Fort Pond Brook Project involves the installation of slightly less than 10 miles of new sewers and the construction of a new sewage treatment facility with a groundwater discharge

at the Adams Street site. The town has prepared a geohydrologic analysis for the discharge site that clearly shows that disposal of up to 250,000 gallons per day of highly treated effluent can be accommodated without significant threat of adverse environmental impact. Most of the sewer installation will be within existing public ways, which minimizes the potential for adverse impacts from the installation of those sewers. I find that the need for this portion of the project has been shown and that the permitting process with the Department of Environmental Protection will provide the design details necessary to ensure protection of the environment.

Based on my review of that information, I will allow the Town to proceed with that portion of the project, described above, outside of the MEPA review for the overall project, as requested. While I am not requiring further specific environmental review of this portion of the project, I expect that the flows from this area will be included in the analyses that are prepared during the overall environmental review.

A special procedure for review of the EIR/Facilities Plan is appropriate in this case because the Town can save both time and money through a process that focuses the problems and solutions more effectively than the standard MEPA review. The following procedure is based on discussions with the Town and its engineering consultants as well as the Department of Environmental Protection (DEP). It provides for a phased review beginning with a town-wide needs and growth management analysis (Phase I) and subsequent filings of Expanded ENFs (Section 11.05(7) of the MEPA Regulations) for subsequent phases.

Consequently, I am not issuing a detailed scope for all phases of the EIR at this time. This Certificate contains the scope for the Phase I report and a general description of the requirements for future phases.

SPECIAL PROCEDURE

The EIR process will consist of the filing of several
documents. Phase I will consist of a Needs and Growth Management Analysis covering the entire town and subsequent phases will be filed individually under the umbrella of the Phase I document. The filing under each Phase will thoroughly examine the issues associated with its respective Phase.

Each document will be distributed and reviewed according to the review procedures identified in Section 11.07 of the MEPA Regulations, EIR Preparation and Filing, including a 30 day public comment period and 7 days for the Secretary to issue a decision on adequacy.

PHASE I - NEEDS AND GROWTH MANAGEMENT

The Town has collected and analyzed considerable data on needs that should be reported in the Phase I document. The needs analysis should identify existing wastewater problems, their causes, and the geographic area over which they occur. The analysis should be based on as much empirical data as is available, or can reasonably be developed. Such data may include existing wastewater flows, septage volumes, pumping records and the like.

The analysis should result in a definition of specific service areas for application of wastewater disposal measures. It is important to note that these determinations should, in the first instance, be made independent of what measures might be available to reduce water use and subsequent demand. The analysis should specifically document the need for each disposal measure by geographic area and land use type, including a reasonable projection of growth through the design year.

In addition, the Phase I report should present an analysis that begins to take into account measures that have the potential for reducing wastewater volumes, and adjust the needs analysis accordingly. The report should address the feasibility and effectiveness of such measures and should, at a minimum, include a preliminary water demand management and conservation plan. The MEPA office has reviewed such conservation plans in the recent past that could serve as examples and I recommend consultation with the MEPA staff on this matter.

Executive Order #385 requires that state and local agencies engage in proactive and coordinated planning oriented towards both resource protection and sustainable economic development. For reasons both of environmental protection and fiscal prudence, investments in public infrastructure should be carefully targeted toward those areas for which clear existing need has been established and for areas where denser development is appropriate, thereby relieving development pressures on open space, agricultural lands, and other valuable natural resources.

The Phase I Report should identify the land uses in those areas that are determined to need collection systems, and compare the potential secondary growth impacts that may be induced by public sewers with local and regional growth management policies. If the Town has a current local comprehensive plan in place, the Phase I Report may refer to that plan's identification of priority areas for growth and development, and for open space and farmland preservation. Otherwise, that degree of planning for growth should be carried out directly as part of the Phase I Report. I encourage the proponent to consult with DEP and the Growth Management Policy staff at the Executive Office of Environmental Affairs as it develops its growth management strategy.

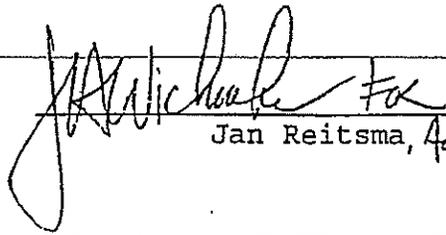
SUBSEQUENT PHASE REPORTS

Subsequent phases of the project should be reviewed beginning with the filing of an Expanded ENF, as defined in the MEPA Regulations. This filing should identify the need for corrective measures and growth management strategies, as determined in the Phase I report, and should assess the alternatives available for correcting the reported problems. The alternatives considered should include the full range of options available and each should be screened to determine which alternative can address the problems in the most environmenally sensitive and economical manner.

Environmental resources in the area of the project should be identified and an assessment can be made of the potential impacts to those resources.

Based on the information submitted for each phase, I will make an assessment as to whether an EIR is required at all, if a Single EIR (Section 11.06(8) of the MEPA Regulations) is appropriate, or if a Draft and Final EIR is required.

December 1, 1998
Date


Jan Reitsma, Acting Secretary

Date

Town of Acton

Comments received :

Department of Environmental Protection
Massachusetts Historical Commission
Massachusetts Highway Department
Metropolitan Area Planning Council
National Park Service
Organization for the Assabet River

DRAFT



APPENDIX B: CWNS PROJECT NUMBER 1001 DOCUMENTATION

Massachusetts Category 5 Waters "Waters requiring a TMDL"

NAME	SEGMENT ID	DESCRIPTION	SIZE	POLLUTANT NEEDING TMDL [EPA APPROVAL DATE-DOCUMENT CONTROL NUMBER]
Assabet River (8246775)	MA82B-03_2008	From the Route 20 Dam, Northborough to the Marlborough West WWTP discharge, Marlborough.	2.4 miles	-Nutrients [9/23/2004-CN201.0] -Pathogens -Taste, odor and color -Noxious aquatic plants -(Exotic species*) -(Objectionable deposits*)
Assabet River (8246775)	MA82B-04_2008	From the Marlborough West WWTP discharge, Marlborough to the Hudson WWTP discharge, Hudson.	8.0 miles	-Cause Unknown -Metals -Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Pathogens -Noxious aquatic plants [9/23/2004-CN201.0]
Assabet River (8246775)	MA82B-05_2008	From the Hudson WWTP discharge, Hudson to the USGS gage at Routes 27/62, Maynard.	8.2 miles	-Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Pathogens -Taste, odor and color -Noxious aquatic plants -(Exotic species*) -(Objectionable deposits*)
Assabet River (8246775)	MA82B-06_2008	From the USGS gage at Routes 27/62, Maynard to the Powdermill Dam, Acton.	1.2 miles	-Priority organics -Metals -Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Thermal modifications -Taste, odor and color -Noxious aquatic plants [9/23/2004-CN201.0] -(Exotic species*) -(Objectionable deposits*)
Assabet River (8246775)	MA82B-07_2008	From the Powdermill Dam, Acton to the confluence with the Sudbury River, Concord.	6.4 miles	-Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO <9/23/2004-CN201.0> -Pathogens
Assabet River Reservoir (82004)	MA82004_2008	Westborough	338 acres	-Metals [12/20/2007-NEHgTMDL] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Noxious aquatic plants -Turbidity -(Exotic species*)
Carding Mill Pond (82015)	MA82015_2008	Sudbury	40.5 acres	-Nutrients -Noxious aquatic plants -(Exotic species*)
Lake Cochituate (82020)	MA82020_2008	[North Basin] Natick/Framingham/Wayland	196 acres	-Priority organics -Organic enrichment/Low DO -(Exotic species*)
Lake Cochituate (82125)	MA82125_2008	[Middle Basin] Natick/Wayland	135 acres	-Priority organics -Organic enrichment/Low DO -Pathogens -(Exotic species*)

**COMPREHENSIVE WATER RESOURCES
MANAGEMENT PLAN/ENVIRONMENTAL
IMPACT REPORT PHASE I
EXISTING CONDITIONS, FUTURE
REQUIREMENTS AND PROBLEMS
IDENTIFICATION (DEFINITION OF NEEDS)
ACTON, MASSACHUSETTS**

Environmental Engineers/Consultants

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Engineering • Science • Operations

980 Washington Street, Suite 325
Dedham, MA 02026
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June 2004

Additionally, the recent Wellhead Protection Study (2002) identified 47 septic systems over 2,000 gpd in Zone IIs that may impact water quality. These septic systems are included in the Acton Water District's GIS database available to the Town.

6.7 AREAS IN NEED OF OFF-SITE WASTEWATER SOLUTIONS

Figures 6-2 and 6-3 illustrate the probable grouping of the needs areas resulting from the needs assessment. Identified in the figures are:

- Parcels requiring offsite solutions,
- Parcels requiring mounded systems, and
- Large septic systems.

Lots identified as requiring offsite solutions to wastewater disposal problems are dispersed throughout the community. Attempting to service only the dispersed lots with off-site solutions would be technically impractical and cost prohibitive. Grouping "needs" lots geographically is more feasible technically and financially. Still, wastewater infrastructure constructed to serve the "needs" lots will also create links to other adjacent lots, creating potential service areas. Therefore, preliminary service/study areas have been developed that link nearby "needs" lots with lots not exhibiting pending needs.

All the identified "needs" parcels require offsite solutions. Therefore, each area reflects the same priority as determined by the methodology presented in this report. However, the order in which the Town addresses the needs areas may be developed by several methods including assigning the highest priority to the largest needs areas first or by prioritizing the needs areas that lend themselves to solving the wastewater disposal problem most quickly and inexpensively.

Figure 6-2 displays the minimum study areas based on combining closely grouped areas determined to require off-site solutions. Lots adjacent to the "needs" lots are also included to maximize the cost-effectiveness of the system. The table included with the figure lists the number of parcels in the study area and the expected wastewater flow from each parcel grouping. Total estimated flow from the minimum study areas is approximately 110,000 gallons per day.

Figure 6-3 displays the maximum study areas based on combining closely grouped areas requiring off-site solutions and adjacent parcels requiring mounded systems. Total estimated flow from the maximum study areas is approximately 265,000 gallons per day. There are several other areas where mounded systems will most likely be required but the analysis has not identified these areas as requiring off-site solutions.

FIGURE 6-2: MINIMUM SERVICE AREAS

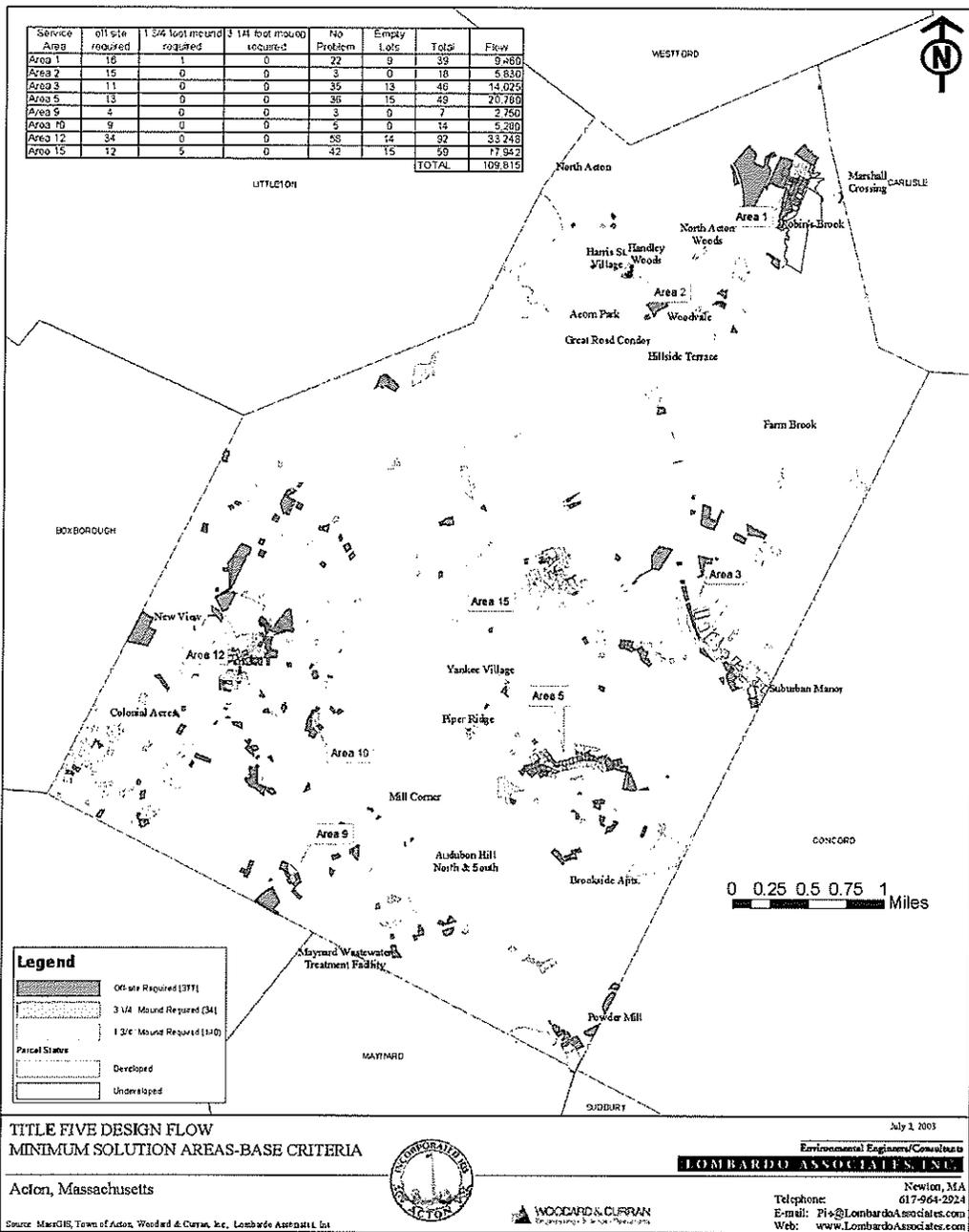
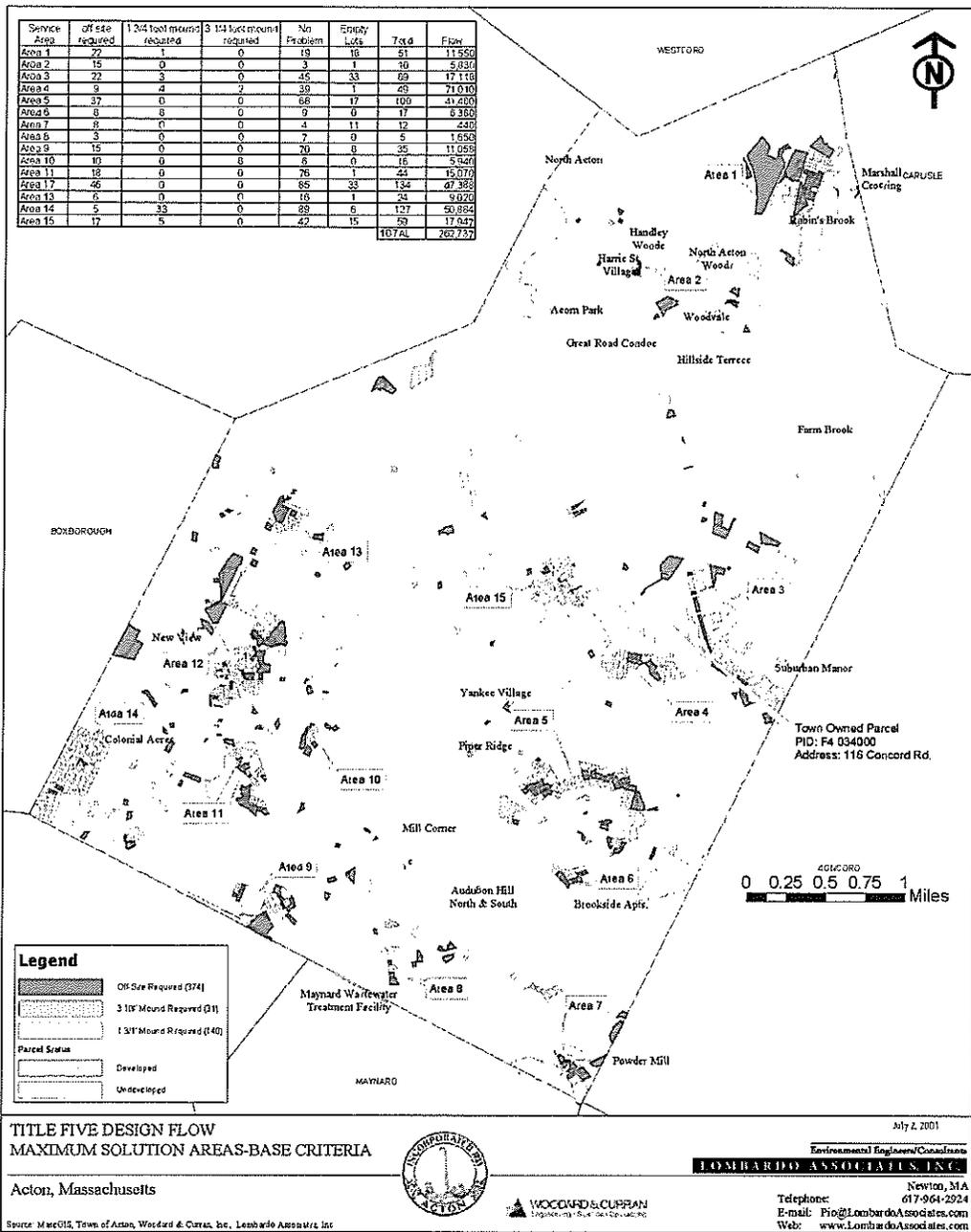


FIGURE 6-3: MAXIMUM SERVICE AREA



The grouping of study areas are the result of the GIS and database analysis of the needs criteria, interviews with town staff, CAC input, field review, and literature research. These groupings form a framework for discussing and evaluating the minimum and maximum number of parcels included in off-site systems. The boundaries of these areas will be refined and the requirement for off-site solutions will be reviewed in conjunction with potential treatment and disposal options in the next phase of the planning process.

6.8 POTENTIAL SATELLITE WASTEWATER DISPOSAL LOCATIONS

6.8.1 Introduction

The principal tool used in identifying Areas of Interest (AOI's) with potential for wastewater disposal has been the database available from the Town of Acton's GIS system and data from MassGIS. These data bases have allowed the important and limiting characteristics of soil type, such as depth to groundwater, and level of development to be combined in eliminating all areas of the Town which are inappropriate for further consideration.

All evaluations of areas eliminated or included under the various criteria below were conducted on a parcel base map available from the Acton GIS system. Physical characteristics of parcels, the areas of parcels and linking to the developed status for each parcel were carried out using GIS tools.

6.8.2 Criteria

Soil Type

The most significant characteristic in eliminating portions of Town unsuitable for wastewater effluent disposal is soil type. Areas without water-lain deposits of sands and gravels are not expected to be able to infiltrate wastewater effluent quickly enough to be of value in a small municipal disposal program. Thus areas without these soil characteristics are eliminated from consideration.

Seasonal High Groundwater

Another significant hydrogeologic characteristic for wastewater disposal is the depth to seasonal high groundwater. MA DEP regulations require a minimum of four feet of unsaturated soils below the wastewater effluent discharge facility, after any groundwater mounding has occurred. As an initial criterion, to allow for limited mounding and some embedment of the facility, areas with 6 feet or less to seasonal high groundwater are rejected. This criteria may be revisited in subsequent phases if a parcel is identified that meets all other criteria and would benefit from some effort in adding soil to increase the surface elevation above the groundwater level.

Developed land

Development or building on parcels, particularly residential development on small lots, is not desirable when selecting wastewater effluent disposal locations due to potential disruption of residents during construction and frequent resistance and concern about having a nearby facility. Thus an initial evaluation is to eliminate all but vacant parcels.

However, an additional analysis was conducted at the request of the CAC and Health Department. The CAC identified several parcels that are largely unused, with one or a few buildings, on large lots. The Health Department identified additional lots based on knowledge of the local soils and groundwater. The

**Comprehensive Water Resources Management
Plan (CWRMP) – Phase 2**

Volume 1 of 5

Town of Acton, MA

**March 2006
Revised June 2006**



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2.3 EVALUATION CRITERIA

A main component of the Phase 1 process was the assessment of the need for alternative wastewater disposal other than continued reliance on conventional onsite wastewater systems. A maximum of 15 Needs Areas were identified. Figure 1-2 shows the location of the following Needs Areas.

1. Marshall Crossing / Robbins Brook / North Acton Village
2. Nagog Woods / Acorn Park / North Acton Woods
3. East Acton Village / Route 2A
4. Concord Road / Robbins Park
5. Brucewood Estates
6. Brookside Apartments/Circle
7. Powdermill Plaza
8. Maynard border / South Main Street
9. Heath Hen Meadow / Billings and Stow Streets
10. Spencer Road and Tuttle/Flint/Mallard neighborhood
11. Nash and Downey Roads / Dover Heights
12. West Acton Center
13. Indian Village
14. Flagg Hill
15. Acton Center (Town Hall) / Patriot's Hill

2.3.1 Needs Areas Development

The Needs Areas were developed through the evaluation of technical and non-technical criteria in a multi-step process involving an interactive dialogue between the Project Team and a very involved CAC. Phase 1 included the first two steps, with Phase 2 picking up with Step 3.

2.3.1.1 Phase 1 Needs Areas Development

Step 1 – Identify Needs in Acton

Areas in need of wastewater disposal solutions are identified. The data from the BOH records, CAC input, previous reports and studies, surface water and groundwater sampling, and local regulations and bylaws form the basis for the analysis of the “needs”. Potential technical alternatives for wastewater collection, treatment, disposal and management are evaluated for application in Acton.

Step 2 – Create Needs Areas

Needs Areas are created based on the technical evaluation and on “non-technical” parameters. Technical criteria include regulatory setback requirements, design parameters, and data on special designs from Board of Health (BOH) records. The CAC reviewed the technical information and provided anecdotal



evidence to complement the technical criteria. Table 2-1 lists the technical criteria evaluated as part of Phase 1, Step 2.

Table 2-1: Technical Criteria for Phase 1

Regulatory Minimum Setbacks	Design Parameters / BOH Data
• Property Line	• Percolation Rate
• Buildings	• Depth to Groundwater
• Wetlands	• Depth to Bedrock
• Floodplains	• Mounded Construction
• Surface Water	• Variances
• Public Well	• Special Technologies (I/A, etc.)
• Private Well	
• Vernal Pools	

Table 2-2 presents the Non-Technical Criteria evaluated as part of Phase 1, which include items raised by the CAC. The non-technical criteria process was used to verify the selection of technical Needs Areas and ensure that the community's entire needs were considered.

Table 2-2: Non-Technical Criteria for Phase 1

Non-Technical Criteria	
• Aesthetics (mounded systems, tree removal, etc.)	• Location of human sensitive receptors
• Neighborhood character – maintain the rural nature of Acton	• Potential to link solution to other opportunities
• Consistency with other town plans	• Regulatory pressure
• Growth – in designated areas	• Ability to implement solution given location, costs, etc
• Archeological and historical impacts	• Costs
• Optimization of existing sewer system	• Protection of environment (wetlands, groundwater, etc)

The CAC recognized that potential solutions are inextricably linked to the criteria that determines Needs Areas and therefore considered the potential to link the solution to other opportunities, such as rail trail construction, as needs criteria for evaluation.

The Project Team presented potential technological solutions to the CAC for evaluation. In-town locations for disposal facilities were identified through an evaluation similar to the needs assessment by searching for publicly owned property and large tracts of private land with favorable soils located outside of sensitive resource areas. Table 2-3 presents the technology alternatives for solutions and the criteria for assessment for disposal sites conducted as part of Phase 1.



Table 2-3: Technology Alternatives and Disposal Site Evaluation

Preliminary Technology Evaluation	Disposal Site Evaluation
<ul style="list-style-type: none">• Onsite	<ul style="list-style-type: none">• Percolation rate (soils type)
<ul style="list-style-type: none">• Clusters	<ul style="list-style-type: none">• Depth to groundwater
<ul style="list-style-type: none">• Decentralized	<ul style="list-style-type: none">• Depth to bedrock
<ul style="list-style-type: none">• Centralized in-town	<ul style="list-style-type: none">• Sensitive human receptors
<ul style="list-style-type: none">• Centralized regional	<ul style="list-style-type: none">• Sensitive environmental receptors
	<ul style="list-style-type: none">• Well impacts
	<ul style="list-style-type: none">• Proximity to Needs Areas
	<ul style="list-style-type: none">• Availability of land

Potential disposal locations are identified through analysis of the technical criteria and by applying the “non-technical” criteria in a method similar to the process used to create Needs Areas.

2.3.1.2 Phase 2

Phase 2 of the CWRMP began with Step 3, in which the CAC finalized the criteria for each Needs Area.

Step 3 – Create Needs Planning Areas

The CAC began the Phase 2 process by assessing the Needs Area groupings developed in Phase 1. The areas were refined based on topography, underlying geology, and socio-economic factors, such as traditional neighborhood boundaries and planned economic growth areas. Figure 2-2 shows the Needs Planning Areas (Areas). The Areas are deliberately large to capture environmental similarities within the Areas, and encompass entire neighborhoods that traditionally may be perceived as single entities. Final solutions may encompass the entire Needs Planning Area or portions of the Areas depending on the needs and a final evaluation prior to program implementation.

Step 4 – Finalize Criteria Ranking

The CAC agreed the Needs Planning Areas identified at this point are in need of new solutions from a technical needs viewpoint. The CAC agreed that all of the technical criteria addressed environmental concerns and are therefore of equal rank, but some “non-technical” criteria are more important than others.

Priority non-technical criteria that address potential solutions include implementability; growth, especially economic growth in areas designated for growth; optimization of the current wastewater infrastructure and wastewater treatment facility (WWTF); and reclaimed water use and recharge of groundwater/aquifers. These criteria are not explicitly attached to specific Areas; rather they are primary, or overriding, criteria for all Areas. A summary of the CAC’s input on important non-technical criteria is:



1. Implementability

Implementability includes of the feasibility of a technical solution, probability of permitting, considerations such as addressing the areas initially planned to be part of an expanded sewer district as part of the Middle Fort Pond Brook system, and local residents' perceptions.

The availability of implementable solutions governs the final recommended solutions. Often a Needs Planning Area will have multiple technical solutions. But, when considering potential solutions, political, financial and popular opinions play a role. The CAC concluded that implementability also meant the ability to convince Town Meeting that the recommended plan is the correct plan, especially considering that residents who were included in the initial plans for an expanded sewer district may not be served under the CWRMP's framework.

The timeline for implementation is also important because of the timing of related projects. The CAC would like to see structural solutions link to other opportunities such as rail trail construction and recreation field development. In addition, pressure from regulatory agencies to solve specific current, potential, or pending, problems may drive the solutions at a schedule different from the CWRMP implementation schedule.

2. Growth

Potential economic growth areas include West Acton Center/Village (Area 12) and East Acton Village (Area 3) extending along Route 2A. The village areas in particular have developed special planning documents and zoning that target the villages for economic growth, but in character with the existing mixed-use environment.

Secondary growth impacts (positive and negative) should be evaluated if expanded wastewater disposal capacity, such as sewerage, is considered in a village area.

Needs Planning Areas

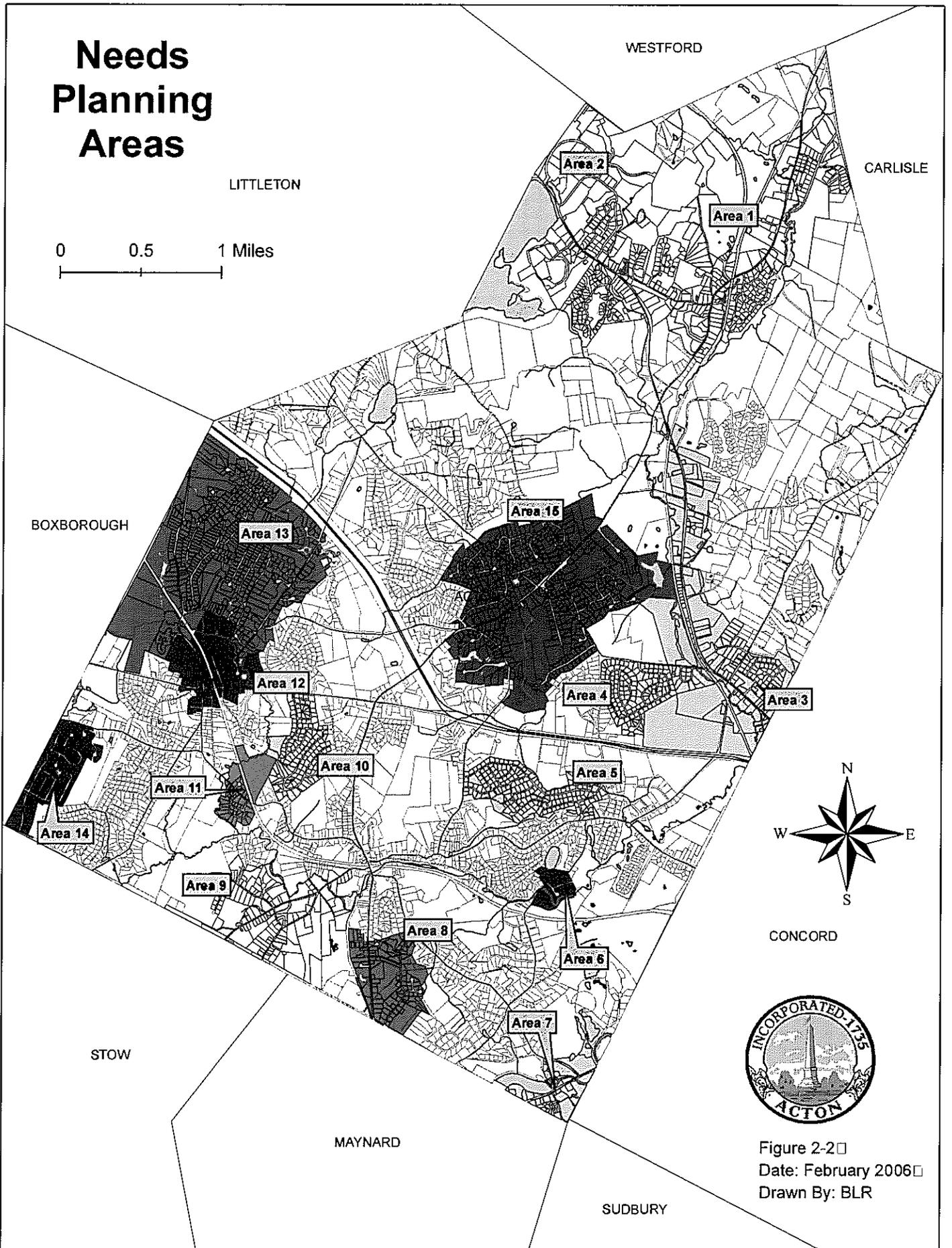


Figure 2-2 □
Date: February 2006 □
Drawn By: BLR



3. Optimization

Optimization of the current wastewater infrastructure and treatment facility, which may include connecting as many properties as possible to fully use the pipes, pump stations and treatment facility may achieve an economy of scale. The CAC agreed that if additional sewerage is developed, the infrastructure should address the Needs Areas as the priority. Solutions should be linked to lots that actually need a solution, not conveniently connecting contiguous properties while leaving out a nearby Needs Area, even if more expensive.

4. Reuse/recharge

Use and recharge of reclaimed water, whether treated wastewater or stormwater, includes finding disposal locations within Acton to recharge the local aquifer instead of seeking a surface water discharge. The existing sewer collection and treatment facilities could be used in conjunction with subsurface discharge locations located some distance from the treatment facility. Other satellite treatment and disposal systems could be located in areas that may recharge aquifers. Wastewater effluent discharge for the purpose of recharging drinking water aquifers may also be a long-range option.

Acton, as a NPDES Phase II community, is undertaking programs to control, manage, and treat stormwater runoff. Acton's S.319 grant addressed the difficulty of siting end-of-pipe treatment and recommended on-site controls. Infiltration in particular can benefit local aquifers. Low Impact Development (LID) is one technique that addresses stormwater at its source instead of through end-of-pipe solutions. Increased infiltration and runoff control is being addressed through development of Acton's post-construction runoff control bylaw.

Step 5 – Rank Needs Planning Areas

Once the criteria were established and finalized, the CAC identified the criteria most important to each Area through discussion of each criteria for each Needs Area. Next the Areas were prioritized through discussion and vote, followed by prioritization of solutions, again through discussion and vote for each Area. The next section presents a detailed discussion of the alternatives assessment process.

2.4 EVALUATION OF ALTERNATIVES

The CAC meeting process from June 2004 through April 2006 provides the road map to the evaluation of alternatives. During these meetings, the Project Team and CAC evaluated and ranked each alternative solution for each Needs Planning Area. Meeting minutes and public outreach material are compiled in Appendix B.

The CAC set some general limits to the feasibility of potential solutions. Generally, extending the existing collection system for Areas north of Route 2 or construction of new collection and treatment systems for Areas adjacent to the existing collection system are considered not feasible.

The CAC prioritized the needs criteria in each Area and then prioritized the Areas. Potential solutions were identified that addressed the needs criteria and resolved environmental and public health concerns. The CAC then ranked the solutions, identifying preferred solutions for each Area that reflected the community's goals for each area and addressed the primary criteria of implementability, economic growth, optimization, and reuse/recharge.



creation of a final plan. The feasibility study can start as soon as Town Meeting appropriates funds, or as soon as funding (grant) opportunities are available. The town has submitted requests for the development of similar programs to several funding programs (s.319, 604b, CZM) without success. Therefore, the town should appropriate funds in fall 2006 to develop the framework of Wastewater Management Districts in Acton. The process should be complete within one year of the appropriation with active citizen involvement.

3.3 SUMMARY OF THE RECOMMENDED PLAN

3.3.1 Long-Term Recommendations

Figure 3-4 presents the visual guide to the final recommendations. It includes West Acton Center-A in the recommendations for sewer extension with West Acton-B included under a Wastewater Management District. Final capacity availability and wastewater flows will be determined as part of a preliminary design phase and ENF process associated with the recommended solution. Table 3-7 contains the primary recommendations and provides the menu of other viable alternatives available to each Area.

Sewer Extensions

- Powdermill Plaza / High Street (Area 7) – The CWRMP concurs with the Town’s decision to move forward with sewer construction
- Spencer/Tuttle/Flint (Area 10)
- West Acton Center-A (Area 12)

Cluster (Public/Private)Systems

Areas recommended for cluster system solutions could also be included in Wastewater Management Districts if cluster systems are not implementable or wastewater management could be implemented in conjunction with cluster systems.

- Marshall Crossing / Robbins Brook (Area 1)
- Nagog Woods/ Acorn Park / North Acton Woods (Area 2)
- East Acton Village (Area 3)
- Brookside Circle (Area 6)
- Nash and Downey Roads / Dover Heights (Area 11)

Wastewater Management Districts

- Robbins Park (Area 4)
- Brucewood Estates (Area 5)
- Maynard Border (Area 8)
- Heath Hen Meadow (Area 9)
- West Acton Center-B (Area 12)
- Indian Village (Area 13)
- Flagg Hill (Area 14)
- Acton Center (Area 15)

Recommended Solutions For Needs Planning Areas

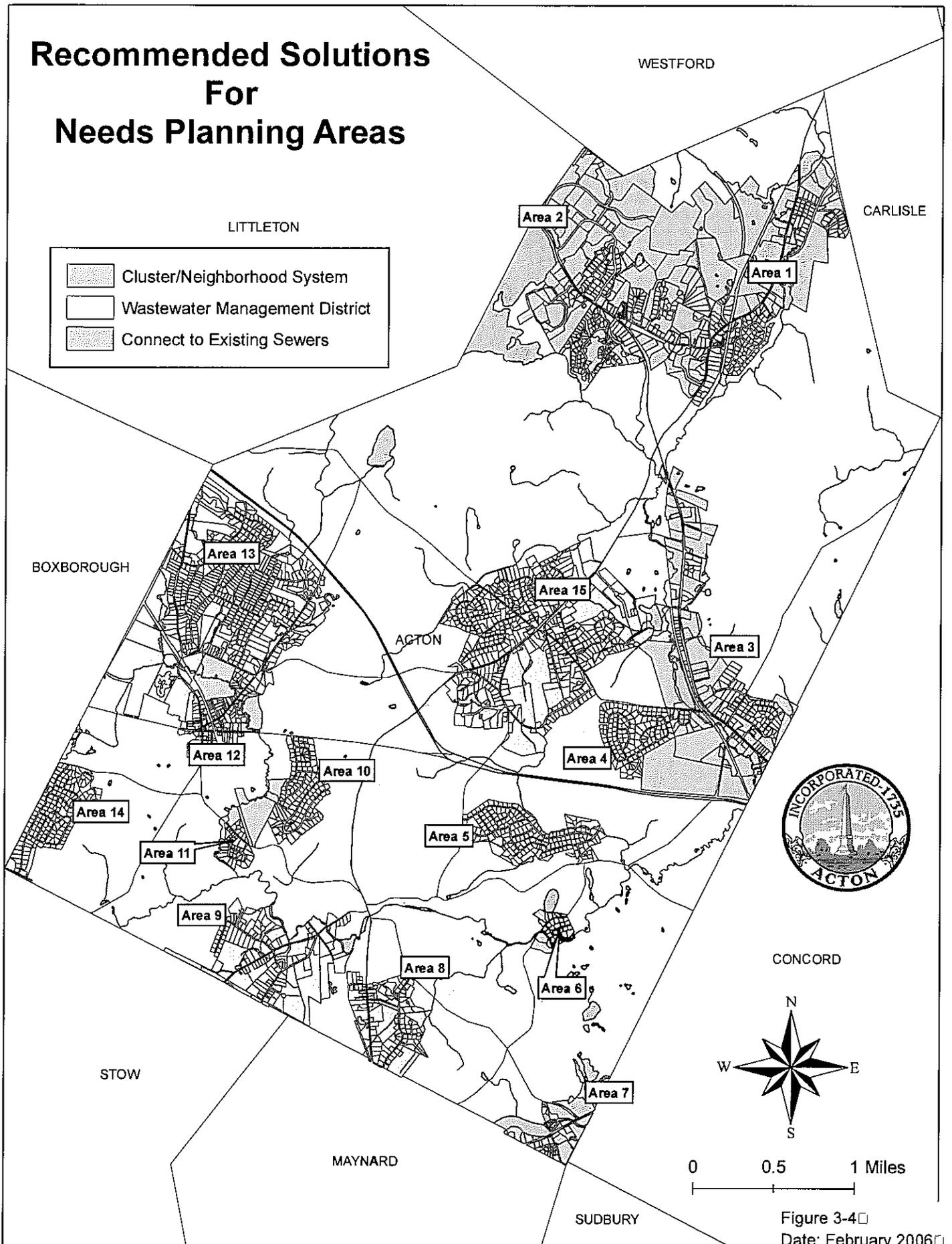




Table 3-7: Recommended Solutions Matrix

Needs Area #	Description	Current Priority Status	Rank (1-4) with 1 being the recommended choice (NA = Not Applicable)			
			Connect to Existing Sewers	Construct New WWTF/Sewers	Cluster System	Wastewater Management District
1	North Acton Village Marshall Crossing Robbins Brook	Medium	NA	3	1	2
2	Nagog Woods Acorn Park North Acton Condos	Low	NA	2	1	NA
3	East Acton Village Route 2A	High	NA	2	1	3
4	Concord Road Robbins Park	Low	NA	2	3	1
5	Brucewood Estates	Medium	3	NA	2	1
6	Brookside Circle	Low	3	NA	1	2
7	Powdermill Plaza	High	1	NA	NA	NA
8	Maynard Border	Medium	2 Maynard or Acton	NA	3	1
9	Heath Hen Meadow / Stow Street	Low	3	NA	2	1
10	Spencer / Tuttle / Flint	High	1	NA	NA	2
11	Nash / Downey Dover Heights	Medium	NA	NA	1	2
12	West Acton Center – A	High	1	NA	2	3
12	West Acton Center – B	High	2	NA	3	1
13	Indian Village	High	NA	3	2	1
14	Flagg Hill	Medium	NA	NA	2	1
15	Acton Center	Low	NA	2 - East Acton	3	1



Other Long-Term Recommendations

- Continue the surface and groundwater sampling program to integrate the programs with Wastewater Management Districts and monitor watershed health.
- Continue to monitor the advances and regulations regarding reclaimed water use in Massachusetts.
- Continue a proactive public outreach and participation program and coordinate efforts with the NPDES Phase II Stormwater Management Program and Acton Water District initiatives.

3.3.2 Short-Term Recommendations

- Develop a feasibility study for developing Wastewater Management Districts.
- Conduct a small scale pilot study of technologies for reclaimed water use once regulations provide guidance to treatment and discharge requirements.
- Appropriate funds in fall 2006 for final study and conceptual design of the Spencer / Tuttle / Flint and West Acton Center-A sewer extension, including public outreach and MEPA submittal.
- Appropriate funds in spring 2007 for design of Spencer / Tuttle/ Flint and West Acton Center-A solutions, and to submit a State Revolving Fund application for a construction loan.
- Submit an application for State Revolving Funds for construction of the Spencer / Tuttle / Flint and West Acton Center-A sewer extension in August 2007.
- Appropriate funds in spring 2008 for construction of the Spencer / Tuttle / Flint and West Acton Center-A sewer extension scope as determined through the conceptual and final design phases.
- Pursue legislative changes to the betterment rules to allow redistribution of betterment assessments for funding of the sewer projects.

3.4 ENVIRONMENTAL IMPACTS OF THE RECOMMENDED PLAN

The Recommended Plan is comprised of non-structural, private, and public structural solutions that will benefit the overall environmental health of Acton's water resources and reduce risks to public health. The recommended structural solution, extending sewers to High Street (Powdermill Plaza), and the Spencer/Tuttle/Flint area and West Acton Center-A, will have some temporary construction impacts from noise, dust, and traffic due to general excavation activities. However, new NPDES Phase II requirements to regulate construction site runoff are directed at mitigating short-term and long-term impacts of construction.

The recommended plan takes measures to minimize the environmental impact of construction activity through design, such as minimizing cross-country excavations and locating pump stations and other infrastructure away from resource areas, and during construction, such as requiring erosion control measures to control runoff impacts.

The recommended plan does not require additional disposal area or treatment facility construction. The Adams Street WWTF does not need alterations or expansion to accept and adequately treat and dispose of the wastewater. The sewer extension recommended for Spencer/Tuttle/Flint and West Acton Center-A would increase existing WWTF by over 10%, which triggers a MEPA threshold for an ENF submittal.

COMMITMENT & INTEGRITY
DRIVE RESULTS

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May 8, 2008

Doug Halley, Director of Health
Board of Health
Town of Acton
472 Main Street
Acton, MA 01720

RE: Letter Report
Design Basis Report for Sewer System Extension
Spencer/Tuttle/Flint & West Acton Center A
Acton, Massachusetts

Dear Mr. Halley:

The following letter report details the conceptual layout and preliminary engineering design requirements for the West Acton Center and Spencer, Tuttle, & Flint (STF) sewer extension project as recommended in the Feasibility Study and Conceptual Design Technical Memorandum dated March 26, 2008. The results of this study were presented at a public meeting to the Acton Water Resources Advisory Committee on March 12, 2008. (Woodard & Curran (W&C) presentation is attached). Once reviewed and validated by the Town of Acton, the detailed design phase will commence. This Design Basis Report is a more detailed discussion of the recommended scenario of alternatives which includes STF-1 and WAC-1. There is currently sufficient capacity at the Acton WWTP to receive flow from both of these selected project areas. If these two project areas are combined into one construction project, the project will benefit from cost savings from an economy of scale. A description of the two alternatives that make up this scenario is as follows:

West Acton Center - This alternative is similar to the conceptual layout in the Sewer Extension Proposal from July 2007. A pumping station on West Road will collect sewer flows from all of West Acton Center east of the railroad except for Massachusetts Avenue. This pump station will discharge to a gravity sewer near the final pump station along Massachusetts Avenue. This is the conservative approach including a pumping station at the end of West Road which may be excluded as discussed in the alternative below. The portion of Massachusetts Avenue on the west side of the Brook will gravity feed to the pump station. This final pumping station will discharge to the Massachusetts Avenue Sewer east of Prospect Street. This will include one river crossing. The portion of Massachusetts Avenue east of the river will consist of a low pressure sewer extending to the Massachusetts Avenue Sewer requiring approximately 17 grinder pumps. The sewers in this alternative are positioned within the roadway layout or on Town property, eliminating the need for any easements. The proposed layout is attached in Figure 1: Recommended Alternatives WAC-1 & STF-1.

An option for these alternatives exists along Massachusetts Avenue east of the Brook which will be served by low pressure sewers. If the STF area is sewerred first, this option would entail replacing a segment of the low pressure sewer by gravity sewers and connecting directly into the Flint Road gravity sewer. This would eliminate the need for several grinder pumps for the properties located between Flint Road and Prospect Street on Massachusetts Avenue. This option will be reviewed further in the preliminary design phase.

Spencer / Tuttle / Flint - The three cul-de-sacs located off Tuttle Road and Lothrop Road, specifically, Wayside Lane, Tuttle Drive, and Torrington Lane may require low pressure sewers to tie into the gravity sewers. Low pressure systems can consist of a single Town-owned system similar to PS #9 on Clover Hill Road or individually-owned units like High Street. These three low pressure sewers serving the cul-de-sacs will require approximately 13 grinder pumps and allow the STF area to be served by a single pump station. This alternative sites the pump station at the end of Flint Road. Lothrop Road will connect to this station via



The Opinion of Probable Costs Summary is included below. The detailed Cost Comparison of Alternatives table is attached.

Opinion of Probable Costs Summary*				
Direct Costs	WAC-1		STF-1	
	Low	High	Low	High
Conceptual Construction Costs	\$3,382,000	\$3,865,000	\$3,769,000	\$4,307,000
Indirect Costs				
Design & Permitting (10% of Construction)	\$338,200	\$386,500	\$376,900	\$430,700
Procurement & Constr. Engineering (15%)	\$507,300	\$579,750	\$565,350	\$646,050
Administration (Police, Financing, Legal, etc. - 10%)	\$338,200	\$386,500	\$376,900	\$430,700
Indirect Contingency - 5%		\$193,250		\$215,350
Subtotal Indirect Costs	\$1,184,000	\$1,546,000	\$1,319,000	\$1,723,000
Total Project Conceptual Costs Low	\$4,566,000	\$5,411,000	\$5,088,000	\$6,030,000
Estimated SBUs	130	100	130	120
Conceptual Project Costs per SBU*	\$35,000	\$54,000	\$39,000	\$50,000

* ENR Construction Cost index = 8,094 (February 2008)

** Conceptual project costs may not represent actual sewer betterment fees

Soil contamination issues and other non-listed cost impacts are not included in this Opinion of Probable Costs for Sewer Extension.

Sincerely,

WOODARD & CURRAN INC.


 Jack Troidl, P.E.
 Project Engineer

JCT/lis
 Project No. 212761

Enclosure(s)

cc: Joe Shea, Vice President, Woodard & Curran

Table 1: West Acton Sewer Extension Project - Cost Comparison of Alternatives						
Items	Unit	Unit Cost	Alt. 1: WAC-1		Alt 5: STF-1	
			Quantity	Cost	Quantity	Cost
Direct Costs						
8" PVC Sewer (8-12 feet)	L.F.	135	2535	\$342,225	7260	\$980,100
8" PVC Sewer (12-16 feet)	L.F.	150	1065	\$159,750	2140	\$321,000
8" PVC Sewer (16-20 feet)	L.F.	180	50	\$9,000	600	\$108,000
8" PVC Sewer (>20 feet)	L.F.	220	0	\$0	0	\$0
6" PVC Service Stubs (40 lf each)	L.F.	85	3160	\$268,600	5080	\$431,800
PVC Forcemain	L.F.	60	4900	\$294,000	4000	\$240,000
PVC Low Pressure Sewer	L.F.	70	2650	\$185,500	850	\$59,500
Paving - Trenches in Local Streets (3" depth)	Sq Yd.	15	1,914	\$28,717	10,198	\$152,967
Paving - Trenches in State Roadway (3" depth)	Sq Yd.	15	3,356	\$50,333	0	\$0
Paving - CDF in Local Roads	Cu.Yd	110	0	\$0	1,000	\$110,000
Paving - CDF in State Roads	Cu.Yd	110	3,461	\$380,722	0	\$0
Paving - Overlay Local Roads (3")	Sq Yd.	10	6,933	\$69,333	31,344	\$313,444
Paving - Overlay State Roads (3")	Sq Yd.	10	14,733	\$147,333	0	\$0
Water Main Relocation (15% total sewer l.f.)	L.F.	85	945	\$80,325	1,628	\$138,338
Drainage Pipe Relocation (5% total sewer l.f.)	L.F.	50	315	\$15,750	543	\$27,125
Ledge Removal (10% total sewer l.f. in ledge)	Cu. Yd.	85	1,386	\$117,810	2,387	\$202,895
Grinder Pumps	Each	4,200	17	\$71,400	13	\$54,800
Pump Stations	Each	400,000	2	\$800,000	1	\$400,000
Easements	L.F.	100	0	\$0	500	\$50,000
Stream and/or Railroad Crossings	Each	200,000	1	\$200,000	0	\$0
Construction Contingency Low - 5%	--	5%		\$161,040		\$179,488
Subtotal - Conceptual Construction Costs Low				\$3,382,000		\$3,769,000
Subtotal - Conceptual Construction Costs High				\$3,865,000		\$4,307,000
Indirect Costs						
Design & Permitting (10% of Construction)	Des. Cost	10%	--	\$338,200	--	\$376,900
Procurement & Constr. Engineering (15%)	Con. Cost	15%	--	\$507,300	--	\$565,350
Administration (Police, Financing, Legal, etc. - 10%)	Con. Cost	10%	--	\$338,200	--	\$376,900
Indirect Contingency - 5%	ind. Cost	5%	--	\$193,250	--	\$215,350
Subtotal - Conceptual Indirect Costs Low				\$1,183,700		\$1,319,150
Subtotal - Conceptual Indirect Costs High				\$1,546,000		\$1,722,800
Total Project Conceptual Costs Low				\$4,566,000		\$5,088,000
Total Project Conceptual Costs High				\$5,411,000		\$6,030,000
Total LF of Collection Sewer (LF)				\$6,300		\$10,850
\$/Ft of Sewer Low				\$725		\$469
\$/Ft of Sewer High				\$859		\$556
Estimated SBUs Low			100		120	
Estimated SBUs High			130		130	
Sewers1 (x1000 ft)			6.3		10.9	
SBU Density Low (SBUs per 1000 LF of sewer)			15.9		11.1	
SBU Density High (SBUs per 1000 LF of sewer)			20.6		12.0	
Conceptual Construction Costs per SBU Low				\$35,000		\$39,000
Conceptual Construction Costs per SBU High				\$54,000		\$50,000
Estimated Flow (5-year winter flow average)	GPD		17,081		20,668	
Title 5 Flows	GPD		54,925		49,610	
ENR Construction Cost Index (February 2008)			8,094			



The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street, Boston, MA 02202

ARGEO PAUL CELLUCCI
GOVERNOR
TRUDY COXE
SECRETARY

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<http://www.magnet.state.ma.us/envir>

December 1, 1998

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ESTABLISHING A SPECIAL PROCEDURE
FOR MEPA REVIEW

PROJECT NAME : Comprehensive Wastewater
Management Plan
PROJECT MUNICIPALITY : Acton
PROJECT WATERSHED : Assabet
EOEA NUMBER : 11781
PROJECT PROPONENT : Town of Acton
DATE NOTICED IN MONITOR : October 25, 1998

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and Sections 11.03 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project requires the preparation of an Environmental Impact Report (EIR). Furthermore, pursuant to Section 11.09 of the MEPA Regulations, I hereby establish a special procedure for review of the required EIR.

This project involves the development of a town-wide wastewater management plan for the Town of Acton. The Town has previously developed Wastewater Management/Facilities Plans and these resource materials should be useful in preparing the required Environmental Impact Report.

The Town has requested that a portion of the sewerage project, described in the Environmental Notification Form as Middle Fort Pond Brook Sewer Project, which includes portions of South Acton and Kelley's Corner, be allowed to proceed prior to completion of the overall environmental review for the wastewater management planning process. The areas in question currently have problems meeting the provisions of Title 5 and are among the more densely developed areas of the community.

The Middle Fort Pond Brook Project involves the installation of slightly less than 10 miles of new sewers and the construction of a new sewage treatment facility with a groundwater discharge

at the Adams Street site. The town has prepared a geohydrologic analysis for the discharge site that clearly shows that disposal of up to 250,000 gallons per day of highly treated effluent can be accommodated without significant threat of adverse environmental impact. Most of the sewer installation will be within existing public ways, which minimizes the potential for adverse impacts from the installation of those sewers. I find that the need for this portion of the project has been shown and that the permitting process with the Department of Environmental Protection will provide the design details necessary to ensure protection of the environment.

Based on my review of that information, I will allow the Town to proceed with that portion of the project, described above, outside of the MEPA review for the overall project, as requested. While I am not requiring further specific environmental review of this portion of the project, I expect that the flows from this area will be included in the analyses that are prepared during the overall environmental review.

A special procedure for review of the EIR/Facilities Plan is appropriate in this case because the Town can save both time and money through a process that focuses the problems and solutions more effectively than the standard MEPA review. The following procedure is based on discussions with the Town and its engineering consultants as well as the Department of Environmental Protection (DEP). It provides for a phased review beginning with a town-wide needs and growth management analysis (Phase I) and subsequent filings of Expanded ENFs (Section 11.05(7) of the MEPA Regulations) for subsequent phases.

Consequently, I am not issuing a detailed scope for all phases of the EIR at this time. This Certificate contains the scope for the Phase I report and a general description of the requirements for future phases.

SPECIAL PROCEDURE

The EIR process will consist of the filing of several
documents. Phase I will consist of a Needs and Growth Management Analysis covering the entire town and subsequent phases will be filed individually under the umbrella of the Phase I document. The filing under each Phase will thoroughly examine the issues associated with its respective Phase.

Each document will be distributed and reviewed according to the review procedures identified in Section 11.07 of the MEPA Regulations, EIR Preparation and Filing, including a 30 day public comment period and 7 days for the Secretary to issue a decision on adequacy.

PHASE I - NEEDS AND GROWTH MANAGEMENT

The Town has collected and analyzed considerable data on needs that should be reported in the Phase I document. The needs analysis should identify existing wastewater problems, their causes, and the geographic area over which they occur. The analysis should be based on as much empirical data as is available, or can reasonably be developed. Such data may include existing wastewater flows, septage volumes, pumping records and the like.

The analysis should result in a definition of specific service areas for application of wastewater disposal measures. It is important to note that these determinations should, in the first instance, be made independent of what measures might be available to reduce water use and subsequent demand. The analysis should specifically document the need for each disposal measure by geographic area and land use type, including a reasonable projection of growth through the design year.

In addition, the Phase I report should present an analysis that begins to take into account measures that have the potential for reducing wastewater volumes, and adjust the needs analysis accordingly. The report should address the feasibility and effectiveness of such measures and should, at a minimum, include a preliminary water demand management and conservation plan. The MEPA office has reviewed such conservation plans in the recent past that could serve as examples and I recommend consultation with the MEPA staff on this matter.

Executive Order #385 requires that state and local agencies engage in proactive and coordinated planning oriented towards both resource protection and sustainable economic development. For reasons both of environmental protection and fiscal prudence, investments in public infrastructure should be carefully targeted toward those areas for which clear existing need has been established and for areas where denser development is appropriate, thereby relieving development pressures on open space, agricultural lands, and other valuable natural resources.

The Phase I Report should identify the land uses in those areas that are determined to need collection systems, and compare the potential secondary growth impacts that may be induced by public sewers with local and regional growth management policies. If the Town has a current local comprehensive plan in place, the Phase I Report may refer to that plan's identification of priority areas for growth and development, and for open space and farmland preservation. Otherwise, that degree of planning for growth should be carried out directly as part of the Phase I Report. I encourage the proponent to consult with DEP and the Growth Management Policy staff at the Executive Office of Environmental Affairs as it develops its growth management strategy.

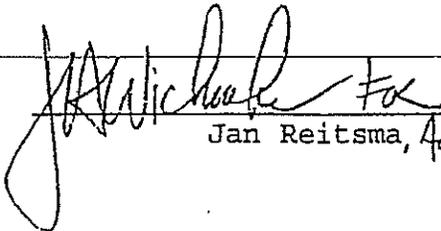
SUBSEQUENT PHASE REPORTS

Subsequent phases of the project should be reviewed beginning with the filing of an Expanded ENF, as defined in the MEPA Regulations. This filing should identify the need for corrective measures and growth management strategies, as determined in the Phase I report, and should assess the alternatives available for correcting the reported problems. The alternatives considered should include the full range of options available and each should be screened to determine which alternative can address the problems in the most environmenally sensitive and economical manner.

Environmental resources in the area of the project should be identified and an assessment can be made of the potential impacts to those resources.

Based on the information submitted for each phase, I will make an assessment as to whether an EIR is required at all, if a Single EIR (Section 11.06(8) of the MEPA Regulations) is appropriate, or if a Draft and Final EIR is required.

December 1, 1998
Date


Jan Reitsma, Acting Secretary

Date

Town of Acton

Comments received :

Department of Environmental Protection
Massachusetts Historical Commission
Massachusetts Highway Department
Metropolitan Area Planning Council
National Park Service
Organization for the Assabet River

DRAFT



APPENDIX C: CWNS PROJECT NUMBER 5000 DOCUMENTATION

Massachusetts Category 5 Waters "Waters requiring a TMDL"

NAME	SEGMENT ID	DESCRIPTION	SIZE	POLLUTANT NEEDING TMDL [EPA APPROVAL DATE-DOCUMENT CONTROL NUMBER]
Assabet River (8246775)	MA82B-03_2008	From the Route 20 Dam, Northborough to the Marlborough West WWTP discharge, Marlborough.	2.4 miles	-Nutrients [9/23/2004-CN201.0] -Pathogens -Taste, odor and color -Noxious aquatic plants -(Exotic species*) -(Objectionable deposits*)
Assabet River (8246775)	MA82B-04_2008	From the Marlborough West WWTP discharge, Marlborough to the Hudson WWTP discharge, Hudson.	8.0 miles	-Cause Unknown -Metals -Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Pathogens -Noxious aquatic plants [9/23/2004-CN201.0]
Assabet River (8246775)	MA82B-05_2008	From the Hudson WWTP discharge, Hudson to the USGS gage at Routes 27/62, Maynard.	8.2 miles	-Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Pathogens -Taste, odor and color -Noxious aquatic plants -(Exotic species*) -(Objectionable deposits*)
Assabet River (8246775)	MA82B-06_2008	From the USGS gage at Routes 27/62, Maynard to the Powdermill Dam, Acton.	1.2 miles	-Priority organics -Metals -Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Thermal modifications -Taste, odor and color -Noxious aquatic plants [9/23/2004-CN201.0] -(Exotic species*) -(Objectionable deposits*)
Assabet River (8246775)	MA82B-07_2008	From the Powdermill Dam, Acton to the confluence with the Sudbury River, Concord.	6.4 miles	-Nutrients [9/23/2004-CN201.0] -Organic enrichment/Low DO <9/23/2004-CN201.0> -Pathogens
Assabet River Reservoir (82004)	MA82004_2008	Westborough	338 acres	-Metals [12/20/2007-NEHgTMDL] -Organic enrichment/Low DO [9/23/2004-CN201.0] -Noxious aquatic plants -Turbidity -(Exotic species*)
Carding Mill Pond (82015)	MA82015_2008	Sudbury	40.5 acres	-Nutrients -Noxious aquatic plants -(Exotic species*)
Lake Cochituate (82020)	MA82020_2008	[North Basin] Natick/Framingham/Wayland	196 acres	-Priority organics -Organic enrichment/Low DO -(Exotic species*)
Lake Cochituate (82125)	MA82125_2008	[Middle Basin] Natick/Wayland	135 acres	-Priority organics -Organic enrichment/Low DO -Pathogens -(Exotic species*)

**COMPREHENSIVE WATER RESOURCES
MANAGEMENT PLAN/ENVIRONMENTAL
IMPACT REPORT PHASE I
EXISTING CONDITIONS, FUTURE
REQUIREMENTS AND PROBLEMS
IDENTIFICATION (DEFINITION OF NEEDS)
ACTON, MASSACHUSETTS**

Environmental Engineers/Consultants

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Engineering • Science • Operations

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June 2004

Additionally, the recent Wellhead Protection Study (2002) identified 47 septic systems over 2,000 gpd in Zone IIs that may impact water quality. These septic systems are included in the Acton Water District's GIS database available to the Town.

6.7 AREAS IN NEED OF OFF-SITE WASTEWATER SOLUTIONS

Figures 6-2 and 6-3 illustrate the probable grouping of the needs areas resulting from the needs assessment. Identified in the figures are:

- Parcels requiring offsite solutions,
- Parcels requiring mounded systems, and
- Large septic systems.

Lots identified as requiring offsite solutions to wastewater disposal problems are dispersed throughout the community. Attempting to service only the dispersed lots with off-site solutions would be technically impractical and cost prohibitive. Grouping "needs" lots geographically is more feasible technically and financially. Still, wastewater infrastructure constructed to serve the "needs" lots will also create links to other adjacent lots, creating potential service areas. Therefore, preliminary service/study areas have been developed that link nearby "needs" lots with lots not exhibiting pending needs.

All the identified "needs" parcels require offsite solutions. Therefore, each area reflects the same priority as determined by the methodology presented in this report. However, the order in which the Town addresses the needs areas may be developed by several methods including assigning the highest priority to the largest needs areas first or by prioritizing the needs areas that lend themselves to solving the wastewater disposal problem most quickly and inexpensively.

Figure 6-2 displays the minimum study areas based on combining closely grouped areas determined to require off-site solutions. Lots adjacent to the "needs" lots are also included to maximize the cost-effectiveness of the system. The table included with the figure lists the number of parcels in the study area and the expected wastewater flow from each parcel grouping. Total estimated flow from the minimum study areas is approximately 110,000 gallons per day.

Figure 6-3 displays the maximum study areas based on combining closely grouped areas requiring off-site solutions and adjacent parcels requiring mounded systems. Total estimated flow from the maximum study areas is approximately 265,000 gallons per day. There are several other areas where mounded systems will most likely be required but the analysis has not identified these areas as requiring off-site solutions.

FIGURE 6-2: MINIMUM SERVICE AREAS

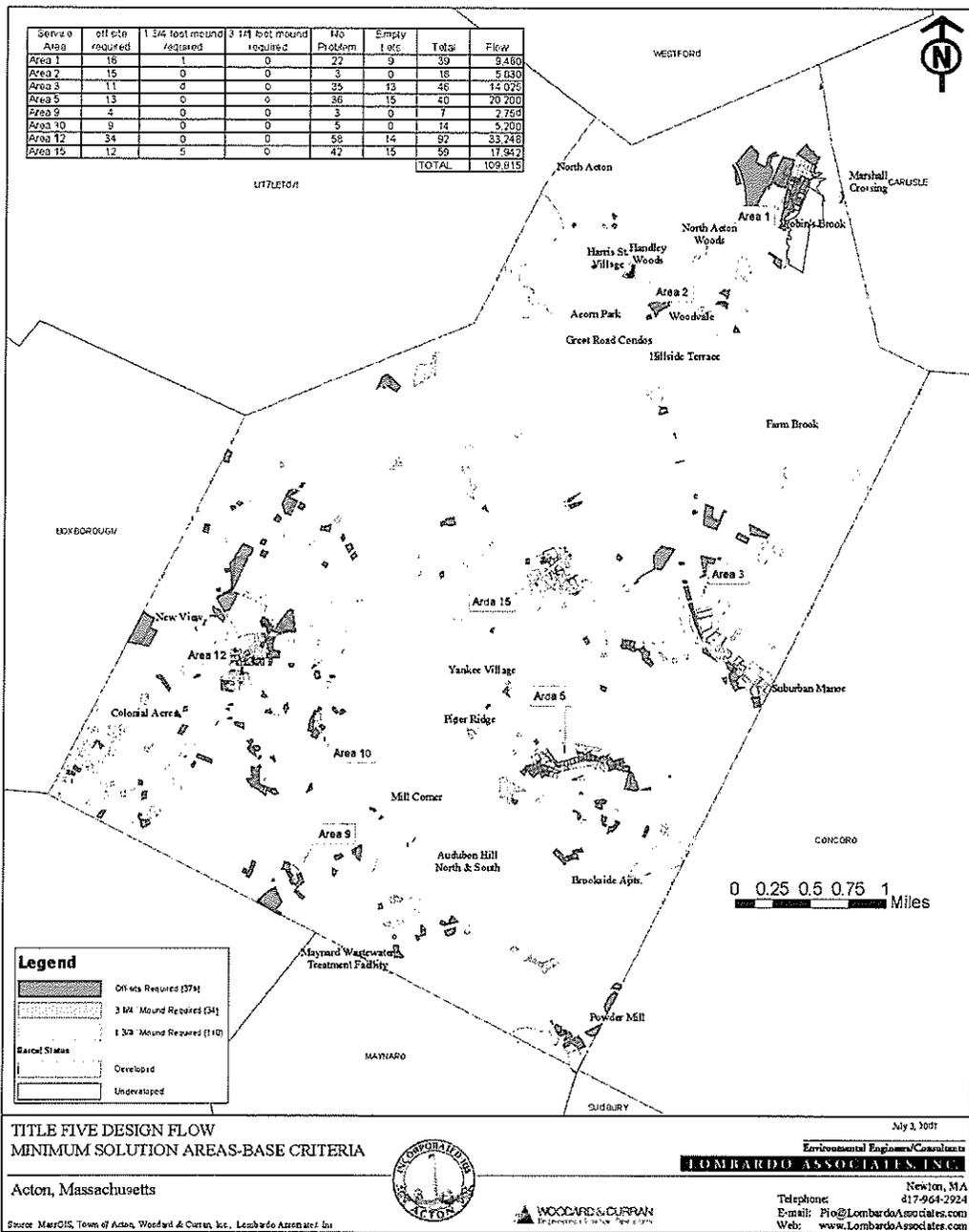
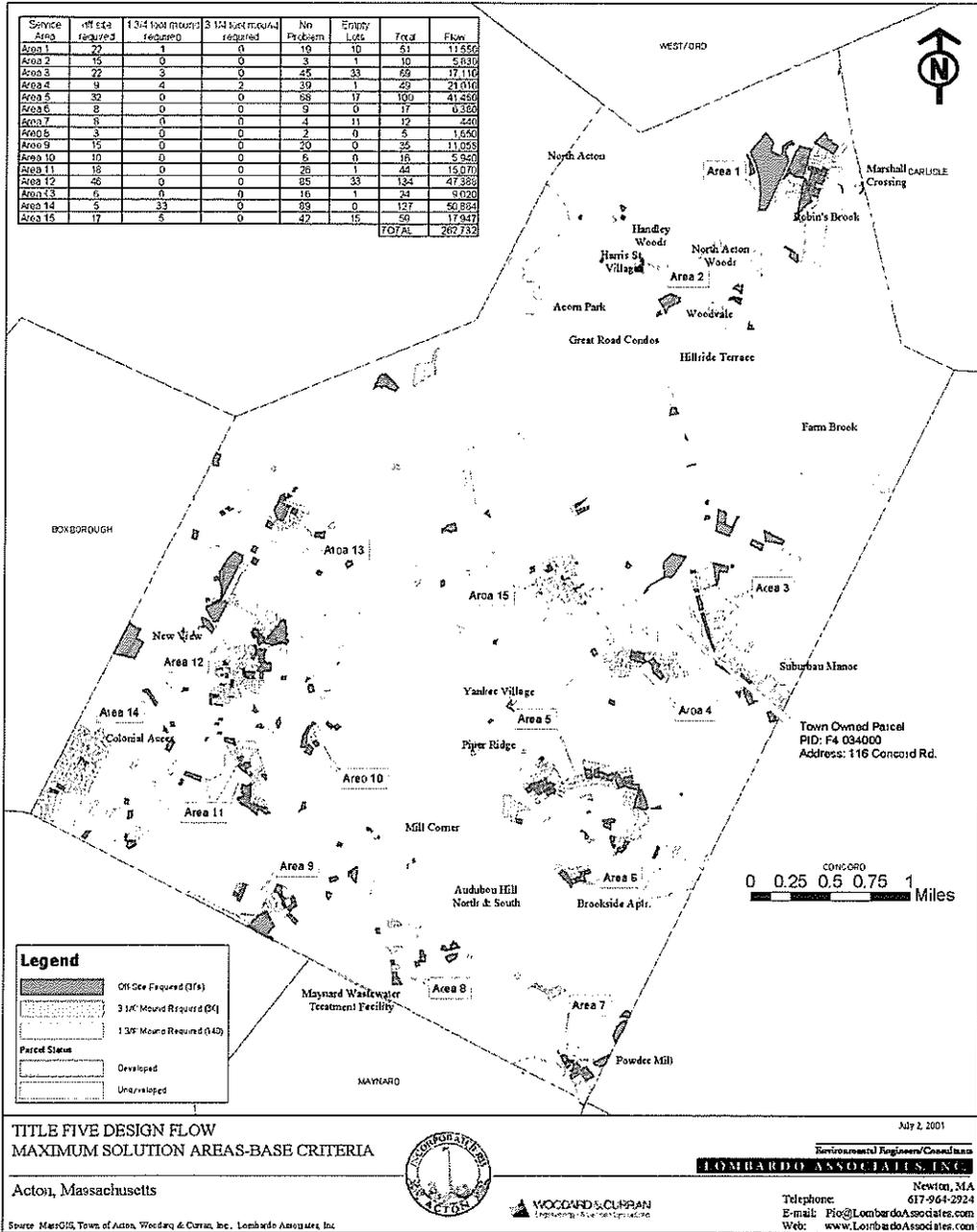


FIGURE 6-3: MAXIMUM SERVICE AREA



The grouping of study areas are the result of the GIS and database analysis of the needs criteria, interviews with town staff, CAC input, field review, and literature research. These groupings form a framework for discussing and evaluating the minimum and maximum number of parcels included in off-site systems. The boundaries of these areas will be refined and the requirement for off-site solutions will be reviewed in conjunction with potential treatment and disposal options in the next phase of the planning process.

6.8 POTENTIAL SATELLITE WASTEWATER DISPOSAL LOCATIONS

6.8.1 Introduction

The principal tool used in identifying Areas of Interest (AOI's) with potential for wastewater disposal has been the database available from the Town of Acton's GIS system and data from MassGIS. These data bases have allowed the important and limiting characteristics of soil type, such as depth to groundwater, and level of development to be combined in eliminating all areas of the Town which are inappropriate for further consideration.

All evaluations of areas eliminated or included under the various criteria below were conducted on a parcel base map available from the Acton GIS system. Physical characteristics of parcels, the areas of parcels and linking to the developed status for each parcel were carried out using GIS tools.

6.8.2 Criteria

Soil Type

The most significant characteristic in eliminating portions of Town unsuitable for wastewater effluent disposal is soil type. Areas without water-lain deposits of sands and gravels are not expected to be able to infiltrate wastewater effluent quickly enough to be of value in a small municipal disposal program. Thus areas without these soil characteristics are eliminated from consideration.

Seasonal High Groundwater

Another significant hydrogeologic characteristic for wastewater disposal is the depth to seasonal high groundwater. MA DEP regulations require a minimum of four feet of unsaturated soils below the wastewater effluent discharge facility, after any groundwater mounding has occurred. As an initial criterion, to allow for limited mounding and some embedment of the facility, areas with 6 feet or less to seasonal high groundwater are rejected. This criteria may be revisited in subsequent phases if a parcel is identified that meets all other criteria and would benefit from some effort in adding soil to increase the surface elevation above the groundwater level.

Developed land

Development or building on parcels, particularly residential development on small lots, is not desirable when selecting wastewater effluent disposal locations due to potential disruption of residents during construction and frequent resistance and concern about having a nearby facility. Thus an initial evaluation is to eliminate all but vacant parcels.

However, an additional analysis was conducted at the request of the CAC and Health Department. The CAC identified several parcels that are largely unused, with one or a few buildings, on large lots. The Health Department identified additional lots based on knowledge of the local soils and groundwater. The

**Comprehensive Water Resources Management
Plan (CWRMP) – Phase 2**

Volume 1 of 5

Town of Acton, MA

**March 2006
Revised June 2006**



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2.3 EVALUATION CRITERIA

A main component of the Phase 1 process was the assessment of the need for alternative wastewater disposal other than continued reliance on conventional onsite wastewater systems. A maximum of 15 Needs Areas were identified. Figure 1-2 shows the location of the following Needs Areas.

1. Marshall Crossing / Robbins Brook / North Acton Village
2. Nagog Woods / Acorn Park / North Acton Woods
3. East Acton Village / Route 2A
4. Concord Road / Robbins Park
5. Brucewood Estates
6. Brookside Apartments/Circle
7. Powdermill Plaza
8. Maynard border / South Main Street
9. Heath Hen Meadow / Billings and Stow Streets
10. Spencer Road and Tuttle/Flint/Mallard neighborhood
11. Nash and Downey Roads / Dover Heights
12. West Acton Center
13. Indian Village
14. Flagg Hill
15. Acton Center (Town Hall) / Patriot's Hill

2.3.1 Needs Areas Development

The Needs Areas were developed through the evaluation of technical and non-technical criteria in a multi-step process involving an interactive dialogue between the Project Team and a very involved CAC. Phase 1 included the first two steps, with Phase 2 picking up with Step 3.

2.3.1.1 Phase 1 Needs Areas Development

Step 1 – Identify Needs in Acton

Areas in need of wastewater disposal solutions are identified. The data from the BOH records, CAC input, previous reports and studies, surface water and groundwater sampling, and local regulations and bylaws form the basis for the analysis of the “needs”. Potential technical alternatives for wastewater collection, treatment, disposal and management are evaluated for application in Acton.

Step 2 – Create Needs Areas

Needs Areas are created based on the technical evaluation and on “non-technical” parameters. Technical criteria include regulatory setback requirements, design parameters, and data on special designs from Board of Health (BOH) records. The CAC reviewed the technical information and provided anecdotal



evidence to complement the technical criteria. Table 2-1 lists the technical criteria evaluated as part of Phase 1, Step 2.

Table 2-1: Technical Criteria for Phase 1

Regulatory Minimum Setbacks	Design Parameters / BOH Data
• Property Line	• Percolation Rate
• Buildings	• Depth to Groundwater
• Wetlands	• Depth to Bedrock
• Floodplains	• Mounded Construction
• Surface Water	• Variances
• Public Well	• Special Technologies (I/A, etc.)
• Private Well	
• Vernal Pools	

Table 2-2 presents the Non-Technical Criteria evaluated as part of Phase 1, which include items raised by the CAC. The non-technical criteria process was used to verify the selection of technical Needs Areas and ensure that the community's entire needs were considered.

Table 2-2: Non-Technical Criteria for Phase 1

Non-Technical Criteria	
• Aesthetics (mounded systems, tree removal, etc.)	• Location of human sensitive receptors
• Neighborhood character – maintain the rural nature of Acton	• Potential to link solution to other opportunities
• Consistency with other town plans	• Regulatory pressure
• Growth – in designated areas	• Ability to implement solution given location, costs, etc
• Archeological and historical impacts	• Costs
• Optimization of existing sewer system	• Protection of environment (wetlands, groundwater, etc)

The CAC recognized that potential solutions are inextricably linked to the criteria that determines Needs Areas and therefore considered the potential to link the solution to other opportunities, such as rail trail construction, as needs criteria for evaluation.

The Project Team presented potential technological solutions to the CAC for evaluation. In-town locations for disposal facilities were identified though an evaluation similar to the needs assessment by searching for publicly owned property and large tracts of private land with favorable soils located outside of sensitive resource areas. Table 2-3 presents the technology alternatives for solutions and the criteria for assessment for disposal sites conducted as part of Phase 1.



Table 2-3: Technology Alternatives and Disposal Site Evaluation

Preliminary Technology Evaluation	Disposal Site Evaluation
<ul style="list-style-type: none">• Onsite	<ul style="list-style-type: none">• Percolation rate (soils type)
<ul style="list-style-type: none">• Clusters	<ul style="list-style-type: none">• Depth to groundwater
<ul style="list-style-type: none">• Decentralized	<ul style="list-style-type: none">• Depth to bedrock
<ul style="list-style-type: none">• Centralized in-town	<ul style="list-style-type: none">• Sensitive human receptors
<ul style="list-style-type: none">• Centralized regional	<ul style="list-style-type: none">• Sensitive environmental receptors
	<ul style="list-style-type: none">• Well impacts
	<ul style="list-style-type: none">• Proximity to Needs Areas
	<ul style="list-style-type: none">• Availability of land

Potential disposal locations are identified through analysis of the technical criteria and by applying the “non-technical” criteria in a method similar to the process used to create Needs Areas.

2.3.1.2 Phase 2

Phase 2 of the CWRMP began with Step 3, in which the CAC finalized the criteria for each Needs Area.

Step 3 – Create Needs Planning Areas

The CAC began the Phase 2 process by assessing the Needs Area groupings developed in Phase 1. The areas were refined based on topography, underlying geology, and socio-economic factors, such as traditional neighborhood boundaries and planned economic growth areas. Figure 2-2 shows the Needs Planning Areas (Areas). The Areas are deliberately large to capture environmental similarities within the Areas, and encompass entire neighborhoods that traditionally may be perceived as single entities. Final solutions may encompass the entire Needs Planning Area or portions of the Areas depending on the needs and a final evaluation prior to program implementation.

Step 4 – Finalize Criteria Ranking

The CAC agreed the Needs Planning Areas identified at this point are in need of new solutions from a technical needs viewpoint. The CAC agreed that all of the technical criteria addressed environmental concerns and are therefore of equal rank, but some “non-technical” criteria are more important than others.

Priority non-technical criteria that address potential solutions include implementability; growth, especially economic growth in areas designated for growth; optimization of the current wastewater infrastructure and wastewater treatment facility (WWTF); and reclaimed water use and recharge of groundwater/aquifers. These criteria are not explicitly attached to specific Areas; rather they are primary, or overriding, criteria for all Areas. A summary of the CAC’s input on important non-technical criteria is:



1. Implementability

Implementability includes of the feasibility of a technical solution, probability of permitting, considerations such as addressing the areas initially planned to be part of an expanded sewer district as part of the Middle Fort Pond Brook system, and local residents' perceptions.

The availability of implementable solutions governs the final recommended solutions. Often a Needs Planning Area will have multiple technical solutions. But, when considering potential solutions, political, financial and popular opinions play a role. The CAC concluded that implementability also meant the ability to convince Town Meeting that the recommended plan is the correct plan, especially considering that residents who were included in the initial plans for an expanded sewer district may not be served under the CWRMP's framework.

The timeline for implementation is also important because of the timing of related projects. The CAC would like to see structural solutions link to other opportunities such as rail trail construction and recreation field development. In addition, pressure from regulatory agencies to solve specific current, potential, or pending, problems may drive the solutions at a schedule different from the CWRMP implementation schedule.

2. Growth

Potential economic growth areas include West Acton Center/Village (Area 12) and East Acton Village (Area 3) extending along Route 2A. The village areas in particular have developed special planning documents and zoning that target the villages for economic growth, but in character with the existing mixed-use environment.

Secondary growth impacts (positive and negative) should be evaluated if expanded wastewater disposal capacity, such as sewerage, is considered in a village area.

Needs Planning Areas

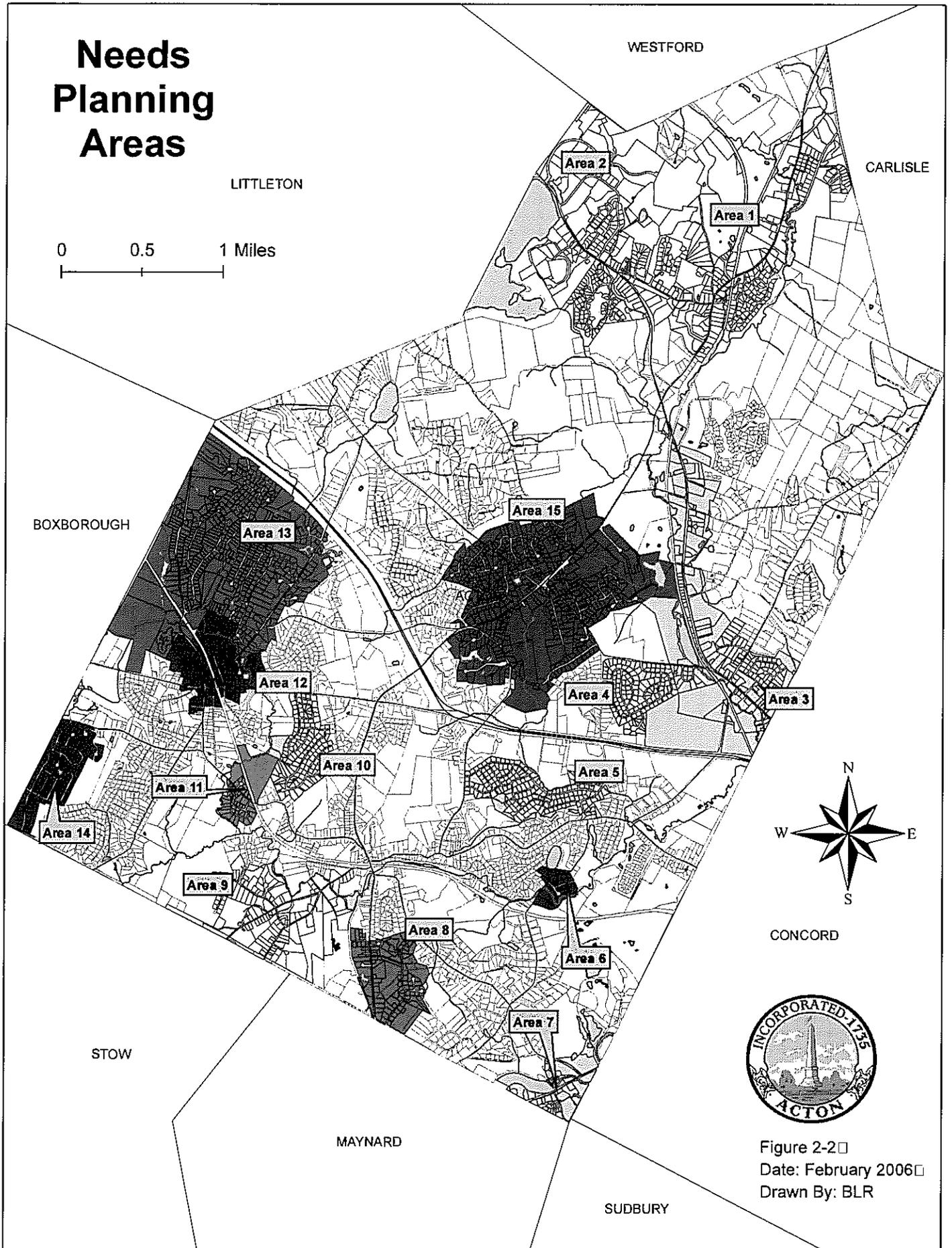


Figure 2-2 □
Date: February 2006 □
Drawn By: BLR



3. Optimization

Optimization of the current wastewater infrastructure and treatment facility, which may include connecting as many properties as possible to fully use the pipes, pump stations and treatment facility may achieve an economy of scale. The CAC agreed that if additional sewerage is developed, the infrastructure should address the Needs Areas as the priority. Solutions should be linked to lots that actually need a solution, not conveniently connecting contiguous properties while leaving out a nearby Needs Area, even if more expensive.

4. Reuse/recharge

Use and recharge of reclaimed water, whether treated wastewater or stormwater, includes finding disposal locations within Acton to recharge the local aquifer instead of seeking a surface water discharge. The existing sewer collection and treatment facilities could be used in conjunction with subsurface discharge locations located some distance from the treatment facility. Other satellite treatment and disposal systems could be located in areas that may recharge aquifers. Wastewater effluent discharge for the purpose of recharging drinking water aquifers may also be a long-range option.

Acton, as a NPDES Phase II community, is undertaking programs to control, manage, and treat stormwater runoff. Acton's S.319 grant addressed the difficulty of siting end-of-pipe treatment and recommended on-site controls. Infiltration in particular can benefit local aquifers. Low Impact Development (LID) is one technique that addresses stormwater at its source instead of through end-of-pipe solutions. Increased infiltration and runoff control is being addressed through development of Acton's post-construction runoff control bylaw.

Step 5 – Rank Needs Planning Areas

Once the criteria were established and finalized, the CAC identified the criteria most important to each Area through discussion of each criteria for each Needs Area. Next the Areas were prioritized through discussion and vote, followed by prioritization of solutions, again through discussion and vote for each Area. The next section presents a detailed discussion of the alternatives assessment process.

2.4 EVALUATION OF ALTERNATIVES

The CAC meeting process from June 2004 through April 2006 provides the road map to the evaluation of alternatives. During these meetings, the Project Team and CAC evaluated and ranked each alternative solution for each Needs Planning Area. Meeting minutes and public outreach material are compiled in Appendix B.

The CAC set some general limits to the feasibility of potential solutions. Generally, extending the existing collection system for Areas north of Route 2 or construction of new collection and treatment systems for Areas adjacent to the existing collection system are considered not feasible.

The CAC prioritized the needs criteria in each Area and then prioritized the Areas. Potential solutions were identified that addressed the needs criteria and resolved environmental and public health concerns. The CAC then ranked the solutions, identifying preferred solutions for each Area that reflected the community's goals for each area and addressed the primary criteria of implementability, economic growth, optimization, and reuse/recharge.



3.2.3 Wastewater Management Districts

With the Septage Management Enterprise Fund, the Town has a dedicated funding source that has the ability to evolve along with any management plan that is chosen. Since its inception it has changed to account for the Stream Monitoring Program, the Monitoring Well Program, Title 5 and Innovative/Alternative systems management program. The Septic program is analyzed on a periodic basis and fees for services, as well as all support costs, are adjusted based on the services required. Appendix I contains calculation sheets supporting the fees associated with program administration and implementation.

An additional example of the Enterprise Fund's flexibility will be shown in 2006 when Acton will commit its first betterments to onsite wastewater system reconstruction. The Town will access State Revolving Funds with 20-year repayment schedules and loan funds to homeowners with 5-10 year repayment schedules. This will allow the Town to use the funds several times over the course of the 20-year payback schedule.

As the Town makes the decisions on the menu of recommendations of the Comprehensive Water Resources Management Plan it will be well served by the unique flexibility of the Septage Management Enterprise Fund. As has been done in the past, costs for every aspect of any management plan will be identified and charged to beneficiaries of the service. This would allow the Town to, in the most extreme, hire a consultant to inspect Innovative/Alternative systems and charge the homeowner for that service or to allow the homeowner to hire the consultant and pay a minimal fee that would cover oversight costs by the Town.

Costs associated with the Wastewater Management District include development, startup, and life-cycle costs. Although the program should be designed to run in perpetuity, we have set the timeline to the 20-year planning period.

3.2.3.1 WWMD Costs

We have developed conceptual level costs assuming the Town institutes a Level 4 WWMD, which is uncertain until the final evaluation of program options is complete. The costs, including startup and operation & maintenance (O&M), would include:

- Staff to manage the data and operation of the district(s)
- Capital equipment necessary for district operations
- Data maintenance
- Development of the final program
- Legal fees for the creation of the districts
- Software development
- Subcontractor services (system pumping, inspection, O&M, etc.)
- Miscellaneous supplies

Table 3-6 presents budgetary estimates of one scenario for WWMDs program costs. The evaluation assumes an interest rate of 5%.



Table 3-6: Summary of Level 4 WWMD Estimated Setup and Operational Costs

Expenditure	Time Frame	Cost	Present Worth
Legal Support	Year 1	\$30,000	\$30,000
Legal Support	30 years	\$2,000/year	\$31,000
Software Purchase	Year 1	\$20,000	\$20,000
Software Support/Upgrade	30 years	\$1,000/year	\$15,500
Annual Supplies	30 years	\$5,000/year	\$77,000
Office Staff	30 years	\$55,000/year*	\$845,000
Management / Field Staff	30 years	\$100,000/year*	\$1,538,000
Startup Capital Equipment	Year 1	\$50,000	\$50,000
Equipment Maintenance	30 years	\$7,500/year	\$115,300
Subcontractor Services	30 years	\$700,000/year	\$10,761,000
		TOTAL	\$13,482,800

*Personnel costs reflect total costs, including benefits

A large measure of uncertainty in cost estimating exists at this point in the analysis; the development and implementation of the WWMD program will require a feasibility study. Therefore, the Engineers opinion of conceptual-level costs to implement Level 4 Wastewater Management Districts and sustain the districts for 30 years could range from \$12.0 million to \$13.5 million in present worth dollars.

In 1998 the Town drafted a Wastewater Management Plan (Appendix I) that envisioned these issues and sought to bring resolution to them. This current plan is using the previous draft plan as a springboard to a fully integrated, sustainable, wastewater management system in Acton.

The town does not envision a betterment program similar to the Sewer Assessment Bylaw to sustain the WWMDs. Instead, a yearly fee to cover the expenses of the program would be instituted. The fee, assuming 5% interest rate comparable to the sewerage present worth analysis, amounts to approximately \$340 per year per parcel for an \$12 million program to \$380 per year per parcel for a \$13.5 million program (assuming 2,300 parcels).

Currently, the Town requires pumping of septic systems every two years at an approximate cost per pumping event of \$200. Additional costs, such as more frequent pumping, inspections for real estate transactions, special inspections, and testing are variable and not included. The WWMD's yearly fee, however, includes increased monitoring, pumping, inspections, and operations and maintenance.

3.2.3.2 WWMD Schedule

The schedule for implementing Wastewater Management Districts can move independently from the sewer extension schedule. The Town should conduct a detailed feasibility study prior to embarking on



creation of a final plan. The feasibility study can start as soon as Town Meeting appropriates funds, or as soon as funding (grant) opportunities are available. The town has submitted requests for the development of similar programs to several funding programs (s.319, 604b, CZM) without success. Therefore, the town should appropriate funds in fall 2006 to develop the framework of Wastewater Management Districts in Acton. The process should be complete within one year of the appropriation with active citizen involvement.

3.3 SUMMARY OF THE RECOMMENDED PLAN

3.3.1 Long-Term Recommendations

Figure 3-4 presents the visual guide to the final recommendations. It includes West Acton Center-A in the recommendations for sewer extension with West Acton-B included under a Wastewater Management District. Final capacity availability and wastewater flows will be determined as part of a preliminary design phase and ENF process associated with the recommended solution. Table 3-7 contains the primary recommendations and provides the menu of other viable alternatives available to each Area.

Sewer Extensions

- Powdermill Plaza / High Street (Area 7) – The CWRMP concurs with the Town’s decision to move forward with sewer construction
- Spencer/Tuttle/Flint (Area 10)
- West Acton Center-A (Area 12)

Cluster (Public/Private)Systems

Areas recommended for cluster system solutions could also be included in Wastewater Management Districts if cluster systems are not implementable or wastewater management could be implemented in conjunction with cluster systems.

- Marshall Crossing / Robbins Brook (Area 1)
- Nagog Woods/ Acorn Park / North Acton Woods (Area 2)
- East Acton Village (Area 3)
- Brookside Circle (Area 6)
- Nash and Downey Roads / Dover Heights (Area 11)

Wastewater Management Districts

- Robbins Park (Area 4)
- Brucewood Estates (Area 5)
- Maynard Border (Area 8)
- Heath Hen Meadow (Area 9)
- West Acton Center-B (Area 12)
- Indian Village (Area 13)
- Flagg Hill (Area 14)
- Acton Center (Area 15)

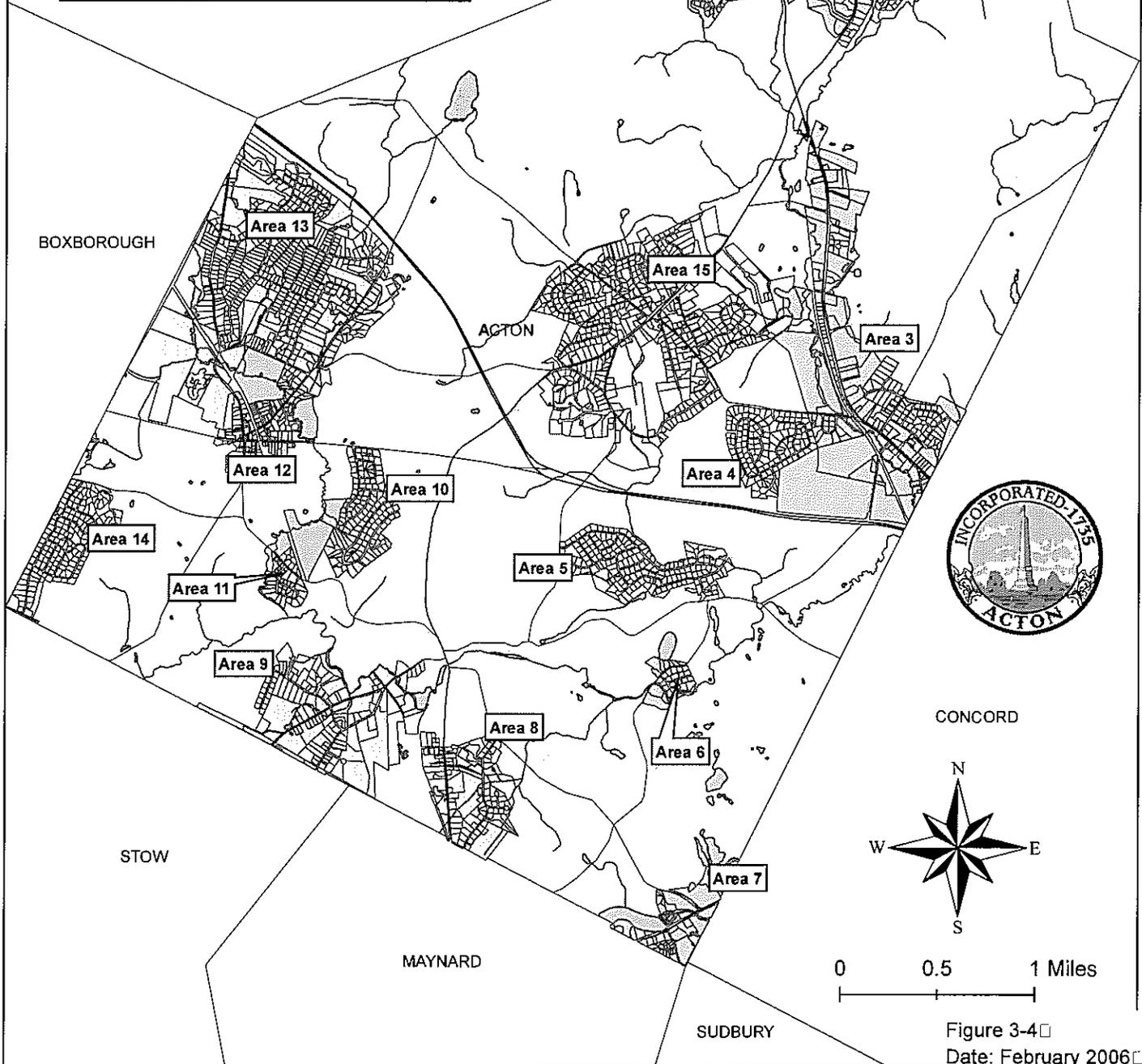
Recommended Solutions For Needs Planning Areas

WESTFORD

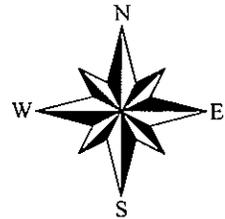
LITTLETON

CARLISLE

	Cluster/Neighborhood System
	Wastewater Management District
	Connect to Existing Sewers



CONCORD



0 0.5 1 Miles

Figure 3-4
Date: February 2006
Drawn by: BLR

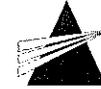


Table 3-7: Recommended Solutions Matrix

Rank (1-4) with 1 being the recommended choice (NA = Not Applicable)						
Needs Area #	Description	Current Priority Status	Connect to Existing Sewers	Construct New WWTF/Sewers	Cluster System	Wastewater Management District
1	North Acton Village Marshall Crossing Robbins Brook	Medium	NA	3	1	2
2	Nagog Woods Acorn Park North Acton Condos	Low	NA	2	1	NA
3	East Acton Village Route 2A	High	NA	2	1	3
4	Concord Road Robbins Park	Low	NA	2	3	1
5	Brucewood Estates	Medium	3	NA	2	1
6	Brookside Circle	Low	3	NA	1	2
7	Powdermill Plaza	High	1	NA	NA	NA
8	Maynard Border	Medium	2 Maynard or Acton	NA	3	1
9	Heath Hen Meadow / Stow Street	Low	3	NA	2	1
10	Spencer / Tuttle / Flint	High	1	NA	NA	2
11	Nash / Downey Dover Heights	Medium	NA	NA	1	2
12	West Acton Center – A	High	1	NA	2	3
12	West Acton Center – B	High	2	NA	3	1
13	Indian Village	High	NA	3	2	1
14	Flagg Hill	Medium	NA	NA	2	1
15	Acton Center	Low	NA	2 - East Acton	3	1



Other Long-Term Recommendations

- Continue the surface and groundwater sampling program to integrate the programs with Wastewater Management Districts and monitor watershed health.
- Continue to monitor the advances and regulations regarding reclaimed water use in Massachusetts.
- Continue a proactive public outreach and participation program and coordinate efforts with the NPDES Phase II Stormwater Management Program and Acton Water District initiatives.

3.3.2 Short-Term Recommendations

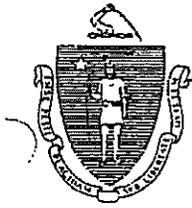
- Develop a feasibility study for developing Wastewater Management Districts.
- Conduct a small scale pilot study of technologies for reclaimed water use once regulations provide guidance to treatment and discharge requirements.
- Appropriate funds in fall 2006 for final study and conceptual design of the Spencer / Tuttle / Flint and West Acton Center-A sewer extension, including public outreach and MEPA submittal.
- Appropriate funds in spring 2007 for design of Spencer / Tuttle/ Flint and West Acton Center-A solutions, and to submit a State Revolving Fund application for a construction loan.
- Submit an application for State Revolving Funds for construction of the Spencer / Tuttle / Flint and West Acton Center-A sewer extension in August 2007.
- Appropriate funds in spring 2008 for construction of the Spencer / Tuttle / Flint and West Acton Center-A sewer extension scope as determined through the conceptual and final design phases.
- Pursue legislative changes to the betterment rules to allow redistribution of betterment assessments for funding of the sewer projects.

3.4 ENVIRONMENTAL IMPACTS OF THE RECOMMENDED PLAN

The Recommended Plan is comprised of non-structural, private, and public structural solutions that will benefit the overall environmental health of Acton's water resources and reduce risks to public health. The recommended structural solution, extending sewers to High Street (Powdermill Plaza), and the Spencer/Tuttle/Flint area and West Acton Center-A, will have some temporary construction impacts from noise, dust, and traffic due to general excavation activities. However, new NPDES Phase II requirements to regulate construction site runoff are directed at mitigating short-term and long-term impacts of construction.

The recommended plan takes measures to minimize the environmental impact of construction activity through design, such as minimizing cross-country excavations and locating pump stations and other infrastructure away from resource areas, and during construction, such as requiring erosion control measures to control runoff impacts.

The recommended plan does not require additional disposal area or treatment facility construction. The Adams Street WWTF does not need alterations or expansion to accept and adequately treat and dispose of the wastewater. The sewer extension recommended for Spencer/Tuttle/Flint and West Acton Center-A would increase existing WWTF by over 10%, which triggers a MEPA threshold for an ENF submittal.



The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street, Boston, MA 02202

ARGEO PAUL CELLUCCI
 GOVERNOR
 TRUDY COXE
 SECRETARY

Tel: (617) 727-9800
 Fax: (617) 727-2754
<http://www.magnet.state.ma.us/envir>

December 1, 1998

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
 ESTABLISHING A SPECIAL PROCEDURE
 FOR MEPA REVIEW

PROJECT NAME : Comprehensive Wastewater Management Plan
 PROJECT MUNICIPALITY : Acton
 PROJECT WATERSHED : Assabet
 EOEI NUMBER : 11781
 PROJECT PROPONENT : Town of Acton
 DATE NOTICED IN MONITOR : October 25, 1998

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and Sections 11.03 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project requires the preparation of an Environmental Impact Report (EIR). Furthermore, pursuant to Section 11.09 of the MEPA Regulations, I hereby establish a special procedure for review of the required EIR.

This project involves the development of a town-wide wastewater management plan for the Town of Acton. The Town has previously developed Wastewater Management/Facilities Plans and these resource materials should be useful in preparing the required Environmental Impact Report.

The Town has requested that a portion of the sewerage project, described in the Environmental Notification Form as Middle Fort Pond Brook Sewer Project, which includes portions of South Acton and Kelley's Corner, be allowed to proceed prior to completion of the overall environmental review for the wastewater management planning process. The areas in question currently have problems meeting the provisions of Title 5 and are among the more densely developed areas of the community.

The Middle Fort Pond Brook Project involves the installation of slightly less than 10 miles of new sewers and the construction of a new sewage treatment facility with a groundwater discharge

at the Adams Street site. The town has prepared a geohydrologic analysis for the discharge site that clearly shows that disposal of up to 250,000 gallons per day of highly treated effluent can be accommodated without significant threat of adverse environmental impact. Most of the sewer installation will be within existing public ways, which minimizes the potential for adverse impacts from the installation of those sewers. I find that the need for this portion of the project has been shown and that the permitting process with the Department of Environmental Protection will provide the design details necessary to ensure protection of the environment.

Based on my review of that information, I will allow the Town to proceed with that portion of the project, described above, outside of the MEPA review for the overall project, as requested. While I am not requiring further specific environmental review of this portion of the project, I expect that the flows from this area will be included in the analyses that are prepared during the overall environmental review.

A special procedure for review of the EIR/Facilities Plan is appropriate in this case because the Town can save both time and money through a process that focuses the problems and solutions more effectively than the standard MEPA review. The following procedure is based on discussions with the Town and its engineering consultants as well as the Department of Environmental Protection (DEP). It provides for a phased review beginning with a town-wide needs and growth management analysis (Phase I) and subsequent filings of Expanded ENFs (Section 11.05(7) of the MEPA Regulations) for subsequent phases.

Consequently, I am not issuing a detailed scope for all phases of the EIR at this time. This Certificate contains the scope for the Phase I report and a general description of the requirements for future phases.

SPECIAL PROCEDURE

The EIR process will consist of the filing of several
documents. Phase I will consist of a Needs and Growth Management Analysis covering the entire town and subsequent phases will be filed individually under the umbrella of the Phase I document. The filing under each Phase will thoroughly examine the issues associated with its respective Phase.

Each document will be distributed and reviewed according to the review procedures identified in Section 11.07 of the MEPA Regulations, EIR Preparation and Filing, including a 30 day public comment period and 7 days for the Secretary to issue a decision on adequacy.

PHASE I - NEEDS AND GROWTH MANAGEMENT

The Town has collected and analyzed considerable data on needs that should be reported in the Phase I document. The needs analysis should identify existing wastewater problems, their causes, and the geographic area over which they occur. The analysis should be based on as much empirical data as is available, or can reasonably be developed. Such data may include existing wastewater flows, septage volumes, pumping records and the like.

The analysis should result in a definition of specific service areas for application of wastewater disposal measures. It is important to note that these determinations should, in the first instance, be made independent of what measures might be available to reduce water use and subsequent demand. The analysis should specifically document the need for each disposal measure by geographic area and land use type, including a reasonable projection of growth through the design year.

In addition, the Phase I report should present an analysis that begins to take into account measures that have the potential for reducing wastewater volumes, and adjust the needs analysis accordingly. The report should address the feasibility and effectiveness of such measures and should, at a minimum, include a preliminary water demand management and conservation plan. The MEPA office has reviewed such conservation plans in the recent past that could serve as examples and I recommend consultation with the MEPA staff on this matter.

Executive Order #385 requires that state and local agencies engage in proactive and coordinated planning oriented towards both resource protection and sustainable economic development. For reasons both of environmental protection and fiscal prudence, investments in public infrastructure should be carefully targeted toward those areas for which clear existing need has been established and for areas where denser development is appropriate, thereby relieving development pressures on open space, agricultural lands, and other valuable natural resources.

The Phase I Report should identify the land uses in those areas that are determined to need collection systems, and compare the potential secondary growth impacts that may be induced by public sewers with local and regional growth management policies. If the Town has a current local comprehensive plan in place, the Phase I Report may refer to that plan's identification of priority areas for growth and development, and for open space and farmland preservation. Otherwise, that degree of planning for growth should be carried out directly as part of the Phase I Report. I encourage the proponent to consult with DEP and the Growth Management Policy staff at the Executive Office of Environmental Affairs as it develops its growth management strategy.

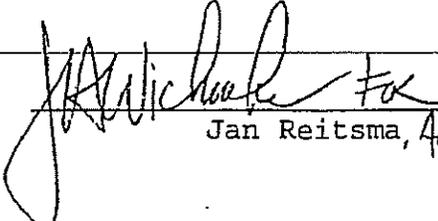
SUBSEQUENT PHASE REPORTS

Subsequent phases of the project should be reviewed beginning with the filing of an Expanded ENF, as defined in the MEPA Regulations. This filing should identify the need for corrective measures and growth management strategies, as determined in the Phase I report, and should assess the alternatives available for correcting the reported problems. The alternatives considered should include the full range of options available and each should be screened to determine which alternative can address the problems in the most environmentally sensitive and economical manner.

Environmental resources in the area of the project should be identified and an assessment can be made of the potential impacts to those resources.

Based on the information submitted for each phase, I will make an assessment as to whether an EIR is required at all, if a Single EIR (Section 11.06(8) of the MEPA Regulations) is appropriate, or if a Draft and Final EIR is required.

December 1, 1998
Date


Jan Reitsma, Acting Secretary

Date

Town of Acton

Comments received :

Department of Environmental Protection
Massachusetts Historical Commission
Massachusetts Highway Department
Metropolitan Area Planning Council
National Park Service
Organization for the Assabet River



United States Department of the Interior

U.S. GEOLOGICAL SURVEY

RECEIVED

JUL 14 2008

July 10, 2008

Dear Local Health Official: ACTON BOARD OF HEALTH

The U.S. Geological Survey (USGS) and the Massachusetts Department of Environmental Protection (MDEP) are conducting a study to assess concentrations of arsenic and uranium in bedrock wells in east central Massachusetts. Staff from the Massachusetts Department of Public Health, Bureau of Environmental Health (MDPH/BEH) are assisting the USGS and MDEP with this effort in an attempt to determine if arsenic or uranium concentrations in wells are affecting the public health of residents who live in these areas. This letter is to inform you of this interagency effort and our plan to implement the sampling phase of this project later this summer.

The USGS and MADEP are using state well-installation databases to identify potential wells for sampling. The databases occasionally lack current information, such as well owner and address, or well construction details, such as casing length and well depth in bedrock. If your town maintains a computer database on private well locations, ownership, and well construction details, this information would be useful to us in our investigation. If at all possible, we would like this information to be made available to us to select wells randomly for possible testing. We would be more than happy to come to your office to review available information. Please respond by mail, email, or phone using the contact information below.

The need to learn more about uranium and arsenic in Massachusetts wells was prompted by recent changes in federal drinking water standards for uranium (in 2000) and arsenic (in 2006). The focus of this investigation is east-central Massachusetts, an area of the state where elevated levels of arsenic have previously been detected (see figure 1). The most likely source of these elements is from their natural occurrence in bedrock. The project will attempt to assess (1) the approximate number of private wells that contain raw-water concentrations of arsenic or uranium that are greater than the current drinking water standards of 0.03 milligrams per liter (mg/L), for uranium, and 0.01 mg/L, for arsenic, (2) the degree to which bedrock units can be associated with concentrations of uranium and arsenic; and (3) whether individuals consuming the water may have elevated concentrations of these elements in their urine.

The bedrock well sample design of the project follows that of a similar study conducted by the USGS in New Hampshire (<http://pubs.usgs.gov/fs/fs-051-03/>), where samples were collected by well owners and sent to the USGS using materials provided in sampling kits. In the New Hampshire study, a correlation between bedrock unit and arsenic concentration was established. Since similar bedrock units extend south from New Hampshire through Massachusetts, correlation is likely in Massachusetts as well.

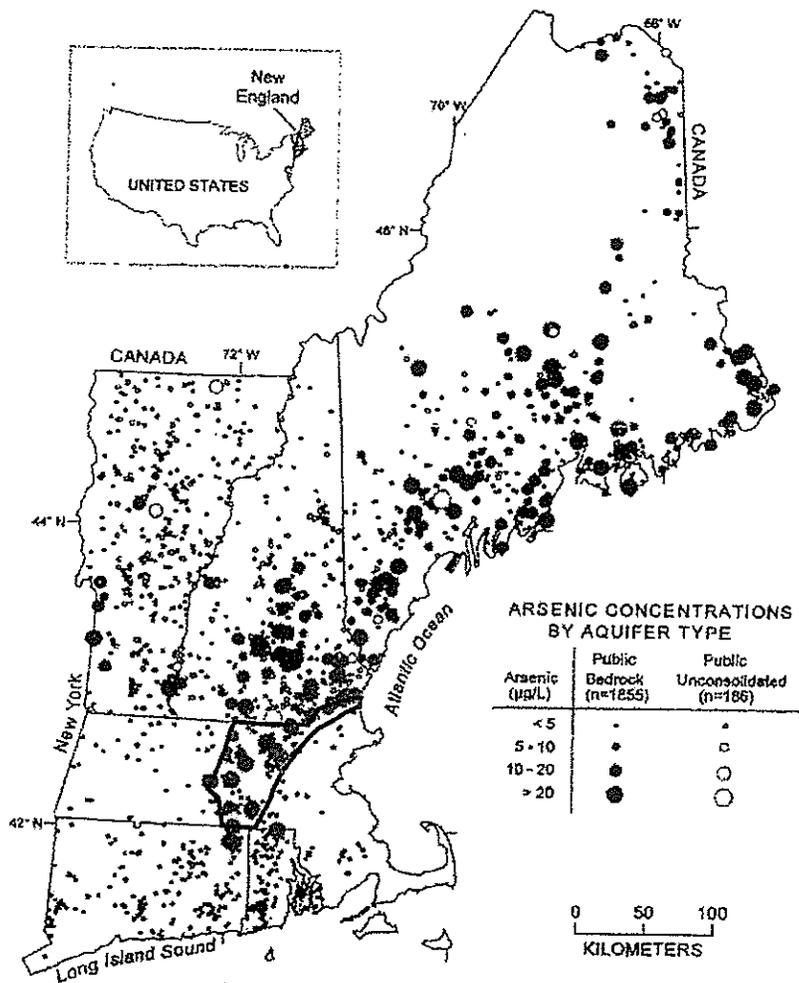


Figure 1. Concentrations of arsenic in public bedrock wells in New England, with border added indicating extent of higher concentrations for Massachusetts. The arsenic concentration figure is adapted from a publication by J. D. Ayotte and others, "Arsenic in groundwater in eastern New England: Occurrence, controls, and human health implications", published in *Environmental Science and Technology*, vol. 37, pp. 2075-2083.