

Acton Comprehensive Water Resources Management Plan - Phase 2 Report Executive Summary

The purpose of this Phase 2 CWRMP is to complete the planning process begun with the issuance of a Massachusetts Environmental Policy Act (MEPA) certificate in December 1998 for the Middle Fort Pond Brook Sewer Project. The MEPA Certificate (EOEA No. 11781) established a Special Procedure for the preparation and review of a town-wide plan.

The precursor of this report is the Phase 1 Definition of Needs report, which assessed overall environmental conditions, evaluated water resources (drinking, ground water, surface water, wastewater) quality and quantity, and identified areas in need for alternative wastewater disposal solutions in Acton. The report identified 15 Needs Areas (see the attached Figure – Maximum Needs Areas Delineation).

This Phase 2 report evaluates alternatives to provide a 20-year plan for water resources protection in Acton. Included in this CWRMP are an assessment of Acton's wastewater disposal needs and an evaluation of the potential structural and non-structural systems and technologies for a range of on-site, localized, centralized and decentralized solutions.

The Phase 2 report scope of work is to:

- Assess town-wide wastewater management needs to update all related plans
- Evaluate alternative solutions, wastewater techniques and technologies, costs and funding, environmental impacts, management approaches, project delivery systems and institutional arrangements.
- Pair candidate technologies/solutions with Needs Areas
- Provide a detailed Action Plan with recommended actions, costs, and scheduling based on town approved priorities
- Prepare conceptual-level designs and program outlines for the recommended plan

The Phase 2 process can be followed in detail through the content of the Citizens Advisory Committee (CAC) meeting minutes. The CAC held 9 committee meetings and 2 public meetings over 18 months in addition to subcommittee meetings held to focus on specific issues such as groundwater recharge near drinking water aquifers.

The CAC was instrumental in setting priorities and selecting solutions. The Project Team and CAC recognize that water resources are interconnected within Acton and its watershed. Therefore, considerable discussion and effort were involved in assessing the CWRMP's role in the long-term sustainability of Acton's overall watershed health.

The result is a holistic approach to management of drinking water, wastewater, storm water, and surface and ground water resources. The comprehensive nature of this report is due to input received from the CAC and residents, and the Town's long standing commitment to protecting its water resources, which is exemplified by the contributions from staff to this study.

The Town's historical focus on water resources protection has generated regulations, programs, and tools that form the foundation for the CWRMP and its recommendations. Examples of this focus are the Wastewater Management Plan produced by the Health Department in 1998 and the Health Department's surface water and ground water sampling programs.

Assessment of Alternatives

More than 80% of residents are served by individually owned and maintained onsite wastewater systems. The remainder of the town is served by a combination of a public sewer system and nine privately owned package wastewater treatment facilities. In February 2002, Acton opened the Middle Fort Pond Brook Wastewater Treatment Facility, a 250,000-gallon-per-day GPD sequencing batch reactor (SBR)-style facility, and 70,000 linear feet of sewer including 10 pumping stations. The system is designed to serve almost 10% of the community, with modular expansion capability to address future needs.

From this existing basis, the CWMRP assesses alternatives for the remainder of town not served by the central sewer. The assessment process can be described as a sequence of five steps that begin with large scale issues and work towards solutions to specific needs. Step 1 and Step 2 comprise Phase 1, while Phase 2 consists of Step 3 through Step 5.

Step 1 – Identify Needs in Acton using data from Board of Health records, CAC input, previous reports and studies, water 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.

Step 2 – Create Needs Areas based on the technical evaluation and on “non-technical” parameters. Technical criteria include regulatory setback requirements and design parameters. 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. 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.

Step 3 – Create Needs Planning Areas began the Phase 2 process by assessing the 15 Needs Area groupings developed in Phase 1. The areas were refined based on topography, underlying geology, and socio-economic boundaries, such as traditional neighborhood limits and economic growth areas.

Step 4 – Finalize Criteria Ranking by assessing the criteria. The CAC agreed that technical criteria all addressed environmental concerns and are therefore of equal rank, but some “non-technical” criteria are more important than others. Priority non-technical criteria include implementability; growth, especially economic growth in areas designated for growth; optimization of the current wastewater infrastructure and wastewater treatment facility (WWTF); and water reuse and recharge of groundwater/aquifers. These criteria are not explicitly attached to specific areas; rather they are primary criteria for all areas.

Step 5 – Rank Needs Planning Areas by identifying the criteria most important to each Needs Planning Area and prioritizing the Areas, followed by prioritization of solutions.

Evaluation of Alternatives

The CAC considered some solutions as not applicable. Generally, connection to the existing collection system for Needs Planning Areas north of Route 2, or construction of new collection and treatment system for Needs Planning Areas adjacent to the existing collection system are considered not feasible.

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.

The CAC understood the balance between available solutions and the ability to implement preferred solutions. The preferred solutions may not be readily implementable because of constraints such as cost or disposal capacity. Therefore, the goal of the assessment was to present the preferred solution with a menu of alternative solutions that address the underlying needs and present a framework for the 20-year planning period.

The CAC prioritized off-site solutions because on-site solutions, including establishing special wastewater management districts, are the default solution for all the service areas.

The High Priority areas ranked from highest to lowest priority are:

1. Powdermill Plaza (Area 7)
2. Spencer Road Tuttle/Flint/Mallard (Area 10)
3. West Acton Center (Area 12)
4. Indian Village (Area 13)
5. East Acton Village (Area 3)

Medium Priority areas are:

- North Acton Village/Marshall Crossing/Robbins Brook (Area 1)
- Brucewood Estates (Area 5)
- Maynard Border (8)
- Nash and Downey Roads (11)
- Colonial Acres / Flagg Hill (14)

Low Priority areas are:

- Handley Woods / North Acton Woods / Acorn Park / North Acton Condos (Area 2)
- Concord Road / Robbins Park (Area 4)
- Brookside Circle (6)
- Heath Hen Meadow (9)
- Acton Center (15)

Potential Solutions

The Needs Assessment demonstrates a need to address wastewater disposal issues within the Town of Acton. The potential solutions derived from the Phase 1 process include a combination of the following:

- Continued reliance on onsite wastewater systems (do nothing) under the existing management framework; by definition, the “do nothing” alternative is unsuitable for the Needs Areas but may be suitable for areas outside the Needs Areas.
- Continued reliance on onsite wastewater systems but with a town-driven management system that includes expanded monitoring and stricter treatment standards
- Cluster / Satellite collection and treatment systems
- Central collection with treatment at the Adams Street wastewater treatment facility
- Use of existing in-town private treatment facilities

Structural Solutions

The Phase 1 report identified four sites as potential locations for wastewater treatment and disposal systems, from which a scope for preliminary hydrogeologic site evaluation of the four sites was developed. A fieldwork program was implemented at the following sites to determine the capacity of each site to accept dispersal of water:

- Wetherbee Street / Route 2 – Service to High Priority Areas 3 and 4
- Adams Street – Potential expansion of the Adams Street WWTF
- High Street – Potential expansion of the Adams Street WWTF
- North Acton – Potential service to Medium Priority Area 1

As we looked for viable locations for discharge we recognized the value of the W.R Grace property, off Independence road, such as size, proximity, groundwater depths and soil types but ultimately did not choose to analyze the site because EPA's Record of Decision regarding the site's remediation had not yet been issued.

The most promising location, hydrogeologically, is the Wetherbee Street site, which is aligned with the East Acton Needs Areas (Area 3 and Area 4) as an offsite alternative. However, research into the availability of the parcel has uncovered a deeded legislative conservation restriction, which would return the parcel to Commonwealth control if used for purposes other than conservation.

The potential disposal areas have drawbacks that limit the Town's options. But, each Needs Area associated with the four dispersal locations has another viable solution in addition to construction of a satellite facility. Therefore, we do not recommend further hydrogeologic study as part of the CWRMP. We recommend that the Town clarify the availability of the Wetherbee Street site to determine if this parcel remains a viable alternative for East Acton.

Recharge/reuse of reclaimed water was investigated by a subgroup of the CAC, the Indirect Potable Reuse Working Group. Within the context of the Acton's 20-year CWRMP, reuse of highly treated wastewater treatment plant effluent was viewed as a potentially feasible aquifer recharge method, resulting in the preservation of the hydrologic cycle.

The Group suggested that further exploration of this alternative was warranted, and recommended a small scale pilot study at the Adams Street WWTF with discharge to the existing discharge beds, close coordination with state and federal regulators, and study of other programs implemented in the Western United States.

Extensions of the existing Middle Fort Pond Brook sewer system provide a feasible alternative to areas south of Route 2. The system was designed with additional capacity in anticipation of future needs. The wastewater treatment facility currently has a permit to discharge 299,000 gallons per day, of which approximately 50,000 gpd is available for future connections outside of the sewerage area.

The Town of Acton has entered into a design contract for the High Street Extension Project, which is expected to be constructed in summer 2006. This project is intended to allow the decommissioning of the existing treatment facility at Powdermill Plaza while servicing the remaining properties in this corner of Acton. This project will use approximately 7,000 gpd of available capacity, leaving about 43,000 gpd for future connections.

Non-Structural Solutions

The definition of a “Wastewater Management District” is varied according to the level of management implemented under the auspices of one of these programs across the country. Although the specifics of the individual programs may vary, the foundational principles are the same: *Greater levels of environmental protection through the delineation of a specific area within which the design, construction, operation, and maintenance of onsite wastewater treatment systems will be more closely regulated.*

Acton, because of its complete reliance on decentralized wastewater systems until the late 1990s and ongoing reliance on these systems for 90% of its population today, has always worked within a management structure that has matured over time into its current version.

The current Septage Management structure includes:

- The permitting and installation of conventional onsite systems – defined as a system with a septic tank and a soil dispersal area – in accordance with a set of prescriptive codes,
- A function-based inspection of systems at time of property transfer,
- Required lifetime operation and maintenance (O&M) contracts with reporting and effluent sampling requirements on advanced onsite treatment technologies, and
- A regulation requiring the pumping of conventional septic tanks at least once every two years.

Recommendations

The recommended solutions include a combination of the following:

- Continued reliance on onsite wastewater systems (do nothing) under the existing management framework for the majority of Acton,
- Continued reliance on onsite wastewater systems but with a town-driven management system that includes expanded monitoring and stricter treatment standards,
- Cluster collection and treatment systems,
- Expansion of the Middle Fort Pond Brook sewer system with treatment and disposal at the Adams Street treatment facility to address high priority areas and optimize the operation of system,
- Use of existing in-town private treatment facilities, and
- Continued monitoring of new technologies and opportunities over the course of the 20-year planning period for new solutions.

The current wastewater disposal system for the majority of the parcels in the Town of Acton will remain unchanged.

Sewer Extensions:

The Middle Fort Pond Brook sewer system should be extended to serve the following areas:

- High Street to Powdermill Plaza (Needs Area 7),
- Spencer/Tuttle/Flint neighborhood (Needs Area 10), and
- West Acton Center (Needs Area 12) including the Gates and Douglas Schools.

The capacity of the Adams Street treatment facility's disposal beds currently limits the sewer extensions beyond these areas. The West Acton Planning Area probably will not be served in its entirety, excluding the area west of the railroad right-of-way. However, final delineation of sewer areas should be conducted during a conceptual design phase.

Cluster Systems of Other Areas:

These Needs Planning Areas have existing private treatment facilities with unused capacity that could possibly be tapped for municipal use:

- Marshall Crossing / Robbins Brook (1)
- Nagog Woods/ Acorn Park / North Acton Woods (2)

Cluster/neighborhood shared systems should be instituted in the High Priority Area at East Acton Village (Needs Area 3) to provide economic growth opportunity while maintaining the village character. The focus of the Brookside (6) area should be to create shared systems in addition to the existing treatment facility remaining in service. Capacity limits in the existing system preclude the connection of the Nash and Downey neighborhood and Dover Heights (11). Therefore, the Dover Heights treatment facility should be upgraded to meet current regulations and the area should focus on cluster solutions, including a potential public-private solution at Dover Heights.

Recommended Wastewater Management Districts:

- Robbins Park (4)
- Brucewood Estates (5)
- Maynard Border (8)
- Heath Hen Meadow (9)
- Colonial Acres (14)
- Acton Center (15)
- West Acton Center (Needs Area 12) west of railroad right-of-way
- Indian Village (Needs Area 13)

Financing and Costs

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 any future projects. All of these measures were successfully implemented during construction of the first sewer infrastructure.

As the Town moves forward, it faces two hurdles in constructing additional sewer infrastructure. The first is identifying a revenue source that could be used as a cash flow device to finance the project prior to betterments being issued to the expansion area.

The second hurdle is an anomaly within the State betterment legislation. This legislation allows Towns to assess betterments by frontage, area, or use. In charging by frontage or area the

legislation allows for betterments to be redistributed when a system is expanded (in that way the new users pay for fixed costs like the treatment system construction). Unfortunately the user method is not provided that provision. In order to address this, the Town has submitted legislation that will allow all three methods of assessment the same mechanism to redistribute betterments.

The Engineers opinion of conceptual-level costs for design and construction of the sewers to the West Acton area is between \$8.0 and \$9.5 Million. With long-term (life cycle) costs included, the present worth of the West Acton sewer extension is estimated to be between \$9.0 and \$10.5 Million. The town expects to submit an application for a low interest construction loan to the State Revolving Fund in August 2006. Town meeting could appropriate design funds in fall 2006. Construction loan funds would become available by July 2007.

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.

The Engineers opinion of conceptual-level costs to implement Wastewater Management Districts and sustain the districts for 20 years is \$11.0 to \$13.0 Million in present worth dollars. This includes active management of the program by town staff and subcontractor services for tank pumping and inspections.