Chatham

COMPREHENSIVE WASTEWATER MANAGEMENT PLANNING STUDY

January 1999

INTRODUCTION TO THE SCOPE OF THE PROJECT

The Town of Chatham is in the process of conducting a Comprehensive Wastewater Management Planning Study (CWMP) that will recommend methods for treating and disposing of wastewater generated by all residents and businesses. Developing a plan that meets Chatham's wastewater disposal needs well into the next century and is consistent with state and deral law and the character of Chatham is of utmost importance to protecting public and environmental health. Without an effective wastewater treatment plan, public drinking water supplies and freshwater ponds and coastal embayments are at risk.

Chatham currently depends on a secondary wastewater treatment plant that serves approximately 5 percent of the properties in town, mainly in the downtown area. All the other properties are served by individual on-site cesspools and Title 5 septic systems.

These systems must serve the year-round population of 6,500 residents and the seasonal population that swells to over 20,000. The study will address issues that affect groundwater, freshwater and sensitive coastal embayments, such as how to protect local waters from excessive nitrogen loading; how to safely dispose of wastewater in low elevation areas where groundwater is close to the surface; whether existing systems can be modified to remove a greater amount of nitrogen; and how to implement any solutions without disrupting summer trade or the character of the Town. The Final Plan is likely to include a package of recommendations, perhaps combining some construction with zoning and land-use changes. Elements of the plan will be brought to Town Meeting for approval.

WHAT DOES THE STUDY INVOLVE?

The COMPREHENSIVE WASTEWATER MANAGEMENT PLANNING STUDY (CWMP) is comprised of four phases:

- Identifying the Town's existing and future wastewater treatment and disposal needs and environmental risks,
- Identifying and screening alternative solutions to meet these needs,
- Providing a detailed cost/benefit evaluation of the feasible alternatives, and
- Presenting a recommended plan for cost-effective and environmentally sound solutions that will be accepted and implemented by the Town's residents.

WASTEWATER MANAGEMENT PLANNING IN CHATHAM

The Town's wastewater treatment plant, located off Sam Ryders Rd., discharges treated effluent adjacent to the zones of contribution for Indian Hill and South Chatham water supply wells. Computer modeling indicates that effluent discharges of 100,000 to 150,000 gallons per day (gpd) might begin to flow into the zones of contribution of these water supply wells under severe drought conditions. As a result, the Massachusetts Department of Environmental Protection (DEP) and the Town of Chatham have entered into an agreement (Administrative Consent Order or ACO) to limit the discharge at 150,000 gpd annual average and to remove more nitrogen from the treated effluent. The plant now produces a very clean effluent with average nitrogen concentrations of 4 to 5 parts per million (ppm), which is well below the state drinking water standard of 10 ppm.

Because most of the wastewater in town is disposed through individual on-site systems, the Comprehensive Wastewater Management Planning Study, another requirement of the ACO, will focus a great deal on these types of systems, systems that remove nitrogen, and the Town's regulations to manage nitrogen inputs from these systems into the groundwater.

Alternative technologies and management plans will be identified and screened for the wastewater treatment plant, as well as for individual on-site systems and clusters of properties. The most feasible technologies and plans will receive a detailed evaluation to identify and develop the most cost-effective, most easily-managed and most environmentally-sound solutions.

The ACO with DEP has set deadlines for the completion of the management plan and for the construction of any facilities that might result from the study. The Draft Facilities Plan is due in April 2000 and the Final Facilities Plan in December 2000.

PEOPLE YOU SHOULD KNOW

Citizen's Advisory Committee, with area represented:

FRED JENSEN
Chairman, Central Chatham

HERBERT F. BERNARD
Morris Island, Stage Island & Little Beach

MORTON S. BREYER, MD
At-Large

PHILIP A. CHRISTOPHE
West Chatham

ROBERT E. DEPATIE
At-Large

RALPH LIGHTFOOT
Old Town

DEDE LOVETT
Sears Point

KEVIN J. MIKITA
Chathamport

CHARLES F. POLLARD
South Chatham

SCOTT TAPPEN
Stage Neck

Ex Officio:

CHRIS DIEGO
Chamber of Commerce

TIM LINNELL
Shellfish Advisory Committee

PATRICIA SIEWERT
Friends of Chatham Waterways

WILLIAM F. SCHWEIZER
Chatham Conservation Foundation

JAMES SCOTT
Water and Sewer Advisory Committee

NUTRIENTS – TOO MUCH OF A GOOD THING?

The case against nutrients

The negative impacts of nutrients on water quality have been identified as a particular concern for coastal communities such as Chatham, and they are a major focus of the Town's CWMP Study. The study will make recommendations on improved wastewater facilities and local regulations to minimize the impact of nutrient loading to sensitive areas, such as saltwater embayments and drinking water supply recharge areas.

Too many nutrients, particularly nitrogen and phosphorous, are not good for surface waterbodies because they promote excessive plant (algae) growth, which degrades water quality. This condition is often called "eutrophication." When the plants die and decay, they consume oxygen which kills fish or causes odors. The plants also settle to the bottom and destroy shellfish and eelgrass habitats.

Nitrogen is typically the limiting nutrient in saltwater habitats. This means that plant growth in these environments increases with increased nitrogen input, but it is not affected by phosphorous. On the other hand, phosphorous is typically the limiting nutrient in freshwater habitats, which means that plant growth in freshwater ponds increases with increased phosphorous input, but it is not affected by nitrogen.

Nitrogen is believed to travel through the soil in groundwater very freely. Typically, it emerges at coastal waters unchanged. Phosphorous is usually retained in the soil less than 100 feet from its source, and does not travel very far. Nitrogen is also not good for drinking water supplies. Nitrate nitrogen can cause methemoglobinemia (or blue baby syndrome) in infants.

Single problem, multiple sources

On the Cape, septic systems and cesspools are the primary culprits when it comes to sewage contributions to groundwater, ponds and coastal waters. Wastewater treatment plants also contribute to the problem. Road runoff, waterfowl, lawn and agricultural fertilizers, and natural atmospheric precipitation are also major sources of nutrients. In coastal areas, 63 percent of the nitrogen comes from septic systems and treatment plants. The problem of high nutrient levels is compounded by the cumulative impact of multiple sources. While nutrients are invisible, their adverse impacts to water quality are quite visible, unfortunately, not until it is too late. Warning signs of eutrophication include fish kills, bad odors, unusual water color, and prolific plant growth such as mats of seaweed or algae.

All water eventually finds its way to the ocean. In the Cape's sandy soils, nitrogen percolating down to the groundwater hitches a ride to the nearest downstream waterbody and, ultimately, to the coast. Once nitrogen passes through your septic system's leaching field, at a level of 35-40 ppm, it begins a journey that may take many years. Because the groundwater travels at a rate of approximately one foot per day, the negative effects of excessive nutrients may not be evident for decades. Nitrogen from the septic system of a house just a mile from the seashore will take more than 14 years to reach the coast. In less permeable soils, the march to the sea takes even longer. This makes it extremely difficult to raise awareness about the problem. The effects of the development boom of the 70s, for instance, are only now apparent. Long Pond, the Cape's largest freshwater body, is showing signs of degradation and Mashpee River has been called a "dying river."

DEP has set a nutrient limit of 10 ppm for the zones of contribution (the land area that drains into or recharges a ground or surface waterbody) for public drinking water supplies. Nutrient limits are more difficult to set for the watersheds to sensitive coastal embayments because each one is unique with individual tidal flushing characteristics and depth. Typically, nitrogen concentrations in most

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coastal embayments of 0.5 to 2 ppm will cause eutrophication.

Your septic system: Out of sight shouldn't be out of mind

Wastewater treatment and disposal in Chatham is accomplished primarily through individual, on-site septic systems or cesspools. Approximately 5 percent of the Town's properties are connected to the town wastewater treatment plant, which provides a high level of pollutant and nutrient removal. All the other properties use cesspools and Title 5 systems, which remove some of the sewage solids, but little of the nitrogen.

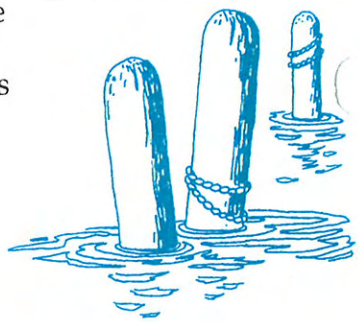
Title 5 systems utilize a septic tank that collects the heavier sewage solids and passes the liquids to the leaching (disposal) system. The solids collect for several years until they are removed as septage. The liquid (or septic tank effluent) is poorly treated and usually percolates quickly through the Town's sandy soils to the water table. The new Title 5 regulations are effective at reducing health threats from biological pathogens, but are not effective at removing nutrients.

CHATHAM'S WASTEWATER PLANNING TEAM

Chatham Selectmen have appointed a Comprehensive Wastewater Management Plan Citizen's Advisory Committee (CAC) made up of 10 people from all geographic areas of Town. Fred Jensen is the Chairman and he can be contacted at (508) 945-3076. The CAC assists a Technical Advisory Committee (TAC) for the study made up of the following professional Town staff:

- William Redfield, PE
  Water and Sewer Department Manager
- Terence Hayes, Health Agent
- Margaret Swanson, Town Planner
- Robert Duncanson, Ph.D
  Water Quality Laboratory Director

The CAC and TAC are assisting Stearns & Wheler Environmental Engineers & Scientists (S&W), the environmental engineering firm that is performing the study.



HOW CAN I BE INVOLVED?

- Documents developed for each phase will be submitted to DEP, the Massachusetts Environmental Policy Act Unit and the Cape Cod Commission. They will also be available for public review/comment.
- At the completion of each phase, the Town—together with the Cape Cod Commission—will hold public hearings to gather public comment and suggestions. CAC members and Town officials encourage residents to review the documents, provide input and attend meetings. Phase 1, the Needs Assessment, is nearing completion. The findings will be submitted for review in March and April 1999.
- To receive copies of documents or to pose questions on the project, contact Bill Redfield, Manager of the Water and Sewer Department, at (508) 945-5150. Meeting notices will be distributed to local newspapers and the project mailing list. To have your name included, call Bill Redfield at the number listed above.