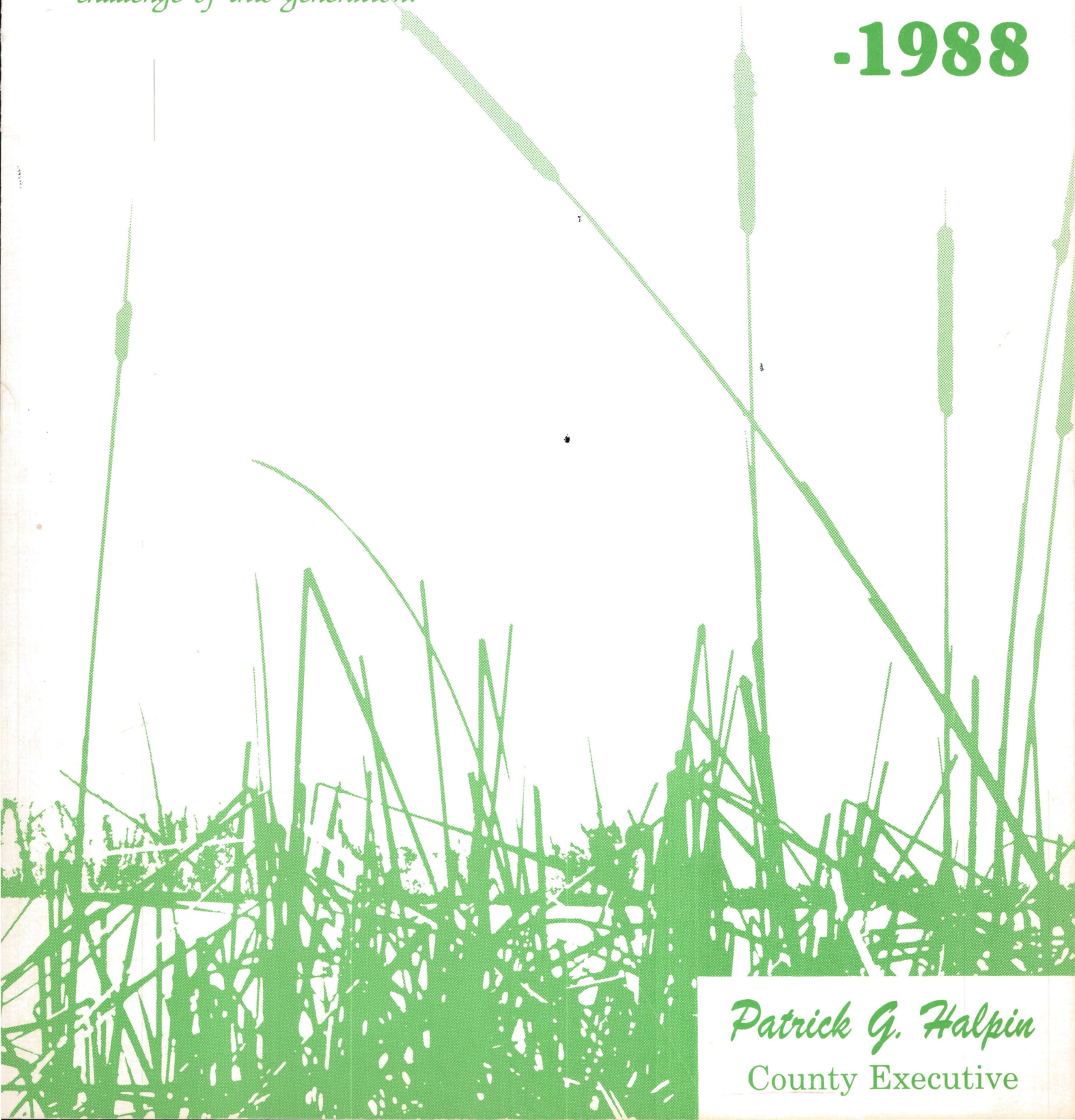
Report to the
SUFFOLK COUNTY LEGISLATURE

# ANNUAL ENVIRONMENTAL REPORT -1988

*"Preserving and protecting our environment is the challenge of this generation."*



*Patrick G. Halpin*
County Executive

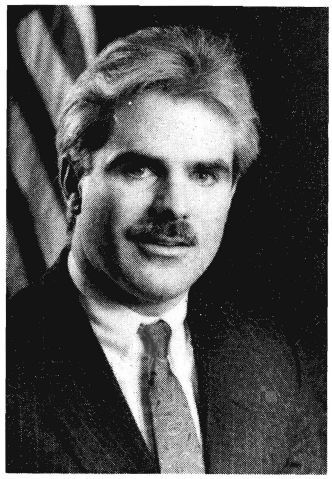
Report to the Suffolk County Legislature

by

PATRICK G. HALPIN
County Executive

# Annual Environmental Report

1988



# PREFACE

I am pleased to submit my first Annual Environmental Report to the Suffolk County Legislature and to the people of Suffolk.

The quality of life in Suffolk County, is among the best in the nation. This report outlines how we can work together to help keep it that way.

What has long attracted many to Suffolk is its propinquity to the New York City metropolitan area, combined with its semi-rural nature and its unparalleled access to the waters of the Atlantic and Long Island Sound.

But our advantageous geography also presents us with some unusual environmental problems. Among these is our dependence for basic subsistence and hygiene on the groundwater beneath us. This has forced upon us difficult decisions as we attempt to strike a balance between economic development and land preservation.

We must also grapple with the difficult problems involved with disposing of solid waste in an affordable way that will not further harm the groundwater aquifer or the environment.

This report outlines in detail the efforts we are making at the County level to meet these problems, including reviews of groundwater, surface waters, freshwater wetlands, marine resources, air quality, open space, solid waste, hazardous waste, energy, and environmental review and enforcement.

This year I have attempted to move vigorously to meet these challenges. I have put particular emphasis on groundwater protection, toxic and hazardous waste cleanup, and the solid waste disposal crunch caused by the State law ordering all Long Island landfills closed by 1990.

While my Clean Drinking Water Protection Program borrows from my predecessor's in that it provides for the extension of the 1/4 cent sales tax, due to expire in 1989, for 10 years and the dedication of the approximately $570 million to be generated to buy thousands of acres of environmentally sensitive lands, there are two essential improvements:

First, it allows the county to issue bonds so we can purchase appreciating land at lower prices than if we waited for sales tax revenue and move expeditiously to acquire land that is in imminent danger of development.

Second, it creates an Environmental Trust Fund with a law enforcement strike force and a toxic waste *Superfund* to accelerate the cleanup of hazardous waste dumps and to assist the towns in capping and closing landfills. This represents the first time that the County has offered to step in and aid towns in closing landfills.

My proposal has been adopted by the County Legislature, authorized by New York State, and now is being presented to the voters in a referendum next month. By passing this measure, Suffolk residents will be assuring a clean drinking water supply by both saving open space and cleaning up toxic waste dumps and landfills.

To assist in managing the county's solid waste crises, I will be exploring the county's options identified for us in the July 1 report of the Suffolk County Recycling Commission.

Recycling has been identified in the New York State Solid Waste Management Plan as the most important element in solving our solid waste problem. My 1989 operating budget proposal incorporates the recommendation of the Commission for a recycling coordinator.

I recommend funding this new position, with support staff, to oversee the County's role in establishing markets for recycled materials, encouraging private enterprise to recycle components of the waste stream which are now disposed of in landfills or illegally in parks, streams and on vacant land, coordinating recycling activities among the towns to achieve economies of scale through regional approaches to recycling, and to guaranteeing that Suffolk County takes full advantage of state and federal Grant funds available for recycling purposes. Recycling is proving to be a sound approach to solid waste disposal and the efforts in this area should and will continue.

It is essential that the County of Suffolk take definitive steps to assure that its priceless natural resources, including the marine environment, inland freshwater and open spaces and wetlands are conserved and protected.

The government of Suffolk County has been a dynamic, innovative force on environmental issues for many years. We were the first in the country to enact a returnable beverage container deposit law to reduce our waste stream, prevent litter, and promote recycling.

Already this year I have signed into law landmark legislation prohibiting the use of polystyrene and polyvinyl chloride products by retail food establishments as part of an effort to prevent non-biodegradable products from coming into our landfills. Additionally,

I recently signed legislation for mandating deposits to encourage return of used car batteries. We are also considering similar legislation for used car tires and other items in the solid waste stream.

We are continuing to fund studies on incinerator ash disposal, toxic dump sites, and the solid waste stream. We are revising our Standard Operating Procedure for compliance with the State Environmental Quality Review Act to ensure that county activities will be subject to the strictest review for their environmental impacts.

I am confident that, working together, all the branches of Suffolk County government will continue to build upon this long history of progressive, innovative, and effective management of our very delicate environment. The problems we face in the coming years make this cooperative effort imperative.

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# GROUNDWATER AND WATER SUPPLY

## INTRODUCTION

Water supply problems caused by groundwater contamination and the need for improved watershed protection measures continued to be major environmental issues during 1987. Over 340 private wells were found to exceed drinking water guidelines for organic chemicals or pesticides. Public water was extended to five communities under the Federal Superfund Program; another eight communities, including two areas of Rocky Point totalling 300 homes, await approval or completion of Federal actions. In addition, two more public supply wells had to be shut down due to contamination, and new, more stringent Federal and proposed State regulations are projected to significantly increase both the number of future well closures and the required surveillance monitoring effort.

In response to these challenges, the County proposed an extensive Watershed Protection Program that was overwhelmingly endorsed by the voters in November. The County also completed an updated *Comprehensive Water Resources Management Plan* that defines a strategy for ensuring an adequate and safe water supply for Suffolk residents. This strategy involves measures to protect the groundwater resource, such as public education on water conservation and toxic household waste disposal. The plan also includes structural and nonstructural measures for providing potable water to residents whose wells have seen impacted by groundwater contamination. In addtion, the county initiated detailed watershed planning for *Special Groundwater Protection Areas* has also been initiated under a State grant program.

The following sections focus on the issues and events of 1987 that affected the status and management of Suffolk's sole-source groundwater resource and water supply system. The first section discusses trends in groundwater levels, pumpage volumes, water quality, and the levels of building activity (reflected in the number of permit applications) that have a bearing on groundwater and water supply management. This is followed by reviews of laws passed and regulations promulgated during 1987, as well as those proposed for 1988, and descriptions of recently completed or on-going studies and programs. The final sections describe the status of recommendations made in the 1987 report, and present new recommendations for 1988.

## TRENDS

### 1. 1987 Groundwater Levels

Groundwater levels (water table elevations) in Suffolk County remained below their long-term average during 1987, following a third straight year of below-average precipitation (Table 1; also see the *ATMOSPHERIC CONDITIONS* section of this report). A relatively dry summer and fourth quarter more than offset the effects of a wet first quarter, and by year's end water levels were again approaching the lows observed during the 1980-82 *mini-drought.*

The SCDHS takes quarterly water table elevation measurements at over 500 monitoring wells located throughout the County, and produces an annual water table map based on March groundwater levels. The SCDHS also conducts quarterly monitoring of streamflows and stream headwater locations within the area of the Southwest Sewer District in order to determine the need for streamflow augmentation. Thus far, yearly fluctuations in water table elevations due to changes in rainfall patterns have overshadowed any changes that may have occurred as a result of sewering.

**TABLE 1**
**Average Annual Precipitation**
**Based on Combined Data From**
**Belmont Lake, Medford, and Riverhead**

| Year | Total |
|---|---|
| 1975 | 51.1" |
| 1976 | 37.8" |
| 1977 | 49.3" |
| 1978 | 45.4" |
| 1979 | 53.0" |
| 1980 | 32.0" |
| 1981 | 36.4" |
| 1982 | 40.0" |
| 1983 | 56.2" |
| 1984 | 52.1" |
| 1985 | 33.6" |
| 1986 | 38.6" |
| 1987 | 37.1" |
| AVG | 43.3" |

A Magothy aquifer potentiometric surface map for March 1987 was prepared by the SCDHS based on measurements at specially constructed test well clusters. This map indicates a 4 to 8 foot decline near the groundwater divide in western Suffolk since the record high measurements of 1979 (as published by the USGS). It also indicates that the Peconic and Carmans Rivers have a more significant influence on the deep groundwater flow patterns than previously believed. Annual updates and improvements in map resolution are planned.

### 2. Community Public Water Supplies

An estimated 60,000 additional persons were served by public water supplies during the period 1985-87 (Table 2). This rate is more than 50 percent greater than that experienced during the prior five year period, and reflects both the rapid pace of new residential development during the past two years (see Section 4. *Applications and Permits*) and the results of various programs designed to extend public water mains to existing development impacted by groundwater contamination.

The Suffolk County Water Authority (SCWA) and the nine next largest systems -- S. Huntington, Greenlawn, Dix Hills, Brentwood, E. Farmingdale, Riverhead, Shorewood, Hampton Bays, and Greenport -- supply over 90 percent of County residents on public water, who represent about 85 percent of Suffolk's total population of 1.4 million.

**TABLE 2**
**Public Water Supplies:**
**Services and Population**

| | SCWA* | | Other** | | Total | |
|---|---|---|---|---|---|---|
| Year | Serv | Pop | Serv | Pop | Serv | Pop |
| 1970 | 187,000 | 653,000 | 40,000 | 147,000 | 227,000 | 800,000 |
| 1975 | 226,000 | 764,000 | 48,000 | 171,000 | 274,000 | 935,000 |
| 1980 | 247,000 | 815,000 | 52,000 | 185,000 | 299,000 | 1,000,000 |
| 1985 | 272,000 | 890,000 | 57,000 | 200,000 | 329,000 | 1,090,000 |
| 1987 | 286,000 | 944,000 | 59,000 | 206,000 | 345,000 | 1,150,000 |

*For the fiscal year ending the following May 31st. Includes on the order of 9,000 services and 30,000 persons served by the Smithtown, St. James, and Stony Brook Water Districts, which purchase their water from the SCWA.

** Totals for the nine largest systems after SCWA (see text).

The SCDHS continued to monitor over 700 community public water supply wells. Bacteriological and inorganic chemical samples, and carbamate pesticide samples for East End wells, were collected on an annual basis.

Organic chemical samples were collected semi-annually, except for 80 wells with a history of low-level contamination, which were sampled quarterly (as has been the practice since Fall 1985). This sampling supplements self-monitoring programs required of the water purveyors.

Two SCWA wells were closed during 1987 due to the presence of organic contamination (Table 3) -- Douglas Ave., Northport (trichloroethylene), and Crystal Brook Hollow Road, Mt. Sinai (benzene). This brought to 35 the total number of community wells placed in the *restricted* category (to be used only in case of emergency) since 1977.

**TABLE 3**
**Community Supply Wells Restricted Due to Organics: 1987**

| Year | No. | Communities |
|---|---|---|
| 1977 | 11 | N. Amityville (3)*, Amityville++, Bohemia, Centerport, C. Islip, E. Farmingdale, Holbrook (2)**, Huntington** |
| 1978 | 5 | Bohemia, Centerport, Central Islip, Smithtown, South Huntington+ |
| 1979 | - | -- |
| 1980 | 6 | Bay Shore, Brentwood*, Brookhaven Lab (Upton), East Northport+, L. Ronkonkoma**, S. Huntington+ |
| 1981 | - | -- |
| 1982 | 2 | Islip, Melville** |
| 1983 | 2 | Oakdale (2) |
| 1984 | 3 | East Hampton (2)+, Middle Island* |
| 1985 | 1 | Brentwood |
| 1986 | 3 | Brookhaven Lab, Dix Hills, Miller Place |
| 1987 | 2 | Northport, Mt. Sinai |
| | 35 | |

* Wells abandoned.
** Wells now in reserve category.
\+ Unrestricted--treatment now provided.
++ Unrestricted--water quality improved.

Pesticide contamination has necessitated the installation of large-capacity granular activated carbon (GAC) treatment units at four public well fields: SCWA Long Springs Road Well Field, Southampton (*aldicarb*); Greenport Water District Fields No. 6 and 7 (*aldicarb*); and, in 1987, Dix Hills Water District Field No.1 (*dichloropropane*). Pesticide (*aldicarb*) concentrations exceeding the 7 ppb drinking water guideline were also detected at the Mecox Landings Condominium during 1987.

Chloride concentrations continued to increase at numerous Greenport Water District wells due to saltwater encroachment, which has been exacerbated by increased pumping demands and dry weather conditions. Within the distribution system, chloride concentrations occasionally approached or exceeded the drinking water standard of 250 ppm. (Note: Greenport already provides system-wide notification that nitrate concentrations at times exceed the 10 ppm drinking water standard.)

Three marginal community water suppliers were taken over by larger systems during 1987. The Captain Kidd Water Company in Mattituck, which was purchased by the SCWA, will be upgraded and operated as an independent satellite system. The Greis Mobile Home Park in Ronkonkoma was connected to an extension of SCWA mains, and the Oak Park Mobile Home Park in Wading River was connected to the Shorewood Water Corporation. Of the remaining marginal community water suppliers, the largest are Greenport Water District (7,000 population), and North Shore Water Company (4,000 population).

### 3. Private and Non-Community Wells

The SCDHS collected samples from over 10,000 private and 520 non-community public wells during 1987, up slightly from previous years. The non-community well sampling program focused on high-priority systems, such as those serving schools, seasonal residences, and state and county parks.

One hundred private and non-community wells exceeded drinking water guidelines for organic chemicals, bringing the total to over 1,100 since SCDHS monitoring began in 1977 (Table 4). These 100 wells represent about two percent of the wells tested, which is somewhat less than the 3 percent averaged over the previous nine years. This difference reflects a shift in monitoring efforts from the western portions of the County, which are increasingly served by public water, to less densely developed areas in central and eastern Suffolk.

Sampling of private and non-community wells for the carbamate pesticides *aldicarb*, *carbofuran*, and *oxamyl* was intensified during 1987 to cover areas located farther away from farm fields. Over 240 wells (10.9% of the wells tested) exceeded drinking water guidelines, bringing the total to 3,104 (13.2% of wells tested) since monitoring began in 1980 (Table 4). These results reflect the continued movement of pesticide contamination (with little breakdown) through the groundwater system.

**TABLE 4**
**SCDHS Private and Non-Community Well Sampling**

| Year | -Organic Chemicals- Samples* | Wells Exceed | -Carbamate Pesticides- Wells | Wells Exceed |
|---|---|---|---|---|
| 1977 | 18 | -- | -- | |
| 1978 | 794 | 145 | -- | -- |
| 1979 | 1,925 | | -- | -- |
| 1980 | 2,682 | 149 | 8,345** | 1,151 |
| 1981 | 4,459 | 127 | 624+ | 200 |
| 1982 | 3,740 | 109 | 2,534 | 299 |
| 1983 | 5,045 | 122 | 3,891 | 536 |
| 1984 | 4,525 | 94 | 2,843 | 296 |
| 1985 | 4,053 | 181 | 2,042 | 257 |
| 1986 | 4,401 | 108 | 1,075 | 122 |
| 1987 | 5,018 | 100 | 2,228 | 243 |
| **Total** | **36,660** | **1,135** | **23,582** | **3,104** |

* Includes about 10% repeat samples.
** Samples analyzed by Union Carbide (UC) labs.
\+ *Aldicarb* analyzed by UC;
*carbofuran* by Food Machinery Corp. (FMC).

Monitoring continued at the Riley Avenue School, where pesticide (EDB) contamination was detected in 1984; raw water and GAC-treated samples were analyzed to ensure student safety. The monitoring of 12 non-community supplies (mostly co-op motels) in Napeague was continued as the extension of public water mains was delayed; intermittent bacteriological and chloride problems continued to be detected.

### 4. Applications and Permits

The number of subdivision map applications received by the SCDHS continued to increase in 1987 (Table 5). The exact percentages of subdivision homes with individual private wells and septic systems are not available for 1987, but are believed to be similar to those in 1986. The average number of lots per filed map, however, decreased somewhat from the previous year.

Single-family residential construction activity on unsubdivided lots remained very steady during 1986 and 1987 (Table 5). The percentage of new houses utilizing private wells dipped slightly, while the percentage utilizing cesspools remained constant.

Commercial/industrial building applications received by the SCDHS increased by less than 10 percent during 1987 (Table 5). The percentage of applications involving large sewage discharges (over 1,000 gpd) requiring SPDES permits, however, increased from 25 to almost 40 percent.

**TABLE 5**
**Approvals and Permits**

| | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|---|
| **Subdivisions*** | | | | | | |
| # of maps approved | 119 | 237 | 323 | 604 | 712 | 1035 |
| % with private wells | 34% | 63% | 30% | 18% | 33% | N.A. |
| % with septic systems | 82% | 92% | 70% | 69% | 87% | N.A. |
| Total # of lots proposed | 1384 | 2455 | 2301 | 4139 | 9963 | 8686 |
| **Single-Family Residential Construction** | | | | | | |
| Total # of appl. received | 2282 | 3846 | 5441 | 7843 | 8512 | 8505 |
| % with private wells | 44% | 32% | 34% | 32% | 33% | 29% |
| % with septic systems | 84% | 81% | 76% | 71% | 79% | 79% |
| **Comm/Ind and Multi-Family Residential Construction** | | | | | | |
| Applications received | 340 | 415 | 573 | 629 | 710 | 753 |
| New SPDES permits** | 143 | 144 | 82 | 176 | 168 | 281 |

* Includes *developments* (subdivisions less than 5 lots).
** SCDHS permits issued for sanitary sewage discharges over 1,000 gpd.
N.A. - Not Available.

## LAWS AND REGULATIONS

### 1. Federal

The *Safe Drinking Water Act of 1974* (Public Law 93-523) and 1986 amendments (PL 99-339) required the *United States Environmental Protection Agency* (USEPA) to establish drinking water standards. Until recently, however, few standards had been established for organic chemicals. In the absence of Federal standards, the *New York State Department of Health* (NYSDOH) developed its own guidelines, which are non-enforceable limits used to identify the suitability of water for drinking purposes and the need for treatment or other remedial actions. The NYSDOH has been using a general guideline limit of 100 ppb for total organics and 50 ppb (with some lower exceptions) for individual organics.

In June 1987 the USEPA issued enforceable drinking water standards or *Maximum Contaminant Levels* (MCLs) for eight volatile organic compounds (Table 6); an MCL for *tetrachloroethylene*, which has impacted many Suffolk wells, is expected to be proposed during 1988. Each large community supplier will be required to monitor its wells for these compounds on a quarterly basis starting in 1988; smaller community systems (serving less than 10,000 people) be required to phase in monitoring over a three year period. In addition, all systems will also have to adhere to self-monitoring requirements for an array of unregulated volatile organics.

A newly created class of suppliers -- non-transient non-community systems, which regularly serve 25 or more people during at least six months of the year -- will also have to provide quarterly monitoring for the organics listed in Table 6, and at least annual monitoring for the unregulated organics. It is anticipated that the SCDHS will initially provide the organics monitoring for such systems serving less than 1,000 people.

**TABLE 6**
**USEPA and Proposed NYSDOH Organics Standards**

| Compound | USEPA | NYSDOH |
|---|---|---|
| trichloroethylene | 5 | 5 |
| 1,1-dichloroethylene | 7 | 5 |
| vinyl chloride | 2 | 2 |
| 1,1,1-trichloroethane | 200 | 5 |
| 1,2-dichloroethane | 5 | 5 |
| carbon tetrachloride | 5 | 5 |
| benzene | 5 | 5 |
| p-dichlorobenzene | 75 | 5 |

All limits in parts per billion (ppb).

The MCLs listed in Table 6 are being utilized by the SCDHS, even though they have not yet been formally incorporated into Part 5 of the State Sanitary Code. It should be noted that in early 1988 the New York State Department of Health proposed to replace the generic organics guideline of 50 ppb with a standard of 5 ppb (Table 6), and to require quarterly monitoring of both regulated and unregulated compounds.

The potential impacts of these new standards on the status of Suffolk's water supply, and on the surveillance monitoring workload, could be significant. The SCDHS estimates that the new USEPA standards could necessitate the closure or treatment of nine additional public supply wells, and could more than triple the number of private wells exceeding limits; the proposed NYSDOH generic standard of 5 ppb could force the closure or treatment of 45 additional public supply wells, and could result in a more than 10-fold increase in the number of private wells exceeding limits. In either case, since most of the standards are near analytical detection limits, surveillance monitoring requirements for marginal wells will increase significantly.

### 2. New York State

Laws related to water supply management and groundwater protection that passed during the 1987 session of the New York State Legislature included the following:

- *SOLE-SOURCE AQUIFER PROTECTION (Chap. 628, L. 1987): The Environmental Conservation Law (ECL) was amended by adding Article 55, which establishes a process for designating Special Groundwater Protection Areas (SGPAs) within Federally designated sole-source aquifers, and provides matching grants (75%-25%) to municipalities for the preparation of groundwater management plans. Seven Suffolk SGPAs were designated, and the Long Island Regional Planning Board was granted $300,000 to develop comprehensive plans (see STUDIES and PROGRAMS).*

- *WATER SUPPLY EMERGENCY PLANS (Chap. 590, L. 1987): The Public Health Law (PHL) was amended by adding Section 1125, which requires all water purveyors with annual gross operating revenues in excess of $125,000 to prepare water emergency management plans by December 1990. Such plans must cover the loss of electric power or loss of capacity due to well contamination, and must be accepted by the NYSDOH, with revisions every five years.*

Legislation developed by the Joint Legislative Commission on Water Resource Needs of Long Island to be submitted (or resubmitted) during the 1988 regular session include the following:

- *TRANSFER OF DEVELOPMENT RIGHTS: The Town Law, Village Law, and General Municipal Law would be amended to clarify the authority of municipalities to use transfers of development rights (TDRs) to protect critical resource areas such as watersheds. (S.782/A.1364)*

- *INDUSTRIAL DEVELOPMENT AGENCY LOANS: The ECL would be amended to prohibit the lending of public funds to facilities that are presently polluting the environment or are not designed to meet standards. (S.2469/A.3316)*

- *SPDES PERMITS: The ECL relating to the* State Pollution Discharge Elimination System *(SPDES) would be amended to tighten testing and reporting requirements, and suspension and revocation provisions. (S.2470/A.3340)*

- *FLUORIDATION TREATMENT: The PHL would be amended to require public hearings prior to NYSDOH decisions on applications to add fluoride compounds to public water systems. (S.2471/A.3341)*

- *WATER SUPPLY TAX CREDIT: The Tax Law would be amended in order to allow a New York income tax credit of 55 percent to homeowners whose wells have become contaminated. This credit would cover a portion of the cost incurred in purchasing water purification units, drilling new wells, redrilling existing wells, or obtaining public water. (S.2827/A.3713)*

- *DEFINITION OF DISCHARGE: The ECL would be amended to broaden the legal definition of* discharge to water *to facilitate prosecution of parties releasing potentially polluting substances onto or into the ground, without having to demonstrate actual groundwater or surface water contamination. (S.2829/A.3711)*

- *CERTIFICATION OF ADEQUATE SUPPLY: The ECL would be amended to require the builder of a multiple dwelling, commercial, or industrial building, to obtain a certificate from the local water supplier indicating that sufficient water is available to meet the increased demand. (S.2830/A.3710)*

- *WATER CONSERVING FIXTURES: The ECL would be amended to broaden water saving performance standards on fixtures such as water fountains, faucets, and urinals installed, sold, or distributed. (S.2832/A.3708)*

- *WATER CONSERVATION TAX CREDIT: The Tax Law would be amended to establish a State tax credit of 55% of the cost incurred when buying and installing a NYSDEC approved water conservation system in a single-family dwelling, and three thousand dollars or 25% of the cost for other than a single-family dwelling. (S.3153/A.4173)*

- *PESTICIDE CONTAINER REFUND: The ECL and State Finance Law would be amended to require refundable containers for restricted-use pesticides and a NYSDEC tracking system to ensure proper disposal. (S.4584/A.6428)*

- *WATER TREATMENT UNITS: The PHL would be amended to create a NYSDOH administered testing, registration, and labeling program for water treatment units. (S.3286/A.4520)*

- *SAFE DRINKING WATER ACT: The ECL and PHL would be amended to prohibit the discharge of chemicals known to cause cancer or birth defects (rather than allowing discharges based on risk assessments), and to require public notification of any discharges of such chemicals. (S.5559/A.7656)*

- *WATER WELL TESTING: The PHL would be amended to require a quality analysis of private well water prior to the sale (or resale) of a one- or two-family residential dwelling. (S.5871/A.7597)*

- *INCOMPATIBLE USE FUNDING: The ECL would be amended to define primary public water supply aquifers and principal aquifers, and provide funding for the development of regulations to restrict or prohibit incompatible uses over such aquifers (as authorized by previous laws). (S.5872-B/A.7594-B)*

- *WATER CONSERVATION AUDITS: The ECL would be amended to establish a water conservation audit program by requiring Long Island water suppliers to offer such audits to multi-family, commercial, and industrial customers at a reasonable fee. (S.5873/A.7593)*

- *SEWAGE TREATMENT WORKS: The ECL would be amended to require projects applying for Federal or State assistance for sewage treatment plant construction and operation to incorporate measures to conserve water within the sewer districts. (S.5878/A.7592)*

- *WATER METERING: The General Municipal Law, Public Authorities Law, and Public Service Law would be amended to require all public water suppliers to foster water conservation by metering all services and eliminating flat rate accounts. (S.5948/A.7634)*

### 3. Suffolk County

#### Water Protection Program

Resolution No. 721-1987, adopting a Charter Law for Pine Barrens Acquisition, protecting Suffolk's drinking water supply, and providing County-wide real property tax relief through the use of sales tax revenues generated by a proposed extension of the current 1/4% County sales tax, was overwhelmingly approved by the voters of Suffolk in November 1987. The program will include:

A county initiative to adopt a Charter Law for pine barrens acquisition, protecting Suffolk's drinking water supply, and providing County-wide real property tax relief through the use of sales tax revenues generated by a proposed extension of the current 1/4% County sales tax, was overwhelmingly approved by the voters of Suffolk in November 1987. The program will include:

- land acquisition in the Pine Barrens and other Special Groundwater Protection Areas,

- town revenue sharing for the purpose of land acquisition, capping and closing municipal solid waste landfills, and the identification, characterization, and remediation of toxic and hazardous waste sites,

- other water quality protection programs including water sewer district improvements, wastewater treatment, and land management,

- payments in lieu of taxes, and

- stabilizing County real property tax rates.

Additionally, this Program uses the sales tax proceeds of the last year of the currently imposed quarter cent sewer district tax and, thus, guarantees repayment to the sewer district of those funds, with interest, on an as needed basis.

State legislation, Bill S-9133, which will allow implementation of Suffolk County's water protection program has been signed by the Governor and will be put before the voters in November 1988.

Through adoption of this legislation the County will have the financial resources necessary to undertake a comprehensive groundwater preservation and management program. The extension of the one-quarter of one percent sales tax authorization to the year 2000 is expected to generate $570 million. The largest portion of this funding would be used to acquire about 30,000 acres of environmentally sensitive land in the Pine Barrens and other critical watershed areas. These lands will be maintained in their natural state. This will insure that the current water quality is preserved and that adequate and pure water recharge occurs in protected areas.

**Water Main Extensions**

Resolution No. 757-1986 of the Suffolk County Legislature created a Capital Reserve Fund of $5 million for the extension of public water mains to communities where groundwater contamination threatens public health, safety, and welfare. County expenditures from the fund must be matched on a dollar- for-dollar basis by the pertinent municipalities. The resolution established a Suffolk County Public Water Works System Review Committee to screen applications for County funds based on such factors as the number of homes affected, the type and severity of pollution problems, and project cost. Over 100 applications, involving about 5,000 homes, had been submitted to the committee by the April 1987 deadline. Matching funds for the recommended projects, which totaled $10 million, were allocated by the legislature during the summer of 1987 (Table 7). The legislature also earmarked an additional $2 million for matching funds, which will be applied to new applications received through March 1988.

**TABLE 7**
**Approved Water Main Extensions - 1987**

| Muncipality | Cost ($) |
|---|---|
| **Town** | |
| Babylon | 165,000 |
| Brookhaven | 3,980,000 |
| East Hampton | 442,000 |
| Huntington | 248,000 |
| Islip | 2,101,000 |
| Riverhead | 1,928,000 |
| Smithtown | 542,000 |
| **Village** | |
| Asharoken | 359,000 |
| Islandia | 102,000 |
| Southampton | 133,000 |
| | $10,000,000 |

***Private Wells***

Revised standards and procedures for Private Water Systems were issued by the SCDHS in January 1988. The revisions are designed to better protect the health of those who must rely on private wells for their source of drinking water, and expand the scope of the regulations to include multi-residential (e.g., two-family) and commercial/industrial water supply wells that are too small to be classified as non-community public systems.

The revisions increase the distance over which hookup to public water will be required from 100 to 150 feet, and increase to 150 feet the required separation distance between wells and cesspools for subdivisions approved by the SCDHS after March 1, 1988. The revised regulations now include subdivision test well procedures, and a revised list of acceptable water treatment methods.

## STUDIES AND PROGRAMS

### 1. Federal

Since 1985, funds for water main extensions have been made available by the USEPA under the *Comprehensive Environmental Response, Compensation and Liability Act of 1980* (CERCLA, also known as SUPERFUND). These funds are provided where contamination concentrations in at least one private well exceed Health Advisory Levels, which are usually higher than those specified by drinking water standards and guidelines.

Through January 1988, water mains have been extended at ten sites at a total cost of over $2.2 million; 238 affected homes, as well as numerous other homes along the routes of the mains, have been provided access to public water (Table 8). Bottled water is being provided in four other cases involving a total of 454 homes until permanent solutions can be implemented (Table 8). The SCDHS continues to provide technical support for the program by testing private well water quality, and investigating the source and extent of groundwater contamination.

**TABLE 8**

**Status of Federal Superfund Projects: February 1988**

| Year | Community | Location | # Homes* | Cost ($) |
|---|---|---|---|---|
| 1985 | Sag Harbor | Carrol St | 25 | 461,000 |
| 1986 | Bay Shore | Washington Ave | 59 | 241,000 |
| | Bohemia | Lincoln Ave | 10 | 92,000 |
| | Deer Park | Sammis Ave | 6 | 36,000 |
| | Westhampton | Jagger La | 81 | 596,000 |
| | | | 156 | 965,000 |
| 1987 | Amityville | Harrison Ave | 4 | 54,000 |
| | E. Patchogue | Gazzola Dr | 5 | 125,000 |
| | Lindenhurst | 48th St | 10 | 134,000 |
| | Port Jeff. | Lincoln Ave | 4 | 20,000 |
| | Shirley | Broadway | 34 | 481,000 |
| | | | 57 | 814,000 |
| **TOTAL THROUGH 1987** | | | **238** | **2,240,000** |
| 1988 | Amityville | Miller Ave | 5 | B |
| | Bridgehampton | Ellen Ct | 15 | A |
| | East Moriches | Pine St | 70 | B |
| | F. Salonga | Brookfield Dr | 88 | C |
| | Orient | Dock Rd | 1 – | A |
| | Rocky Point | Friendship Dr | 146 | B |
| | Rocky Point | Noah's Path | 150 | B |
| | Shirley | Merrick Rd | 32 | A |

* No. of affected homes hooked up to public water mains.
– Business.
A - USEPA presently reviewing.
B - Bottled water provided by USEPA; public mains expected in the spring of 1988.
C - Bottled water provided by USEPA.

**2. New York State**

Article 12 of the New York State Navigation Law was amended in April 1985 (effective October 1985) to transfer responsibility for the State's Environmental Protection and Spill Compensation Fund from the Department of Transportation to the Department of Environmental Conservation. All phases of the Oil Spill Program are now administered by the NYSDEC, including emergency response, clean-up supervision, and fund management (see the *TOXIC and HAZARDOUS WASTE* section of this report).

**3. Long Island Regional Planning Board**

- *SOLE SOURCE AQUIFER REVIEW: The Long Island Regional Planning Board has a memorandum of understanding with EPA to review all federally funded projects for impacts on the Island's sole source aquifer. LIRPB staff distributes the applications to all involved agencies and if any problems are perceived, then an attempt is made to have the applicant remedy them, otherwise EPA is notified.*
- *SPECIAL GROUNDWATER PROTECTION AREA STUDIES (SGPA) (205-J Extension): In 1987 the state passed legislation requiring the study of 7 special groundwater protection areas in addition to the 2 already done under the 205-J Study as discussed in the 1987 Annual Environmental Report. A report on the Special Groundwater Protection Project, known as 205-J, was published by the LIRPB in 1987. The 7 new SGPA areas currently under study are North Hills in Nassau County, along with West Hills-Melville; Oak Brush Plains, South Setauket Woods, Central Suffolk Pine Barrens, South Fork Pine Barrens, and Hither Hills Woods in Suffolk County. An additional study area in Southold is currently being considered. The following special tasks were outlined in the original scope of services for the study of the 7 new SGPA areas:*
  - *Identify criteria for SGPA's and the relationship between them and deep aquifer recharge areas.*
  - *Set study area boundaries commensurate with the criteria developed.*
  - *Identify municipal jurisdictions within the SGPA's.*
  - *Describe the SGPA's in terms of land use, public vs private ownership, zoning, land subject to future development, existing and future demographics, groundwater and surface water characteristics and quality, terrestrial environmental characteristics, existing water supply and sewage districts, as well as historic and archaeological resources.*
  - *Consider existing plans likely to effect SGPA's.*
  - *Develop groundwater management plans for the 7 SGPA's.*
  - *Initiate implementation of SGPA management plans.*
  - *Provide adequate opportunities for public participation and problem identification, and development of the management programs.*
  - *Prepare a final report.*

**4. Suffolk County**

**Suffolk County Planning Department**

- *SGPA (205-J): During 1987 under contract with NYSDEC, Suffolk County Planning Department staff initiated work on the SGPA study areas as required by the state. Criteria for SGPA's were developed and the study area boundaries set. In addition, field work was begun to compile information concerning land use, ownership, etc., in order to describe the various SGPA's. The study is currently ongoing.*
- *Pine Barrens Review: During the course of the year the Suffolk County Pine Barrens Review Commission continued to meet to review applications on subdivisions, zoning changes and special permits as submitted by the various municipalities pursuant to Suffolk County Charter law. The chapter on ENVIRONMENTAL REVIEW AND ENFORCEMENT contained in this report gives a complete update of pine barrens review in Suffolk County.*

**Suffolk County Department of Health Services (SCDHS)**

The Division of Environmental Quality within the SCDHS completed a number of significant water supply and groundwater studies during 1987, the most significant of which was the Comprehensive Water Resources Management Plan, which defines a strategy for ensuring an adequate and safe water supply for Suffolk County residents through the planning period 2020 and beyond. This strategy includes both structural and non-structural measures for protecting Suffolk's groundwater resource from further contamination, for addressing existing groundwater quality problems, and for providing present and future populations with potable water *at the tap*. The plan document contains extensive background information on existing resource conditions, particularly groundwater quantity, quality, and usage. Existing programs for resource protection and utilization are reviewed, as are projections of future needs, and a full range of possible management options.

Plan recommendations cover measures designed to protect the quantity and quality of the resource, and those designed to ensure that potable water is available to all Suffolk residents. Groundwater protection measures are further divided into those involving public education, regulation/enforcement, planning, and technical investigations. Water supply distribution recommendations cover a range of structural and non-structural measures, including the extension of public water mains, treatment of contaminated public wells, and establishment of water quality treatment districts in impacted rural areas (see the *NEW RECOMMENDATIONS* section of this report). Additional water supply studies completed by the SCDHS during 1987 included the following:

- *SODIUM MONITORING IN PUBLIC WATER SYSTEMS (1987): The average sodium concentration detected in most community public water supply distribution systems was less than 20 ppm, which is the recommended limit for individuals on severely-restricted sodium diets. No system exceeded the 270 ppm guideline level recommended for individuals on moderately-restricted sodium diets.*

- *CORROSION MONITORING SURVEY (1987): The county-wide average pH for community public water systems that provide corrosion control treatment was found to be 7.4, compared to 6.2 for untreated systems. Corrosion products (metals) resulting from the breakdown of piping and plumbing fixture materials were examined in household tap samples. Copper was present in 25 percent, but never exceeded the drinking water standard. Low concentrations of lead were found in two systems; none had detectable levels of cadmium.*

- *TRIHALOMETHANE MONITORING IN PUBLIC WATER SYSTEMS (1987): Samples from the distribution systems of community water suppliers were analyzed for trihalomethane compounds (THMs). Only one of the 46 samples from non-chlorinated supplies had detectable THMs (2 ppb). Seven of the 56 samples from chlorinated supplies had detectable THMs ranging from 1 to 14 ppb, with an average of 4 ppb, compared to the drinking water standard of 100 ppb. The study concluded that the benefits of using chlorine as a disinfectant to prevent infectious diseases far outweighs the potential health risks from chlorine-derived THMs.*

Recent Water Resources Investigations (WRI) reports prepared by the USGS as part of the cooperative program with the SCDHS include the following:

- *Hydrologic Appraisal of the Pine Barrens (WRI 84-4271)*
- *Ground-Water Assessment of the Montauk Area (WRI 85-4013)*
- *Ground-Water Movement in the Manorville Area November 1983 (WRI 85-4035)*
- *Geohydrology of the Lloyd Aquifer (WRI 85-4159)*
- *Geohydrology and Ground-Water Quality on Shelter Island (WRI 85-4165)*
- *Organic Compounds in Ground Water Near a Sanitary Landfill in the Town of Brookhaven (WRI 85-4218)*
- *Detection of Contaminant Plumes in Ground Water of Long Island by Electromagnetic Terrain-Conductivity Surveys (WRI 86-4045)*
- *Ground-Water Recharge in Nassau and Suffolk Counties (WRI 86-4181)*

Among the SCDHS studies still in progress or expected to begin in 1987 are the following:

- *AGRICULTURAL CHEMICAL REMOVAL METHODS: Pilot scale studies were conducted on units using three types of treatment methods* – carbon adsorption *(for pesticides),* ion exchange *(for nitrate), and* reverse osmosis *(for both pesticides and nitrate). These tests indicated that all three processes have potential usefulness in residential, commercial, and municipal applications. Work during 1987 included the design of a large-scale anion exchanger for the Greenport Water District, which will be installed during 1988 at a well field with nitrate problems.*
- *BROOKHAVEN WASTEWATER MANAGEMENT STUDY: The project will evaluate existing conditions and determine the best measures for providing sewage collection, treatment, and disposal facilities for development within a 35 square mile area that includes portions of Coram, Farmingville, Medford, Middle Island, Miller Place, Mount Sinai, and Selden. Evaluations of treatment plants within the study area were completed in 1987.*
- *VIRAL CONTAMINATION FROM CESSPOOLS: The occurrence and movement of human enteric viruses in groundwater was assessed in a medium-density residential area of Sayville that is served by on-lot sewage disposal systems. Groundwater 40 feet below the water table was found to be free of enteric virus contamination, but cesspool* spiking *tests indicated that enteric viruses are capable of migrating distances of at least 50-60 feet in the aquifer downgradient of small on-lot systems. Additional spiking tests were conducted during 1987 at a new test facility in Sayville; evaluations will be completed in 1988.*
- *FISHERS ISLAND WATER SUPPLY: Increased seasonal population pressures, and the need to upgrade the island's existing surface water reservoir supply system, resulted in the initiation of an island-wide water resources study. The study will examine the possible use of groundwater as a supplemental water supply.*
- *CONTAMINANT BIOTRANSFORMATIONS: The transformation of nitrate and aldicarb by microorganisms in anaerobic portions of the groundwater system will be examined in this study, which is funded in part by the U.S. Department of Interior. Radiological methods will be employed to date the age of groundwater at a shallow test site and in the regional aquifer system.*

Numerous on-going programs for groundwater and water supply management are administered by the Division of Environmental Quality, including the following:

- *PUBLIC WATER SUPPLY REGULATION: The Suffolk County Water Authority and the Brentwood Water District applied for and received approval to reduce monitoring frequencies for trihalomethanes. All 42 non-chlorinating community supplies were reviewed and were found to comply with State criteria for a chlorination waiver; 15 waivers were formally processed during 1987. The SCDHS began reviewing and commenting on Annual Water Supply Statements, which must be distributed by public water suppliers to their customers before March 31, 1988 (see Chap. 752, L. 1986 amending the Public Health Law by adding new Sections 1151-1153). These reports will provide information relating to water quality, plant capabilities, treatment, and water conservation; as of February 1988, however, formal regulations covering statement content had not yet been promulgated by the NYSDOH.*

- *CROSS-CONNECTION CONTROL: Plans for installations of cross-connection control devices (backflow preventers) such as* Reduced Pressure Zone Devices *(RPZs) and double check valves are reviewed by the SCDHS, which has also been issuing final approvals (instead of the NYSDOH) since April 1985. Because of a SCWA policy adopted in 1984 requiring RPZ devices on all new commercial services, the SCDHS' workload has increased steadily, reaching 370 plan approvals in 1986, and 580 approvals in 1987; future workload increases are anticipated.*

- *PESTICIDE CONTROL: Contractual agreements with Rhone-Poulenc Incorporated (formerly Union Carbide), the manufacturer of Temik (aldicarb), and FMC Corporation, the manufacturer of Furadan (carbofuran) were to expire at the end of 1987, but were extended by the manufacturers for at least three months while negotiations continue. These companies have been paying Suffolk County over $300,000 annually for the monitoring of the two carbamate pesticides. Rhone-Poulenc also asked that the USEPA and NYSDEC amend the label and restrict the use of its organophosphate pesticide Mocap (ethoprop) on Long Island after it was detected in low concentrations in shallow test wells adjacent to a treated potato field. A 1987 agreement was reached with DuPont for a one-time payment of $97,000 to reimburse the County for the cost of monitoring the carbamate pesticide Vydate (oxamyl), which was used on potato farms until 1984. Negotiations between Suffolk County, the New York State Department of Law, and SDS Biotech, however, failed to produce an agreement on the provision of filters and monitoring funds for the firm's herbicide Dacthal, which remains on the market for use on food crop fields, sod, golf courses, and residential turf. A number of private wells located near sod farms have been found to exceed the drinking water guideline of 50 ppb, but have not contained carbamate pesticides, and so have not been eligible for carbon filters from Rhone-Poulenc or FMC Corp.*

- *AGRICULTURAL PUMPAGE MONITORING: Water meters installed on agricultural wells at 6 sites have been monitored since 1986 to measure the volume of water used for various types of agricultural and turf irrigation purposes. Sites include East End farm fields planted in potatoes, corn, mixed crops, and grapes. Wells supplying water for golf course, greenhouse, and nursery irrigation purposes have also been metered. Flow data is being collected by the SCDHS and the Cooperative Extension Association of Suffolk County. These data will aid in evaluating the effects of pumping on pestcide migration in groundwater system.*

- *SUPERFUND INVESTIGATIONS: Aquifer studies were conducted at two Superfund sites in Rocky Point, and one in East Moriches. The Friendship Drive plume in Rocky Point was tracked upgradient (southward) to a site on Route 25A that was formally occupied by a local dry cleaning establishment; the Noah's Path investigation is continuing. The exact origin of contamination at the Pine Street plume in East Moriches could not be identified, but appears to be unrelated to any evident commercial or industrial point source. A follow-up investigation of a North Bay Shore plume containing dry cleaning solvent and vinyl chloride was initiated. The plume is now located within one block of the SCWA's Thomas Avenue well field (which so far has shown no impact); Superfund action has been requested.*

- *FUEL RECOVERY: Fuel recovery systems were installed by the SCDHS at the Firematics Training Center in Yaphank (No.2 fuel oil) and the County Airport in Westhampton (JP-4 jet fuel?). Both systems employ in-well ejectors to remove product, air strippers for water treatment, and recharge basins to recharge treated water and discharge from the water table drawdown wells. Negotiations are underway with the U.S. Air Force to take over operations at Westhampton if the spill proves to be military fuel. The SCDHS also continues to monitor spills at five other County-owned sites as required by the NYSDEC.*

- *MAGOTHY AND LLOYD AQUIFER MONITORING: The deep well monitoring network provides important water level and water quality data for portions of the aquifer system where additional stresses and demands are foreseen. A Magothy well cluster was installed during 1987 at the Yaphank County Center to provide aquifer recharge boundary data within Hydrogeologic Zone III and the defined stream corridor of the Carmans River. A Lloyd well cluster installed near Republic Airport in Babylon indicated a large (30-foot) downward head difference across the Raritan clay unit.*

- *ENVIRONMENTAL DATA MANAGEMENT: A multi-user, distributed mini-computer network was purchased from Prime Computer in 1987. The host facility will be located in Hauppauge, with satellite processors in the Farmingville and Riverhead offices. Real-time access to most environmental data bases will be available once transfer from the existing time-sharing service at Stony Brook University are completed. The new system will also include sophisticated graphics capabilities using the ARC/INFO geographic information system.*

- *LABORATORY SERVICES: The addition of new analytical equipment at the SCDHS' Public and Environmental Health Laboratory is presently on hold pending the completion of the new lab building in Hauppauge, which is tentatively projected for summer 1988. In the meantime, the number of samples that can be processed is decreasing due to expanded quality control requirements, lower detection limit requirements (as low as 0.5 ppb), and an increasing number of compounds (e.g., polynuclear aromatic hydrocarbons such as naphthalene and benzopyrene). A sampling van was added during 1987 to facilitate the safe and proper collection of chemical evidence in the field.*

**STATUS OF 1987 RECOMMENDATIONS**

While most of the recommendations contained in the 1987 Annual Environmental Report were acted upon by Suffolk County during the past year, additional implementation efforts are required for 1988. The Comprehensive Water Resources Management Plan was completed, and a Capital Reserve Fund was created to facilitate the extension of public water mains to communities where groundwater is contaminated. Federal Superfund monies were also utilized to provide water main extensions in over half a dozen communities.

Agreements with carbamate pesticide manufacturers were extended through the year to support private well filter programs and County monitoring efforts, but negotiations for 1988 were not completed, and no agreement was reached with the manufacturer of the herbicide Dacthal. In the meantime, East End towns have been reluctant to utilize water quality treatment districts as a mechanism for providing safe drinking water to impacted rural areas.

Additional staffing was budgeted to handle the increased water supply surveillance workload imposed by new State and Federal drinking water regulations, but most of these positions have not yet been filled. The potential effectiveness of future environmental management efforts was enhanced with the purchase of a sophisticated computer system, but the expansion of water sample analysis capabilities has been hampered by delays in the opening of the new laboratory building in Hauppauge.

**NEW RECOMMENDATIONS**

Implementation of the recommendations contained in the Suffolk County Comprehensive Water Resources Management Plan is urged for 1988. The plan's recommendations are divided into two basic categories -- those designed to ensure that potable water is available to all residents, and those designed to protect the long-term quantity and quality of the resource. The water supply distribution recommendations are further divided into nine program elements:

- *WATER MAIN EXTENSION PROGRAM: Continue and expand the Capital Reserve Fund program, and urge the SCWA and Riverhead Water District to construct regional transmission mains in portions of their service areas, to provide extensions of public water mains to areas where existing groundwater quality threatens public health.*

- *WATER SUPPLY TREATMENT: Provide county financial incentives for construction of public water supply treatment facilities necessitated by new USEPA standards and future groundwater pollution problems.*

- *LIMITATION OF NEW PRIVATE WATER SUPPLIES: Prevent the proliferation of small, marginally operated private water supply systems by requiring all new community and non-community systems to be owned and operated by an existing community water supplier, or by requiring that a special district be formed.*

- *EMERGENCY PUBLIC WATER SUPPLY SERVICES: Establish a county contingency fund to provide water supplies when emergencies occur, such as equipment failures, well contamination, water main breaks, or financial failures of water suppliers.*

- *INTERIM PRIVATE WATER SUPPLY SERVICES: Provide county funding for short-term measures such as bottled water, centralized distribution, temporary mains, and point-of-use devices to supply potable water on an interim basis to residents in contaminated areas that are awaiting the extension of public mains.*

- *RURAL WATER SUPPLY ASSISTANCE: Provide county financial assistance for the purchase of point-of-use treatment units, to be distributed through town water quality districts, to make potable drinking water available in contaminated areas that are not accessible to water main extensions.*

- *MARGINAL WATER COMPANY ACQUISITION AND IMPROVEMENT: Develop a county program to expedite the upgrading or takeover of over two dozen marginal community and non-community water systems by developing estimates of improvement or acquisition costs, and priority ranking and scheduling.*

- *PUBLIC WELL FIELD SITE ACQUISITION: Give municipal and publically-owned water suppliers the right of first refusal on properties forclosed by the county; initiate a county feasibility study of providing the SCWA and other suppliers access to state, county, and municipal parklands and open space to reserve potential sites for future public supply well fields.*

- *WELL ABANDONMENT AND REPLACEMENT: Expand existing county programs for the regulation of replacement private wells to ensure proper design and location, and establish a program for abandoned wells to ensure correct sealing so as to prevent surface contamination from being introduced into the underlying aquifers.*

The groundwater protection measures recommended for implementation by Suffolk County generally involve the expansion of present programs in the areas of public education, regulation and enforcement, planning, and investigations:

**Public Education**

- *PUBLIC INFORMATION PROGRAMS: Expand county public information programs to foster implementation of study recommendations, particularly those related to water conservation, toxic household waste disposal, and non-agricultural fertilizer and pesticide use.*

- *TOXIC HOUSEHOLD WASTE DISPOSAL CONTROL: Provide county incentive funding for local STOP (Stop Throwing Out Pollutants) programs; assist with program coordination and publicity, while allowing the towns to continue to be responsible for program operations.*

- *WATER CONSERVATION: Promote voluntary reductions in water use, particularly use related to lawn irrigation, and mandate leak detection and remediation programs for public suppliers; eliminate decreasing block rates for non-residential and multi-dwelling (master metered) customers.*

- *COUNTY COOPERATIVE PROGRAM: Expand public information programs of the Cooperative Extension and Suffolk County Soil and Water Conservation Service to promote environmentally safe methods of application for agricultural and residential fertilizers and pesticides.*

**Regulation and Enforcement**

- *MONITORING AND SURVEILLANCE: Expand county compliance monitoring and water supply surveillance capabilities to improve enforcement of existing sanitary code and environmental regulations at commercial and industrial facilities, particularly those located in deep recharge or water supply sensitive areas, and to respond to new, more stringent USEPA and NYSDOH drinking water standards and water supply surveillance requirements.*

- *CHEMICAL SPILL RESPONSE AND COMPENSATION: Establish a county contingency fund to expedite emergency cleanups of chemical spills and to provide compensation for third parties damaged as a result of such spills; authorize the the County Attorney to handle litigation to recover costs from responsible parties.*

- *WELL FIELD PROTECTION: Establish a county program to install an early warning network of monitoring wells at public water supply well fields, so that remedial actions, such as aquifer restorations or installations of water treatment equipment, can be expedited.*

- *INDUSTRIAL PROPERTY TRANSFER: Require sellers of industrial and certain commercial properties to file site assessments with the county which demonstrate and certify that the property is clean and has not caused groundwater contamination; require cleanup, if necessary, prior to property transfer.*

***Planning***

- *WASTEWATER COLLECTION: Conduct county feasibility studies of wastewater collection and treatment in heavily developed, unsewered commercial and industrial areas of the deep recharge zone; conduct county or town studies of fast-growing residential areas, and areas previously developed at medium to high densities.*

- *BI-COUNTY WATER DEVELOPMENT: Foster bi-county cooperation in groundwater matters of mutual concern, such as the proposed Nassau pumping centers at Muttontown and Manetto Hills, by establishing a bi-county water development agreement.*

- *FLOW AUGMENTATION NEEDS: Mitigate the impacts of the Southwest Sewer District on freshwater resources by obtaining federal and state grants to identify the streams to be augmented, design remedial actions, and prepare plans and specifications.*

**Investigations**

- *PESTICIDES: Conduct county field studies of groundwater impacts, and annual inventories of pesticide use, to establish the need for controls on additional agricultural pesticides, and chemicals applied by homeowners, utilities, and institutions.*

- *STREAM CORRIDOR RECHARGE: Evaluate the need for additional land use and wastewater controls within the watersheds of major streams by conducting county field studies to better define the relationship between regional groundwater flow and shallow groundwater discharges to the Connetquot, Carmans, and Peconic Rivers.*

- *SALTWATER INTERFACE: Conduct county field studies of saltwater interface responses to pumping stresses (saltwater upconing) and natural processes such as tidal fluctuations and drought conditions to improve regulations on screen placement and pumping rates for shoreline wells.*

**Additional Federal, State, or Local Action**

Recommended actions include continued use of local zoning powers for the protection of deep recharge areas; municipal controls (limitations) on the removal of native vegetation and the percentages of lot areas that may be covered by turf; new federal and/or improved state controls on cesspool and drain cleaners; and, control of pesticides through improved state reporting requirements, liability coverage by manufacturers, and container deposits.

# SURFACE WATERS AND FRESHWATER WETLANDS

## INTRODUCTION

### 1. Existing Conditions

The streams, ponds and wetlands in Suffolk County are a valuable scenic, ecological, recreational and educational resource. Fresh surface waters include streams, rivers, natural lakes, natural ponds, and artificially created ponds. Long Island streams during baseflow conditions are fed by groundwater and represent groundwater level during dry periods. Streamflow is influenced by precipitation, naturally occurring overland runoff, and development-induced stormwater runoff. Intermittent streams are created by overland flow of stormwater during storms. Streams are generally edged with a narrow band of wetlands and can include larger areas of freshwater wetlands. Streams and lakes discharge into the bays and have a significant impact upon estuarine water quality and shellfish and finfish resources.

More consideration should be given to the impact of the pollutants discharged from septic systems and direct stormwater runoff into surface waters. Stormwater runoff and sedimentation from the building area of development sites need to be adequately managed. Site plans should be approved with control measures identified on the plan that control stormwater runoff during and after construction. Properties with a depth to seasonal high water table of two feet or less should be given additional site plan review, before septic system permits or variance approvals are granted. The impact on general wildlife habitat and survival needs should be given more consideration.

### 2. Monitoring

The *United States Geological Survey* (USGS) monitors flow and water quality at gaging stations on 21 streams and rivers on Long Island, 13 of which are located in Suffolk County. Data collected is then incorporated into the National **WAT**er **STO**rage and **RE**trieval System (WATSTORE) which was established to provide an effective means for releasing data to the public.

Monitoring as reported in the USGS *Water Resources Data Report for Long Island, Water Years 1983 through 1986*, revealed that average stream flow levels throughout Suffolk increased during the four year period. Generally, stream flow was above average for the 1983, 1984 and 1985 water years. By the 1986 water year, stream flows had decreased to below average. In 1986, maximum monthly mean discharges at most stations occurred in November and minimum monthly mean discharged occurred in September. Table 9 summarizes water discharge records for 8 selected streams and rivers in Suffolk County from 1983 through 1986.

The USGS Water Resources Data Report for Long Island also contains monitoring data with respect to water quality. Water quality parameters for selected surface waters include: conductivity, pH, temperature, turbidity, dissolved oxygen, coliform, and total hardness, along with dissolved calcium, magnesium, sodium, sulfate, chloride, fluoride, silica, nitrogen, phosphorus, total residues, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, mercury, nickel, silver, zinc, carbon and methylene blue.

**TABLE 9**
**Summary of Water-Discharge Records (Cubic Feet/Second) for 8 Selected Suffolk County Rivers and Streams**

| | | - MEAN DISCHARGE - Water Year | | | |
|---|---|---|---|---|---|
| **Stream or River** | **Average Discharge for Period of Record** | **1983** | **1984** | **1985** | **1986[1]** |
| Nissequogue River at Smithtown, N.Y. | 1943-1986 42.0 | 46.10 | 57.00 | 46.30 | 37.60 |
| Peconic River at Riverhead, N.Y. | 1942-1986 37.0 | 43.10 | 67.90 | 35.80 | 22.70 |
| Carmans River at Yaphank, N.Y. | 1942-1986 24.2 | 27.10 | 36.70 | 29.30 | 19.10 |
| Swan River at East Patchogue, N.Y. | 1946-1986 12.7 | 9.51 | 18.50 | 12.40 | 10.60 |
| Connetquot Brook at Central Islip, N.Y. | 1979-1986 6.6 | 6.23 | 12.30 | 8.08 | 3.10 |
| Connetquot River near Oakdale, N.Y. | 1943-1986 38.5 | 38.30 | 52.50 | 34.80 | 29.00 |
| Sampawams Creek Babylon, N.Y. | 1944-1986 9.7 | 9.91 | 15.40 | 9.62 | 6.79 |
| Carll's River Babylon, N.Y. | 1944-1986 26.6 | 26.20 | 38.00 | 22.20 | 18.10 |

[1] 1987 information is not available

Source: United States Geological Survey - Water Resources Data Reports for Water Years 1981-1986, Syosset, N. Y.

## PRIORITY PROBLEMS

### 1. Stormwater Runoff

Stormwater runoff is the transport mechanism for many contaminants deposited on impermeable or relatively impervious surfaces, and it is often an important contributor to surface water degradation. Although stormwater runoff may contain high concentrations of one or more contaminants, treatment is rarely provided before discharge into surface waters. Mitigation measures, such as a marsh pond, ecological recharge basin or a sedimentation basin, should be used to trap and filter out some of the pollutants before discharge into surface waters. Such measures can reduce fecal coliform bacteria and allow for the filtering out or partial uptake by plants of some heavy metals, inorganics, and nutrients. To compound the problem, many coastal and inland wetlands were filled and developed, further reducing stormwater storage areas and decreasing the natural filtering of contaminants that occurs in wetland areas. Sources of contaminants to fresh surface waters include:

- animal wastes
- highway deicing materials
- fertilizers
- pesticides
- air borne contaminants
- wind or rainfall
- general urban refuse

High concentrations of phosphorous from fertilizers applied to landscaped areas and/or nitrogen from other sources in the immediate watershed area can result in algal blooms and other eutrophic conditions. Raindrops dislodge contaminants and soil particles from land surfaces. This material is carried in solution or suspension and travels with the runoff.

Biological monitoring has been used to measure the impact of stormwater upon aquatic communities. Increased pollution in urban ponds and streams has resulted in marked changes in the type and number of species present. A high coliform bacterial count in runoff is considered an indication that pathogenic organisms may also be present. When confined to stormwater drainage systems, runoff containing pathogenic organisms generally poses little threat to public health since stormwater is not ingested; however, when stormwater enters fresh surface waters where swimming is permitted, it can become a problem. Runoff-related bacterial and viral contamination of waters used for swimming may result in beach closings. Occasionally contact with or ingestion of bacteria and viruses may present a health hazard.

A high concentration of pollutants can cause a significant adverse impact on aquatic life. *Biological Oxygen Demand* (BOD) resulting from contamination can cause the depletion of oxygen in receiving waters which is one of the most important impacts on fresh water systems. When high BOD loadings are discharged to surface waters, the resultant depressed oxygen levels eliminate those species that cannot survive at low oxygen levels.

Grease and oil products are sometimes disposed on the land, into storm sewers or directly into surface waters. If sufficient concentrations of these products are found in the water column or accumulate on aquatic plants, they can harm or kill aquatic biota. Salts from highway deicing practices also can kill or harm aquatic vegetation and impact aquatic ecosystems.

**2. Illegal Dumping**

Occasionally, streams, ponds, wetlands, and adjacent watershed areas have been utilized for the dumping of construction materials, excess fill and general household garbage. Since town residents generally have to pay directly for the removal of solid wastes from their properties, there is the temptation to dump household wastes in and near streams, ponds and wetlands. Some landfill operators are not accepting commercial wastes, causing additional problems.

## GOVERNMENTAL PROGRAMS AND ACTIVITIES

**1. State Programs**

**Wild, Scenic and Recreational Rivers Act (W.S.R.R.A.)**

The *New York State Wild, Scenic and Recreational Rivers Act* (Title 27 of Article 15 of the Environmental Conservation Law) offers a means for protecting selected rivers and their immediate environs. Comprehensive management plans are required to protect surface water and to conserve other significant natural and cultural features within the river corridor. The Part 666 Regulations for Administration and Management of the Wild, Scenic and Recreational Rivers System went into effect on March 26, 1986. Permits from the NYSDEC are required for all development within designated river corridors. Once boundaries have been delineated, regulations regarding development within the river boundary go into effect. No commercial or industrial uses are permitted. Maximum allowable residential densities are; one dwelling unit per two acres within designated recreational segments and, one dwelling unit per four acres within designated scenic segments of each river corridor.

Four major river systems in Suffolk County are included in the program. Boundary and permit procedures are in effect for the Carmans and Connetquot Rivers. The following discussion presents an update on the remaining two rivers.

NISSEQUOGUE RIVER

The Town Board of Smithtown has been working with their consultant and the New York State Department of Environmental Conservation (NYSDEC) in order to finalize the boundaries. In 1987 draft boundaries were submitted to the NYSDEC. Currently the Town is preparing support documentation justifying the proposed boundaries. The moratorium on development within the interim one half mile river corridor was lifted in 1986 when Part 666 regulation went into effect.

PECONIC RIVER

In July 1987 the Peconic River and tributaries from its headwaters west of William Floyd Parkway to the Riverhead dam was added to the Wild, Scenic and Recreational Rivers Program. Previously a study conducted by the Towns of Brookhaven, Riverhead and Southampton was submitted to the NYSDEC. The moratorium imposed during the study was lifted upon the end of the study and inclusion of the river in the program. The interim boundary was set at one half mile from the river. A public hearing on the final boundaries is planned for August 1988. The river has been designated as scenic upstream of the Long Island Railroad bridge, located in Calverton approximately 4000' west of Edwards Avenue, and recreational downstream of that bridge.

For further information on the Wild, Scenic and Recreational Rivers Act, contact:

NYSDEC - Building 40
State University of New York @ Stony Brook
Stony Brook, New York 11790
(516) 751-7900

**New York State Freshwater Wetlands Act**

The New York State Department of Environmental Conservation (NYSDEC) is currently in the process of implementing the *N.Y.S. Freshwater Wetlands Act and Statewide Minimum Land Use Regulations for Freshwater Wetlands* (Article 24 of the ECL). The NYSDEC originally mapped those wetland areas greater than 12.4 acres. The NYSDEC held map hearings for Suffolk County in August and September, 1984. As a result of those hearings the NYSDEC has been requested to consider for designation approximately 1000 additional wetland areas. Those revisions are now complete. Lists of adjoining landowners are being compiled. Public hearings are planned for late 1988. They will be followed by a 30 day comment period. The finalized maps will then be signed by the Commissioner of the NYSDEC and filed with County and Town Clerks putting the regulations into effect.

The administration of the freshwater wetlands regulations may be transferred to the local governments. Most towns in Suffolk County have expressed the desire to assume the administration of the freshwater wetlands program. A permit is required for any construction activity within a designated freshwater wetland or its 100' buffer.

To review the tentative maps or obtain additional information on administration of the N.Y.S. Freshwater Wetlands Act and Statewide Minimum Land Use Regulations for Freshwater Wetlands (Article 24) contact:

NYSDEC - Building 40
State University of New York @ Stony Brook
Stony Brook, New York 11790
(516) 751-7900

**Long Island State Parks Commission**

The Belmont Lake Project began approximately four years ago, when the Long Island Parks Commission, in conjunction with the NYSDEC received monies for restoration of that freshwater lake. In order to return the lake to a more natural condition, existing sediment was mechanically removed from the bottom of all but the northwest quadrant of the lake. The sediment was removed because it was supporting nuisance aquatic plants (*macrophytes*), which also became a nutrient sink, thus contributing to eutrophication of the lake. A hard sand-gravel bottom was restored.

After an interruption of work from April, 1986 to March, 1988 due to problems in controlling turbidity, the revised project was completed in March, 1988.

**2. Bi-County Programs and Activities**

**205J - Special Groundwater Protection Areas Pilot Project**

*The study was completed, published and distributed by the Long Island Regional Planning Board in 1987. A number of surface water control measures are proposed in the study. Revised zoning, open space and cluster development plans were prepared. The zoning plan included a selection of minimal impact zoning categories for undeveloped or partially developed shoreline areas. Performance standards and development guidelines were proposed to protect important aquatic or marine resources from future increases in pollutant loadings. The plan proposed that the Town of Brookhaven should implement its clustering ordinance, require dedication of conservation easements and design development standards to protect surface water resources.*

**3. Suffolk County Programs and Activities**

***Lake Ronkonkoma***

*Lake Ronkonkoma is a prime, centrally located freshwater recreational resource in Suffolk County. Increasing lake pollutant loadings, shoreline erosion and dumping are significant problems that require implementation of a comprehensive management strategy based upon sound scientific data. In recent years, the fecal coliform levels of the lake have periodically exceeded the state standards for public bathing activities. Also, in the late summer, blue-green algae blooms have been observed. Future development near the lake could significantly increase fecal coliform levels and algae blooms.*

*The County's main goals for land acquisition were to protect water quality, to provide an open space system surrounding the lake, to develop several properties for active recreational purposes and to minimize the amount of development that would be situated along the lake. Most of these County-owned lands will be maintained in their natural state and used for passive recreation.*

*The project entitled the Lake Ronkonkoma Clean Lakes Study was published in 1986 and includes chemical and biological monitoring and comprehensive planning for water quality protection. Suffolk County Planning Department, Suffolk County Department of Health Services and the New York State Department of Environmental Conservation were responsible for the primary project tasks. In addition, Suffolk County had obtained federal assistance from the USEPA under the authority of Section 314 of the Clean Waters Act (33 USC 1251 et. seq.).*

*The following recommendations were developed as a result of numerous meetings with other agencies and private citizens,as well as the water quality investigations and a study of conditions surrounding the lake.*

*PROTECT LAKE WATER QUALITY*

- *Reduce the existing bacterial and nutrient loads to the lake by implementing the stormwater control measures identified in the Lake Ronkonkoma Plan.*
- *Prevent any future increases in nutrient, sediment or bacterial loads to the lake.*
- *Prevent future illegal sanitary or other waste disposal into or adjacent to the lake.*
- *Prevent any new intensive land uses (commercial, high density residential, etc.) within the 300 acre immediate watershed area.*
- *Improve the stormwater drainage systems within the immediate lake watershed area.*
- *Prevent any man-made conditions that would increase the flooding problems to the lake.*
- *Prevent any future man-made erosion of the lake shoreline.*

*PROTECT THE WETLANDS*

- *Prevent any future damage to the bog or other freshwater wetlands.*

*ENHANCE THE LAKE RONKONKOMA PARK SYSTEM*

- *Acquire additional properties required to complete the park system.*
- *Improve the scenic quality of the lake area.*

*PROVIDE ADDITIONAL PARK FACILITIES*

- *Improve pedestrian access particularly on the eastern side of the lake.*

Various recommendations to the Clean Lakes Study have been or are currently being implemented. The Suffolk County Department of Public Works completed the construction of a recharge basin on a triangular parcel of land located east of the lake where C.R. 16 is on the north, Lake Shore Road on the west and Old Portion Road on the south. It now receives all stormwater on C.R. 16 from a point 500 feet east of the intersection of C.R. 16 and Old Portion Road. The Suffolk County Department of Public Works has also completed construction of the parking facility for the Suffolk County parkland along the lake shore. Construction of an ecological recharge basin is planned along Steuben Blvd. This project will divert stormwater from entering the marshland north of the lake.The Lake Ronkonkoma Clean Lakes Study is available upon request to the Suffolk County Planning Department.

***Orowoc Creek***

Suffolk County Planning Department, in conjunction with the Town of Islip and the Great South Bay Audobon Society, are in the process of developing a nature preserve area along Orowoc Creek. There are several Town-owned parcels, in addition to existing County-owned properties that should be placed in the Nature Preserve. One parcel is proposed for acquisition under the County's Open Space Preservation Program. Once this area is in the nature preserve, it would then be made available to the Great South Bay Audobon Society to conduct environmental education programs.

**EXTENT OF IMPLEMENTATION OF 1987 RECOMMENDATIONS**

**1. Surface Water Protection Districts**

The municipalities have not designated surface water protection districts, but most surface water areas have been designated as Critical Environmental Areas under the New York State Environmental Quality Review Act (SEQRA and Local Law No. 22-1985). (See *ENVIRONMENTAL REVIEW and ENFORCEMENT*)

## RECOMMENDATIONS

### 1. Prohibit Direct Stormwater Runoff into Surface Waters and Wetlands

*The State, County and the municipalities should prohibit any new direct stormwater runoff discharges into surface waters or wetlands which may result from new development. Stormwater management measures identified in the 208 Nonpoint Source Management Handbook should be implemented when applicable.*

### 2. Provide Cleanup Funds

*The County and municipalities should provide funds for personnel, equipment and disposal of debris discharged on lands adjacent to surface waters or into surface waters and wetlands. In addition, enforcement of local ordinances relating to illegal dumping should be increased. Fines and penalties should be increased commensurate with the resulting environmental damage.*

### 3. Establish Conservation Easements

*The municipalities should require the dedication of Open Space preservation areas and/or conservation easement during the site plan review process in order to protect surface waters and wetlands adjacent to new subdivision development. The easements and dedications should be placed on the final map. Municipalities should field check easements and dedicated lands to determine if they are remaining undisturbed and in their natural vegetation. Stiff fines should be levied against those who have not adhered to the terms of the easement.*

*The Suffolk County Planning Commission and the Suffolk County Pine Barrens Review Commission should also continue to recommend that municipalities utilize the dedication of areas preserved through clustering and the establishment of conservation easements in order to protect surface waters and wetlands.*

### 4. Acquire and Maintain Streambeds

*Acquire and maintain those streambeds and the surrounding watershed areas that have dried up due to sewering. The retention of these areas will facilitate the recharge of runoff, thus reducing the amount of streamflow following a storm and the subsequent associated high coliform loadings that would otherwise reach the bays. These areas could also be used for potential streamflow augmentation with treated wastewater.*

# MARINE ENVIRONMENT AND COASTAL ZONE MANAGEMENT

## INTRODUCTION

The imprint of the New York City region is clearly evident in the degradation of water quality that exists along the shorelines of Long Island. Water quality generally improves as distance increases from areas where tidal flushing action is incapable of rapidly diluting the large volume of pollutants discharged to waterways from sewage treatment plants with combined sewer overflows. Suffolk County is fortunate in that the most serious water quality degradation has occurred to the west of its shores. However, the trends revealed by the research and monitoring conducted under the Long Island Sound Study document a decline in water quality that is increasing in aerial extent from west to east in the Sound, with subsequent impacts on marine species. Action must be taken to deal with the more obvious water quality problems associated with oil spills, and the fouling of beaches with various types of floatable material, including infectious medical waste. However, of even greater significance are the efforts required to deal with the more insidious degradation associated with sewage treatment plant discharges, storm water runoff and the associated inflow of toxic materials, nutrients and pathogenic organisms.

## PROBLEM AREAS AND TRENDS

### 1. Marine Water Quality And Public Health Issues

The presence of coliform bacteria in water has long been used as an indicator of fecal pollution. While coliform themselves are generally harmless to man, their presence is used as a surrogate to indicate that pathogenic bacteria and viruses may also be present. In productive bay ecosystems, excessive contamination by pathogens can render shellfish unfit for consumption. Shellfish tend to concentrate particular contaminants and associated coliforms when filter feeding in polluted waters. The total coliform standard for shellfishing areas is 70 MPN per 100 ml.

As of January 1, 1988, 200,538 acres of marine waters in the greater Long Island region were closed to shellfishing activities. This constitutes approximately 17% of total New York State Marine District waters. There was an increase of 36 acres closed to shellfishing in 1987 within the Great Peconic Bay. A breakdown of shellfish closure acreage by waterbody is provided in Table 10.

Emergency shellfish closures, those closures of limited duration which are required to protect the public health from unforeseen pollution related incidents, occurred in 1987 in Budd's Pond, Port of Egypt, Greenport. This closure was the result of an overflowing septic system. In addition, the winter conditional shellfish opening was postponed in Mattituck Inlet in 1987.

Based on an analysis of water quality samples taken in 1985, 1986, and 1987, the NYSDEC has withdrawn the proposed closure of 5,500 acres in eastern Great South Bay/Bellport Bay/Patchogue Bay to shellfishing activities. NYSDEC, Suffolk County and the Town of Brookhaven executed a bacteriological water sampling program in the bays and tributary streams in this area to examine the problem. During early 1987, the Village of Patchogue's sewage treatment plant was upgraded to provide improved treatment of its discharge into Patchogue River, which subsequently drains into Patchogue Bay. Bacteriological water quality in Patchogue Bay improved substantially following the upgrading and, therefore, precipitated the withdrawal of the NYSDEC's proposed decertification.

Bathing beaches within the County are routinely monitored by the SCDHS prior to and during bathing season. In 1987, 1,589 water samples from 197 bathing beaches within the County were collected for bacterial analysis. Due perhaps to a dry summer, bacteria counts at all beaches were remarkably low in 1987. No bathing beach closures involving either fresh or marine waters were required on the basis of poor water quality. Only the Camp Pa-Qua-Tuck beach on Kalers Pond did not open due to a long history of water quality problems caused in part by a large Canada goose and sea gull population on camp grounds. Plans are underway to construct a swimming pool at this facility.

SCDHS continued its program of special water quality monitoring studies in County waters during 1987.

- The Crescent Duck Processing Plant outfall was sampled on 38 occasions for nutrient, bacteria, chlorine residual and specific conductivity. Nitrogen values in the effluent were found to be extremely high.

- To assist NYSDEC, sanitary surveys of Setauket Harbor, Hashamomuck Pond and Mattituck Creek were done. Shellfish waters in Babylon Town were sampled on three occasions; 66 bacteriological samples were collected.

- In June, a *208-style* sampling was repeated in the Flanders/Peconic Bay system. All stations were sampled twice (once at high and once at low water slack). Shoreline point sources were also sampled by personnel of the Fresh Water Resources Section.

Unfortunately, the bathing beach picture was not as bright during the summer of 1988. Public health concerns over the stranding of a very minute quantity of floatable material, including such objects as used syringes, blood-filled vials, surgical gloves, plastic debris, mattress pads, etc., resulted in the closure of many metropolitan area beaches during the summer of 1988. In Suffolk County, Robert Moses State Park, Smith Point County Park and other Atlantic Ocean beaches were closed, albeit for only a few days. The insidious nature of the material, the sources of which are alleged to be the illicit disposal of *red bag* or infectious medical waste and the combined sewer overflow system in New York City, resulted in the public perception that Suffolk County beaches were unsafe to use. This fear was compounded due to cover stories on area pollution that appeared in the August 1, 1988 issues of Newsweek and Time magazines, and the closure of several other bathing beaches primarily found along north shore harbors, but also the ocean beach at Quogue, during late July and early August due to high coliform concentrations. Though most of the beaches opened shortly after the adverse water quality conditions subsided, a portion of the public continued to hold the perception that the region's beaches were unsafe. This fear was also translated against the consumption of shellfish and fish caught in local waters, and demand for seafood plummeted. Although this reaction was unfounded, the $6 billion/yr. tourism economy in Nassau and Suffolk Counties suffered an extreme blow as vacation plans were eliminated or cut short and beach visitations reduced dramatically. It has been estimated that this loss of visitation alone has cost the regional economy a minimum of $50 million. Local businesses, commercial fishermen, charter boat owners, beach concessionaires, restaurants, hotels/motels and fish markets all suffered in the affair.

The debris strandings and potential public health problems that resulted in bathing beach closure and subsequent adverse economic impacts have underscored the need for regional action to reduce the inadvertent, illicit as well as sanctioned disposal of floatable material and other types of waste in marine waters. If such action is not taken, the public will be faced with the growing threat of sporadic beach closures, inconvenience and economic dislocation in future summers.

**TABLE 10**
**NYS Marine District Waters Closed to Shellfishing as of January 1, 1988**

| Body of Water | Total Acreage | Acreage Closed to Shellfishing |
|---|---|---|
| Hempstead Bay | 11850 | 10770* |
| South Oyster Bay | 6190 | 3005* |
| Great South Bay | 11450 | 3220* |
| Great South Bay | 18980 | 1150* |
| Great South Bay | 16325 | 643* |
| Great South Bay | 11525 | 2118* |
| Bellport Bay | 5595 | 495 |
| Moriches Bay | 10900 | 4430 |
| Quantuck Bay | 730 | 730* |
| Shinnecock Bay | 9170 | 220 |
| Mecox Bay | 1045 | 1045 |
| Napeague Bay | 9135 | 12 |
| Montauk Harbor | 1085 | 205* |
| Acabonack Harbor | 310 | 0 |
| Three Mile Harbor | 1025 | 355* |
| Gardiners Bay | 48950 | 4* |
| Northwest Harbor | 1550 | 0 |
| Shelter Island Sound | 9450 | 209* |
| Sag Harbor | 575 | 208* |
| West Neck Harbor | 625 | 0 |
| Noyack Bay | 3540 | 38* |
| Southold Bay | 1340 | 0 |
| Hashamonmuck Pond | 170 | 170 |
| Orient Harbor | 3560 | 0 |
| Coecles Harbor | 1205 | 0 |
| Little Peconic Bay | 13725 | 0 |
| Cutchogue Harbor | 585 | 2 |
| Great Peconic Bay | 19060 | 55 |
| Flanders Bay | 3090 | 1444 |
| Mattituck Creek | 125 | 125 |
| Wading River | 50 | 50 |
| Mount Sinai Harbor | 455 | 70* |
| Port Jefferson Complex | 1550 | 1279 |
| Western Long Island Sound | 88300 | 26650 |
| Central Long Island Sound | 188000 | 0 |
| Eastern Long Island Sound | 121000 | 300 |
| Stony Brook Harbor | 855 | 16* |
| Nissequogue River | 555 | 555 |
| Smithtown Bay | 22300 | 1000 |
| Huntington Bay | 2420 | 19 |
| Northport Bay | 1825 | 9 |
| Northport Harbor | 410 | 392 |
| Centerport Harbor | 490 | 243 |
| Duck Island Harbor | 185 | 0 |
| Lloyd Harbor | 600 | 19 |
| Huntington Harbor | 340 | 340 |
| Oyster Bay Harbor | 5040 | 727 |
| Cold Spring Harbor | 1325 | 310 |
| Dosoris Pond | 105 | 105 |
| Hempstead Harbor | 3465 | 3465 |
| Fishers Island Sound | 7990 | 910 |
| Stirling Basin | 135 | 135 |
| Pipes Cove | 370 | 0 |
| Napeague Harbor | 885 | 0 |
| Westchester Shore | 15520 | 15520 |
| Manhasset Bay | 2725 | 2725 |
| Raritan Bay | 12410 | 12410 |
| Lower Bay | 31400 | 31400 |
| Upper Bay | 6740 | 6740 |
| Jamaica Bay | 12235 | 12235 |
| Cold Spring Pond | 220 | 0 |
| Sebonac Creeks | 430 | 0 |
| North Sea Harbor | 225 | 18 |
| Wooley Pond | 30 | 10 |
| Atlantic Ocean | 283200 | 26623* |
| Block Island Sound | 125700 | 0 |
| Goldsmith Inlet | 20 | 20* |
| Georgica Pond | 350 | 0 |
| Sagaponack Pond | 160 | 0 |
| Oyster Pond | 70 | 70 |
| Hudson River | 3100 | 3100 |
| East River | 8860 | 8860 |
| Little Neck Bay<br>East Chester Bay<br>Long Island Sound(NYC) | 13560 | 13560 |
| **TOTAL ACREAGE** | **1,188,470** | **200,538*** |

*Includes seasonally uncertified portions

### 2. Algal Blooms

Periodic increases of algal populations in marine waters, called blooms, may result from changes in light intensity, water temperature, nutrient availability, and stimulatory and/or inhibitory substance concentration, however, knowledge concerning precise interactions of the causative agents is incomplete. For three consecutive summers (1985-1987) a plankton bloom of unprecedented proportions has appeared in Suffolk County east end bays (Peconic System) and south shore bays (Shinnecock, Moriches, Great South Bay). This bloom, descriptively known as the *brown tide* because of the color of the water, was caused by a minute (2-3 μm diameter) phytoplankter tentatively identified as *Aureococcus anorexefferens*. The occurrence of the bloom, although to a lesser degree, in Narragansett Bay, Rhode Island and, possibly, Barnegat Bay, New Jersey, suggests the possibility of a regional (perhaps meteorological) rather than a local cause. Still, it is quite likely that euthrophication, while perhaps not the proximal cause of the proliferation of the bloom organism, plays a large role in sustaining the bloom both spatially and temporally.

Eutrophication results from increased population growth and often has a deleterious effect on the very things that make an area desirable. Anthropogenic inputs added to naturally enriched estuarine ecosystems can sometimes overnourish a beneficially productive system transforming it into one of equal (or even higher) productivity, but of less value. The *brown tide*, which occurred in the Peconic System over the last three years, is a prime example of this transformation.

Extensive monitoring of bloom conditions in the Peconic system was undertaken by SCDHS in 1987. Nine stations were sampled on 40 cruises during the period from March through December. Cells of the brown tide organism, first appeared on 4/27 in Flanders Bay (236 cells/ml) and then during May in Great Peconic Bay and Northwest Harbor. After reaching peaks on 5/18 that ranged form 519 cells/ml at eastern Gardiner's Bay to $1.3 \times 10^5$ cells/ml in Flanders Bay, cell counts quickly declined. On 6/2, no cells were detected at three of the eight stations sampled. In marked contrast to this was West Neck Bay (Shelter Island) where the bloom was already fully developed on 6/2 ($7.0 \times 10^5$ cells/ml) and the water distinctly brown in color. A maximum concentration of $8.4 \times 10^5$ cells/ml was found in mid-June, but was followed by a steady decline through July to a value of $2.8 \times 10^4$ cells/ml.

From late June through July, cell numbers increased dramatically, reaching maximum concentrations on 7/22 that ranged from 3.9 to 9.6 x $10^5$ cells/ml. After another increase in mid-August, cell counts at most stations declined and remained fairly constant through September and October, with numbers ranging from 1.2 - 3.2 x $10^5$ cells/ml. During November cell counts decreased to less than 1.0 x $10^5$ cells/ml, but surprisingly rebounded in December, despite the fact that water temperatures had fallen below 5°C. On December 28, cell counts ranged from 9.0 x 103 cells/ml to 2.2 x $10^5$ cells/ml in the system.

In 1987, the SCDHS prepared a proposal entitled *Brown Tide–Comprehensive Assessment and Management Program* that was submitted to the NYSDEC requesting funds under Section 205(j) of the *Federal Quality Water Act of 1987*. The purposes of the project are to determine the cause(s) of the brown tide, and to identify practicable measures that could help restore and preserve the environmental integrity of the affected marine waters of Suffolk County. The overall study area will be the basin that includes the surface waters and surrounding area from the Peconic River on the west extending eastward through Gardiners Bay. This is the area where the multi-million dollar scallop industry has been decimated by the brown tide. The principal focus of this study will be Flanders Bay. Other marine waters in which the brown tide has occurred (Shinnecock Bay, Moriches Bay and eastern Great South Bay) will be examined in general to determine the applicability of management options evaluated in detail for the Peconic System.

The total budget for this effort is estimated to be $820,000 with $200,000 provided from Suffolk County Capital Project 8228, $420,000 of in-kind services from the Suffolk County Dept. of Health Services. NYSDEC awarded $100,000 to Suffolk County in response to its proposal submission in 1988, and has indicated that an additional $100,000 will be forthcoming in 1989, pending receipt of Federal funds under Section 205(j). It is projected that the study will be completed by April 1990.

The SCDHS continued its program of investigating the potential of paralytic shellfish poisoning (PSP) associated with the red tide algal blooms in County waters during 1987. Mussels were placed in Accabonac Harbor, Coecles's Harbor, Flanders Bay, Lake Montauk, Mattituck Creek, Reeves Bay, Sag Harbor Cove and Town Creek (Southold). During the period from February through July, 55 samples for bioassay and 65 phytoplankton samples were collected. PSP toxin was found in mussels collected from Reeves Bay (Flanders) on May 5 (38 micrograms/100 grams) and May 21 (50 micrograms/100 grams); both values are well below the 80 micrograms/100 grams of mussel meat standard utilized for closure of shellfish lands. No toxin was found in any other sample. The brown tide and the extremely hot summer destroyed all mussel stock by August. Due to the priority of the brown tide monitoring program, the red tide program was not resumed for the balance of the year.

### 3. Toxic Spills in Surface Waters

During 1987 Suffolk County experienced many more toxic spills resulting in ground contamination than surface water contamination. There were 42 spills to surface waters reported to NYSDEC during this period. Five of these spills involved volumes greater than 100 gallons. They included a combined total of 1,146 gallons of gasoline, diesel fuel, heating oil, lubricating oil and sodium hypochlorite. It should be noted, however, that the volume of product spilled in 24 of the incidents could not be quantified.

### 4. Floatable Strandings And Fish Kills

No reports were received by the SCDHS in 1987 concerning the occurrence of significant floatable material strandings or fish kills along Suffolk County beaches. See section 1 for discussion on medical waste pollution of area beaches during the summer of 1988.

### 5. Marine Mammal And Sea Turtle Strandings

The Long Island marine environment provides habitat for whales, dolphins, porpoises, seals and sea turtles. Occasionally, dead or moribund individuals of these protected species are beached or discovered in shallow waters. The Okeanos Ocean Research Foundation, Hampton Bays, New York, in conjunction with the NYSDEC, coordinates the New York State Marine Mammal and Sea Turtle Stranding Program. The program is designed to investigate (and where possible, assist) all diseased, injured, distressed and dead marine mammals and sea turtles in New York waters and associated beaches.

The list shown in Table 11 provides the common name and the number of strandings reported in 1987 within Suffolk County.

**TABLE 11**
**Suffolk County Marine Strandings 1987**

| Common Name | 1987 |
|---|---|
| SEA TURTLES | |
| Loggerhead | 13 |
| Atlantic Green | 2 |
| Leatherback | 14 |
| Kemp's Ridley | 31 |
| SEALS | |
| Grey seal | 0 |
| Harbor seal | 3 |
| WHALES, DOLPHINS & PORPOISES | |
| Fin Whale | 1 |
| Humpback Whale | 0 |
| Dense Beaked Whale | 0 |
| Minke Whale | 0 |
| Pygmy Sperm Whale | 1 |
| Pilot Whale | 1 |
| Saddleback Dolphin | 0 |
| White-sided Dolphin | 1 |
| Striped Dolphin | 1 |
| Bottlenose Dolphin | 1 |
| Common Dolphin | 1 |
| Dolphin-species not det. | 1 |
| Harbor Porpoise | 1 |
| | 72 |

The total number of strandings within the Long Island area in 1987 was 106; for Suffolk County alone, there were 72 strandings.

Of all the sea turtles examined, the Kemp's Ridley, *Lepidochelys kempii*, is the most endangered species. Further study is being continued on this species under a 5-year contract with the NYSDEC through the Return A Gift to Wildlife program.

A new location for the Okeanos Foundation is being considered utilizing Suffolk County property at Shinnecock County Park West. The Foundation has organized a building committee to initiate the proposed construction.

Persons with information about stranded marine mammals or sea turtles, either alive or dead, should contact the New York State Marine Mammal and Sea Turtle Stranding Network Hotline at (516) 728-8013.

## MARINE RELATED ACTIVITIES

### 1. Marine Wetlands

Marine wetlands are natural habitats that provide high primary productivity; fish and shellfish nursery grounds; and breeding/feeding grounds for waterfowl and other wildlife, including rare and endangered species. They also perform valuable functions, such as wave/erosion protection; flood control; and pollutant reduction. The long-term trend of marine wetlands destruction so evident during the period from 1950 to the early 1970s, when Suffolk County experienced a growth of 400% of its population, has been effectively curtailed by increased environmental awareness and the regulatory program established under Article 25 of the N.Y.S. Environmental Conservation Law. In 1954, there were 20,590 acres of wetlands, intertidal and high marsh, in Suffolk County; by 1971, only 12,725 acres remained. This represented a 38% loss in 17 years.

Today, loss of wetlands per year is significantly lower than in the past. (One to five acres lost/year is typical.) During 1987, NYSDEC documented the destruction of less than 1 acre of vegetative tidal wetland. The NYSDEC estimates that on average, an additional 2-3 acres/year is lost to illegal development activities.

To date, almost 2,100 acres of wetlands have been acquired in Suffolk County by New York State. The NYSDEC has acquired these wetlands primarily through such programs as the 1972 Environmental Quality Bond Act. To date, of the $18 million budget for the 1972 EQBA, $9 million have been expended, $6 million have been committed (mostly to ongoing projects with the remainder to court of claims exposure costs), and $3 million are targeted for future acquisition. In 1987, 28.4 acres of tidal wetlands at Long Beach Bay, Orient were purchased by the NYSDEC in Suffolk County at a cost of approximately $127,000.

Other recent acquisitions by the State, the County, various towns, and private organizations, such as the Nature Conservancy, that include upland and freshwater wetland areas, as well as tidal wetlands, are listed in the *Open Space* Section.

The NYSDEC has proposed tidal wetland acquisitions utilizing 1972 EQBA monies for 1988 that total approximately 742 acres and include: Northwest Harbor (approx. 70 acres); Accabonac Harbor (approx. 250 acres); and Long Beach Bay, Orient (approx. 422 acres).

The 1986 Environmental Quality Bond Act authorizes the allocation of monies to acquire various environmentally sensitive lands within New York State, including tidal wetlands. A total of $250 million was appropriated with approximately $60 million available for 1987/88. Four hundred acres of tidal wetlands along Shinnecock Bay (north side of barrier beach from Southampton town line east to Shinnecock Indian Reservation), with buffer, have been proposed by NYSDEC for acquisition under this bond act for 1988.

Typically, these acquisitions and those made under Suffolk County's parkland acquisition program have been targeted to relatively large wetland/adjacent shoreline parcels that have been threatened by development. However, ecologically important wetlands in Suffolk County still remain unprotected in private ownership today.

The acquisition of remaining privately owned marine wetlands in Suffolk County should be a high priority at the State, County and town levels. The continued loss of shoreline habitats may dictate the need for a program that would create or rehabilitate wetland habitats in proportion to the amount destroyed as a result of unavoidable shoreline development. Other restrictions and requirements, such as limiting shoreline modifications in selected bays/creeks of high resource value, and wetland buffer zones should be instituted by local government.

Approximately 1,800 tidal wetland permits were issued in 1987 by the NYSDEC for Region I (Nassau-Suffolk).

### 2. Dredging

The Waterways Division of the Suffolk County Dept. of Public Works (DPW) completed the 26 dredging projects listed in Table 12 in 1987. A total of nearly 250,000 cubic yards of spoil were dredged. Nine of the 26 projects were completed by DPW with County-owned dredging equipment. These projects accounted for 35,500 cubic yards, or approximately 14% of the total cubic yards dredged. The remaining projects were completed by private contractors at a total cost to the County of approximately $1,267,000. Nearly two-thirds of the Suffolk County funds used to employ private dredging contractors during 1987 were spent to dredge the inlet of Nissequogue River.

Controversy has existed among various interests over the extent to which dredging activity should be conducted to maintain navigation channels in Stony Brook Harbor. A report entitled *Physical and Geological Processes in Stony Brook Harbor: An Assessment for Critical Evaluation of Management Alternatives*, prepared by the Marine Sciences Research Center, Stony Brook with funding from Suffolk County and the Town of Brookhaven addressed the impacts of different channel dredging options on tidal range and shoaling patterns within the harbor. The principal conclusions are:

- *The harbor system is overwhelmed by a large amount of sediment from several sources (L.I. Sound bluffs, the Youngs Island spoil disposal area and the adjacent shore bottom).*
- *The system is flood tide dominated; more sediment is transported into the system on flood tide than out of the system by ebb tides, making the harbor a sediment trap.*
- *The volume and flow of water within the harbor is insufficient to keep both Porpoise Channel (serving the Town of Smithtown marinas) and the Yacht Club spur (serving Stony Brook) well flushed, and hence, free of shoals.*
- *There apparently is little advantage of dredging the Yacht Club spur to a 12 ft. depth, as opposed to a 6 ft. depth, since under both alternatives, shoaling occurs very rapidly. Deeper dredging (to 12 ft.) does not alter the fundamental characteristics of water flow in the system that lead to shoaling.*
- *Dredging will have to occur frequently to maintain both channels. Spoil from such operations should not be placed within the harbor system itself.*
- *Channel dredging increases the tidal range at the head of the harbor, creating environmental impacts removed from the site of the dredging. The greater the depth of the dredged channel, the larger the change in tidal range, and more significant the impact.*

Since dredging and dredged spoil disposal activities associated with maintenance dredging projects have the potential for causing significant effects on the environment, NYSDEC issued a positive declaration under SEQRA with regard to the renewal of permits for maintenance dredging projects conducted by SCDPW. As a result of this positive declaration in July 1987, NYSDEC required the initiating agency - SCDPW - to prepare a *Generic Environmental Impact Statement* (GEIS) for maintenance dredging projects undertaken by Suffolk County. The S.C. Council on Environmental Quality passed resolution #48-87 in August recommending that a GEIS be prepared on the renewal of proposed maintenance dredging operations conducted by SCDPW and that NYSDEC be appointed SEQRA lead agency with respect to Suffolk County maintenance dredging operations. A resolution (#1319-1987) with similar wording was passed by the S.C. Legislature and signed by the County Executive in December. A scoping outline was developed by NYSDEC in March 1988 for the preparation of the GEIS, but as of that time no funding to proceed with the preparation of the GEIS had been appropriated by either NYSDEC or Suffolk County. NYSDEC plans to temporarily extend permits sought by Suffolk County while the GEIS is under preparation.

**TABLE 12**
**Dredging Projects Conducted by Suffolk County During 1987**

| Project Location | Town | Date Completed | Cubic Yards | Cost |
|---|---|---|---|---|
| 1. Sag Harbor Pt. #1 | Southampton | 1-21-87 | 7,361 | $ 89,852 |
| 2. Moriches Inlet (Emergency Fill) | Brookhaven | 3-27-87 | 20,000 | 57,200 |
| 3. Nissequogue River | Smithtown | 4-11-87 | 96,596 | 794,573 |
| 4. Cedar Beach Harbor Inlet | Southold | 4-28-87 | 1,920 | 5,508 |
| 5. Deep Hole Creek | Southold | 5-4-87 | 7,680 | 26,000 |
| 6. New Suffolk Boat Ramp | Southold | 5-12-87 | 1,500 | -- |
| 7. North Sea Harbor | Southampton | 5-29-87 | 15,840 | 48,100 |
| 8. Miamogue Lagoon | Riverhead | 5-29-87 | 2,750 | -- |
| 9. Little Creek | Southold | 6-1-87 | 4,800 | 12,312 |
| 10. Goldsmith Inlet | Southold | 6-18-87 | 4,800 | 10,044 |
| 11. Hawks Creek | Riverhead | 6-5-87 | 1,250 | -- |
| 12. Brushes Creek | Southold | 6-24-87 | 3,000 | -- |
| 13. Trues Creek | Islip | 6-19-87 | 1,568 | 10,319 |
| 14. Brick Kiln Creek | Islip | 7-10-87 | 10,726 | 51,857 |
| 15. Mud Creek | Southold | 7-21-87 | 6,600 | 23,075 |
| 16. Fresh Pond | Southampton | 7-23-87 | 4,750 | -- |
| 17. Corey Creek | Southold | 7-29-87 | 5,040 | 18,850 |
| 18. Wickham Creek | Southold | 8-7-87 | 2,640 | 7,776 |
| 19. Little Creek | Southold | 8-14-87 | 4,000 | -- |
| 20. Wooley Pond | Southampton | 8-14-87 | 10,320 | 35,075 |
| 21. Cold Spring Pond | Southampton | 8-31-87 | 7,020 | 24,212 |
| 22. Red Creek Pond | Southampton | 9-29-87 | 7,500 | -- |
| 23. Crab Creek | Shelter Island | 11-4-87 | 4,320 | 11,988 |
| 24. Far Pond | Southampton | 11-6-87 | 6,500 | -- |
| 25. Champlin Creek | Islip | 11-23-87 | 5,120 | 40,469 |
| 26. Middle Pond | Southampton | 12-2-87 | 4,250 | -- |
| | | **Total County** | | **35,500** |
| | **Total Contractors** | | **212,351** | **$1,267,210** |
| | **TOTAL** | | **247,851** | |

During 1987 the U. S. Army Corps of Engineers (COE) conducted maintenance dredging in the navigation channel leading to Lake Montauk Harbor and within the L. I. Intracoastal Waterway at various locations from Bellport Bay to Quantuck Bay. Approximately 5,000 cubic yards of material were dredged from Lake Montauk Harbor and placed west of the inlet jetty as beach nourishment. Dredging of the Intracoastal Waterway occurred during the last quarter of 1987 and the first quarter of 1988. Table 13 illustrates the quantity of dredged spoil removed from the Intracoastal Waterway and the location of spoil disposal by bay.

**TABLE 13**
**COE Intracoastal Waterway Dredging Activity**

| Location | Cubic Yards of Spoil Removed | Disposal Site |
|---|---|---|
| Bellport Bay | 105,000 | Shirley Marina (100,000)<br>John Boyle Is. (5,000) |
| Narrow Bay | 50,000 | Beach nourishment at Smith Point County Park |
| Moriches Bay | 90,000 | Beach nourishment at Pikes Beach |
| Quantuck Bay | 9,000 | Beach nourishment at Quantuck Beach |

Dredging of the Intracoastal Waterway within Shinnecock Bay was eliminated from this maintenance operation because no suitable disposal site could be found.

Action was taken on the suit brought by the Town of Huntington, County of Suffolk et al. as plaintiffs against the Dept. of the Army, Corps of Engineers New England Division et al. as defendants that challenged the defendant's decision made in March 1982 designating a new site in western Long Island Sound (WLIS III) for the disposal of dredged spoil. On March 22, 1988 the U.S. District Court ruled in favor of the plaintiffs and issued an injunction enjoining the Corps from dumping dredged material or issuing permits to other parties for dumping dredged spoil at the WLIS III site. Unfortunately, over 667,000 cubic yards of dredged material have been dumped at the WLIS III site since its designation. It is expected that the Corps will either appeal the decision and/or comply with NEPA and other Federal statues pertaining to the dredged spoil disposal site designation process.

### 3. Marine Fisheries

***Landings-***

Suffolk County has been and remains the center of New York's commercial fishing industry. In 1986, 36.8 million pounds of fish and shellfish with an ex-vessel value of $39.2 million were landed here. This harvest amounts to 86% by weight and 87% by value of the total marine fishery products landed in the State in 1986. In the aggregate, the County landings for 1986 were about 4.1 million pounds higher than in 1985; the landed value was about $6.2 million higher. Species with Suffolk County landings valued at over $1 million in 1986 by rank order include hard clam, surf clam, American lobster, Atlantic flounder, tilefish, long-finned squid, big eye tuna, swordfish and scup.

In terms of dollar value, the most important fishery to the County, and hence the State, is the hard clam. In 1986, the 2.24 million pounds of hard clam meats landed in the County had a dockside value of $9.56 million. This harvest was 115,000 pounds more than that of 1985.

Unfortunately, the bay scallop fishery in the Peconic Bay system has all but collapsed as a result of the recurring brown tide blooms during the summers of 1985-1987. In the early 1980s, the dockside value of bay scallops landed from the system was as high as $1.8 million. This fishery was not only important to the State's commercial fishing industry, but it was of national significance as well. In 1982, for example, bay scallop

catches from the Peconic system accounted for 27.6% of the total United States landings of this species. Suitable habitat for the bay scallop is found in the states of Massachusetts, Rhode Island, New York, New Jersey and North Carolina. The extent of the habitat, however, is extremely limited; a major proportion of the suitable habitat along the Atlantic Coast is found in the Peconic system, but this habitat has been disturbed by conditions created by the brown tide.

**Hard Clam Transplant Program**

NYSDEC records indicate approximately 30,500 bushels of hard clams were harvested by private industry from areas closed to shellfishing in western L.I. Sound and adjacent harbors, as well as Great Kills Harbor and Raritan Bay in Staten Island, and relayed to waters certified for shellfishing in Suffolk County. An additional 913 bushels of hard clams were harvested and relayed by either town governments or independent baymen in the towns of Oyster Bay, Riverhead and Southampton.

**Hard Clam Management Plan**

The Suffolk County Department of Planning released its report entitled *Strategies and Recommendations for Revitalizing the Hard Clam Industry in Suffolk County, New York* in June 1987. This report, prepared in part with funding provided by the National Marine Fisheries Service contains 15 hard clam resource management strategies that deal with stock enhancement activity and management information and/or regulatory processes. The strategies were applied to the five hard clam fisheries in Suffolk County, namely the Great South Bay, Huntington Bay, Peconic/Gardiners Bay System, Moriches/Shinnecock Bays and the lesser north shore bays fisheries. Recommendations are included vis-a-vis New York State, Suffolk County and township actions that should be taken with regard to fishery management and environmental protection activities. The 15 strategies are:

HARD CLAM STOCK ENHANCEMENT STRATEGIES

1. *Evaluate and establish spawner sanctuaries free of the constraints of town or private ownership boundaries involving underwater lands.*

2. *Conduct the transplant of hard clams from uncertified waters to:*
   - *protected spawner sanctuaries;*
   - *certified waters in a manner that will protect public health and capitalize on the spawning potential of transplanted clams before they are harvested; and/or*
   - *public or private certified or seasonally uncertified waters for natural purification.*

3. *Conduct seed clam planting programs to enhance recreational fisheries or rehabilitate commercial fisheries in selected/restricted areas utilizing techniques that maximize cost-effectiveness of this approach.*

FISHERY MANAGEMENT INFORMATION AND ENFORCEMENT STRATEGIES

4. *conduct stock assessments throughout the bay designed to provide reliable information on the population dynamics of the resource.*

5. *Design, implement and evaluate a program to control entry into the commercial hard clam fishery.*

6. *Obtain data and information that can be used to estimate catch per unit effort.*

7. *Design, implement and evaluate an objective-oriented program of alternate openings and closings of harvest grounds.*

8. *Evaluate the hydrographic suitability of the bay for the establishment of spawner sanctuaries.*

9. *Identify and protect spawning stocks in selected areas by prohibiting or restricting harvests.*

10. *Conduct a research program to determine if the hard clam resource is significantly limited by natural physical factors and/or predation. If it is, determine whether or not effective control is possible, and if so, where, by what means, and at what costs.*

11. *Evaluate marine waters for the purpose of identifying areas that are suitable for the conduct of public and private hard clam mariculture activities.*

12. *Clarify the ownership and extent of underwater land rights.*

13. *Enhance the enforcement of both marine environmental protection and hard clam management laws by increasing patrol capability and efficiency, and by intensifying the prosecution of major offenders.*

MARINE WATER QUALITY MONITORING AND FISHERY HABITAT PROTECTION STRATEGIES

*14. Enhance monitoring activities to:*

*a. detect trends in the quality and characteristics of marine waters and the levels and sources of pollutants;*

*b. evaluate the impact of improvements in sewage treatment and disposal facilities on certification of shellfish growing area.*

*15. Evaluate coastal construction practices and activities, and mitigate their potential impacts on water quality and living marine resources.*

Space limitations in this forum preclude a detailing of the recommendations that have been made; the reader is referred to the report referenced above for the full discussion. The hard clam plan is based on the premise that there is a need for new initiatives for hard clam management activities. This initiative must capitalize on the resources of New York State, Suffolk County and its 10 townships in order to be most effective. General roles pertaining to these three levels of government in the implementation of the plan strategies and recommendations are indicated in Table 14.

**4. Coastal Aquaculture**

***UDC/Suffolk County Bay Scallop Restoration Project***

During 1987, the *Long Island Green Seal Committee, Inc.*, continued its effort to restore breeding populations of bay scallops within the Peconic/Gardiners system, which has suffered as the result of the recurrence of the brown tide algal bloom during consecutive summers from 1985 - 1987. This project is being funded by the *New York State Urban Development Corporation* (UDC) and Suffolk County.

The establishment of three spawner sanctuaries sites at Northwest Harbor, Orient Harbor and Flanders Bay in 1986 met with mixed results. The seed scallops planted at the Orient Harbor and Flanders Bay sites suffered mortality due to siltation, or were removed from the sites as a result of environmental factors. Success was achieved, however, at the Northwest Harbor sanctuary site; losses of seed through the 1986-87 winter were small. Spawning of these scallops was documented to have occurred during July 1987. This spawning was coincident with high cell counts of the brown tide organism. Spat collectors deployed by the Committee failed to provide evidence of successful bay scallop setting in the Peconic Bay system.

**Table 14**

**Potential Jurisdictional Roles in Implementing of Hard Clam Management Strategies and Recommendations**

| Hard Clam Plan Strategies | New York State | Suffolk County | Township |
|---|---|---|---|
| STOCK ENHANCEMENT | | | |
| 1. spawner sanctuaries | x | x | Babylon, Islip, Brookhaven (major) |
| 2. transplants | x(major) | | All towns |
| 3. seed clam planting | x | x | All towns (major) |
| MANAGEMENT INFORMATION & ENFORCEMENT | | | |
| 4. stock assessments | x | x | All towns (major) |
| 5. control of entry | | | Babylon, Islip, Brookhaven, Huntington |
| 6. catch per unit effort | x | | All towns |
| 7. alternate openings/closing of harvest grounds | x | x | Babylon, Islip, Brookhaven, Huntington (major) |
| 8. suitability of bays for spawner sanctuaries | x | x(major) | Huntington, Brookhaven, Smithtown, Southold, Shelter Island, Southampton, East Hampton, Riverhead |
| 9. protection of spawning stocks | | | All towns |
| 10. limitations imposed by natural physical factors and/or predation | x | x | All towns |
| 11. public and private mariculture activities | x | x | All towns |
| 12. ownership rights to underwater lands | | x | All towns |
| 13. enforcement | x(major) | x | All towns |
| WATER QUALITY & FISHERY HABITAT PROTECTION | | | |
| 14. marine water quality & sewage treatment plant monitoring | x | x(major) | All towns |
| 15. mitigation of coastal construction impacts on water quality and biota | x | x | All towns |

The Long Island Green Seal Committee, Inc. elected to modify its 1988 approach given the re-occurrence of brown tide bloom in 1987. A total of over 580,000 20 mm seed scallops were free planted on new sites in Orient Harbor and Northwest Harbor in the fall of 1987. However, within a short time, surveillance of the sites indicated that all seed scallops were lost as a result of predation by spider crabs and conchs.

As a fallback to free planting, the Committee elected to place over 100,000 seed scallops in 100 grow-out cages deployed at two locations in Flanders Bay. It was envisioned that should environmental problems occur, the cages could be picked up and deployed at other locations in 1988. It was observed that growth of the scallops in the cages was minimal during the fall months of 1987 (perhaps this was related to brown tide occurrence); and determined that starfish predation could be controlled by periodic monitoring and predator removal. In December 1987, the scallops in the cages were observed to be alive. The bay iced over soon thereafter, and the cages were not monitored again until March 1988, at which time all of the scallops within cages were dead. It was hypothesized that this winter kill, which frequently impacts wild shellfish populations, could have occurred as a result of the stress imposed on the scallops by the brown tide in the fall.

***Off-Bottom Culture Shellfish/Marine Area Assignment Program***

Temporary marine area use assignments are issued by the NYSDEC in conjunction with its permit program for off-bottom culture of shellfish. The issuance of such assignments reflects acknowledgement by NYSDEC that specified circular areas with a radius of 250 feet (4.5 acres) are being used for off-bottom shellfish culture activities. Assignments must be renewed annually in conjunction with renewal of off-bottom shellfish permits; NYSDEC can request that structures be removed from assigned areas if conflicts arise. In 1988 there were 3 active assignments in place in Long Island waters. Two of the assignments were located in the Peconic Bay system and were issued for oyster or hard clam seed grow-out and hard clam transplant activities. One assignment was in place at a site near Fishers Island for the culture of hard clams and bay scallops. As of March 1988, NYSDEC had received an application for one additional assignment at Fishers Island for activities that would involve the grow-out of oysters utilizing bag culture techniques.

***Underwater Land Rights in Peconic/Gardiners Bays***

Significant uncertainty exists as to the public or private ownership of oyster cultivation rights in Peconic/Gardiners Bays. The *Oyster Lands* map prepared by the Suffolk County Real Property Tax Service Agency in 1983 illustrates the ownership pattern of oyster cultivation rights on the underwater land in Peconic/Gardiners Bays from the mouth of the Peconic River east to a line running from the most easterly point of Plum Island to Goff Point at the entrance of Napeague Harbor. Approximately 550 irregularly shaped parcels with a total area of nearly 110,000 acres are shown on the map. Sixteen of the parcels totalling 2,299 acres are indicated as having unknown owners. The largest private holder of oyster lot cultivation rights in Peconic/Gardiners Bays - L.I. Oyster Farms - is listed as owning 80 parcels totalling 5,684 acres. LIOF is also listed as having dual ownership (primarily with Suffolk County) of 10,214 acres involving 130 other parcels. Dual ownership is indicated on the map when two conveyances cover the same parcel of underwater land. This dual ownership condition exists due to historically poor conveyancing practices, particularly where the underwater land was of marginal value. The LIOF oyster lot rights in Peconic/Gardiners Bays have recently been advertised for sale.

**5. Sewage Sludge Dumping In The New York Bight**

Sewage sludge dumping at the 12-mile dump site in the New York Bight Apex has been terminated. In April 1985, the U.S. Environmental Protection Agency designated the 106-mile ocean waste dump site for the disposal of sewage sludge for a period of five years. During this time, EPA will analyze the impacts of disposal at the site, and an assessment will be made of alternative sludge disposal options. This information will be used by EPA to weigh the need to continue ocean dumping. (New York City has continued the practice of dumping sewage sludge at the 106-mile site. Sludge from Suffolk County is **not** disposed via ocean dumping).

**6. Accabonac Harbor**

In October 1987 the Suffolk County Planning Dept. presented its report entitled *A Planning Analysis of the Accabonac Watershed* to the Town of East Hampton pursuant to its request. This report was conducted by the Dept. under its planning assistance program to Suffolk County municipalities.

Part I of this report includes an analysis of the Accabonac Harbor Watershed in terms of its natural and cultural resources, existing limits on development, land use, marine water quality, groundwater, demographic profile and land available for development. Part II contains findings based on the analysis of Part I. Issues and concerns regarding this area were identified under seven broad categories. They included: habitat and environmental resource protection, marine water quality, multiple use conflicts, groundwater resources, dredging and coastal stabilization, mosquito control activities, and development control.

The report included recommendations relating to the issues and concerns mentioned as well as sea level rise, stormwater runoff, resource management, zoning changes, and aesthetic improvements. Specifically, preservation within the Critical Environmental Area surrounding the harbor of tidal and freshwater wetlands, as well as parcels immediately adjacent to the harbor, was given top priority. Recommendations for protection of certain properties were discussed vis-a-vis public acquisition, easement or clustering alternatives for approximately 750 acres within the study area.

It was recommended that the harbor should remain a small boat harbor with limited facilities for the launching and mooring of boats. Designated breeding bird areas should be protected from human disturbances for the least tern and piping plover (endangered species), at the terminus at Gerard Drive and other spit areas identified within the Accabonac Harbor Study Area. It was also recommended that the Town of East Hampton request that the Suffolk County Bureau of Vector Control consider establishing an *Open Marsh Water Management* (OMWM) system for the wetlands of Accabonac Harbor to control mosquito breeding and reduce insecticide use. Furthermore, it was advised that the Town supply information to homeowners within the Critical Environmental Area regarding the importance of proper maintenance practices of on-site sanitary systems and the adverse impacts associated within excessive lawn fertilization.

**7. Coastal Erosion**

***Westhampton Beach-***

The 1987 Annual Environmental Report contained a detailed description of the proposed coastal erosion project and funding formula agreed to in a settlement between Westhampton Beach summer residents and the Suffolk County Legislature. Implementation of the project, however, has been stalled as a result of the NYSDOS finding that the proposed project is not consistent with the NYS Coastal Management Program. Subsequent to this finding, NYSDOS has considered alternatives to the COE coastal erosion project and has proposed to the COE, as of July 1988, a much less expensive plan to help rebuild the severely eroded section of Dune Road. Under the NYSDOS proposal, several of the western-most groins would be rebuilt in a tapered fashion and sand would be mined offshore to serve as beach nourishment. In light of this latest controversy, the Suffolk County Executive has not yet signed the settlement agreed to earlier by the Legislature.

***Shinnecock Inlet-***

The environmental impact statement and general design memorandum for the Shinnecock Inlet Navigation Project, which calls for the reconstruction of the two inlet jetties and dredging of the inlet navigation channel, were completed in 1987, but are still under review by the COE. Detailed plans and specifications for the project should be prepared in 1988 and, if the funding is in place, work on the project could begin in 1989.

In an attempt to make Shinnecock Inlet safe for navigation until the federal project begins, the County has committed $700,000 from its capital budget for an emergency dredging project of the inlet. The County has received permits from both NYS and the COE for the dredging of a channel through the mouth of the inlet.

***Moriches Inlet-***

Construction of the Moriches Inlet Navigation Project began in 1987 with the reconstruction of the east jetty. Reconstruction of the west jetty will begin in May 1988. The COE anticipates that dredging of the inlet navigation channel will start in 1989.

***Fire Island Inlet-***

The stabilization of Fire Island Inlet and subsequent dredging projects associated with navigation channel improvement have had dramatic impacts on the configuration of adjacent beaches. Historically, the removal of approximately 700,000 cubic yards per year of sand by the COE under its Fire Island Inlet maintenance project resulted in the bypassing of sand to the literal zone west of the inlet. Gilgo Beach and other area downdrift benefited from this operation. The occurrence of shoreline erosion adjacent to the inlet at Oak Beach and homeowner concerns resulted in modification of dredging practice, and a series of interim emergency dredging projects were conducted. The COE had to evaluate the impacts of inlet dredging on salinity levels in Great South Bay and the wave climate at Oak Beach. Studies were underway in 1987 to determine navigation project specifications. Some experts believe that if sand bypassing is not carried out as it was in the 1970s, there will be a continuing erosion problem at downdrift beaches from the inlet.

**GOVERNMENT PROGRAMS AND ACTIVITIES**

**1. Federal Programs**

***201 Waste Treatment Facility Plans-***

*HUNTINGTON-NORTHPORT*: Construction of a scavenger waste pre-treatment plant, and expansion and upgrading of the treatment plant in Huntington, have been completed. The repair of the collection system in Northport has been completed. Work continues on the repair of pump facilities.

*GREENPORT-SOUTHOLD/SHELTER ISLAND*: The recently completed scavenger waste pre-treatment plant has experienced operating difficulties and as a result, the plant has not consistently met the effluent limits listed in its operating permit.

*PORT JEFFERSON*: Construction is now underway on a new secondary treatment plant at SUNY Stony Brook; in addition, the treatment plant in the Village of Port Jefferson is being upgraded to provide secondary treatment. Force mains and pump stations are also under construction. It is anticipated that the Port Jefferson plant will be completed by 1 July 1988, and the plant at SUNY Stony Brook will be completed by February 1989.

*VILLAGE of PATCHOGUE*: Construction of the secondary treatment plant has been completed and the plant is now operational.

*FISHERS ISLAND*: Construction of the community septic tank system is now complete.

*SOUTHWEST SEWER DISTRICT #3*: In 1987, Suffolk County agreed to pay a $250,000 penalty to NYSDEC for failing to meet effluent limits set forth in its discharge permit for the Southwest Sewer District facility. The $250,000 was placed in a special fund to be used within Suffolk County for pollution abatement purposes or water conservation purposes.

Suffolk County has installed three new belt filter presses to dewater sludge. Prior to their installation, the sludge was not being dewatered properly and solids stayed in the system and were subsequently discharged to the ocean. The quality of Southwest Sewer District effluent is now in compliance with the discharge permit. However, Suffolk County is still experiencing operating problems with its sludge incinerator. When the incinerator is not operating, approximately 200 cubic yards of sludge per day are disposed in the Brookhaven Town landfill. When operating properly, 50 cubic yards of ash per day are disposed in this landfill.

Suffolk County has engaged the services of a consultant to assist in plant operation.

*EAST HAMPTON*: Construction of the scavenger waste treatment facility has been completed.

*SUBDIVISION TREATMENT PLANTS*: The following treatment plants are not meeting their permit effluent limits for nitrogen removal and will probably be required to be upgraded:

1. S.D. #2 - Holbrook
2. S.D. #4 - Birchwood
3. S.D. #5 - Huntington Strathmore
4. S.D. #7W - Woodside
5. S.D. #8 - Ridge
6. S.D. #11 - Selden
7. S.D. #15 - Nob Hill

***Flow Augmentation Needs Study-***

In a report entitled *Impact Assessment on Shellfish Resources of Great South Bay, Oyster Bay and Hempstead Bay, New York* dated August 1985, the U.S. Environmental Protection Agency concluded that sewering in western Suffolk County will result in increases in Great South Bay salinity, which in turn will cause an increase in predation on hard clams resulting in an estimated 8% overall decrease in clam standing stock in the study area. This was considered by EPA as a significant adverse impact. The United States Environmental Protection Agency has directed Suffolk County to begin engineering and environmental studies that will result in a plan to augment the following streams, thus conserving stream habitats and maintaining freshwater flows to the bay:

Amityville Creek
Woods Creek
Great Neck Creek
Neguntatogue Creek
Santapogue Creek
Carlls River
Sampawams Creek
Willetts Creek
Lawrence Creek
Penataquit Creek
Orowoc Creek West Creek
Champlin Creek

It is anticipated that the necessary studies will be completed in late 1989 or early 1990.

***Atlantic Outer Continental Shelf Oil/Gas Leasing Activities-***

Even though the threat of potential oil spills from Atlantic outer continental shelf oil production and related transport activities has not become a reality, both New York State and Suffolk County maintain the position that no tracts should be leased north of 40° 15'N. latitude, or within 50 miles of the coastline. In addition, Suffolk County supports the elimination of lease sales west of 60° 15' W longitude. The County will continue to review Minerals Management Service leasing activities as they develop to assure protection resources. North Atlantic Lease Sale #96 and Middle Atlantic Lease Sale #121 have been tentatively scheduled to be held in February and July 1989, respectively.

***Coastal Barrier Resources Act (CBRA) Update-***

A description of the Act and how it impacts Long Island is contained in previous Annual Environmental Reports (1982-1987). Maps showing 58 proposed additions to the existing Long Island coastal barrier resource system units are still under administrative review by the Dept. of Interior. The final report, as required by Section 10 of CBRA, has not yet been submitted to Congress.

***Long Island Sound Study-***

The Long Island Sound Study is sponsored by the U. S. Environmental Protection Agency; federal funding committed to this project since 1985 has totaled approximately $4 million (1985-1987); it is anticipated that federal funding at a level of $1 million per year will be committed to the project during the period from 1988-1991, in addition to 25% matching funds from the States of New York and Connecticut. A plan to preserve and protect the water quality and living resources of the Sound is scheduled for completion by 1991.

The primary goals of the study are to produce management plans for:

*a. relieving the problem of hypoxia (low dissolved oxygen) in the waters of western Long Island Sound;*

*b. controlling toxic contamination of water and bottom sediment;*

*c. conserving the fish and shellfish resources of the Sound.*

Preliminary findings and current activities of the study are:

HYPOXIA

- *The study found that in the summer, bottom water in the western half of the Sound have very low levels of dissolved oxygen.*
- *In areas of lowest dissolved oxygen, fewer fish and shellfish were found relative to more well-oxygenated areas.*
- *Studies of historical data suggest that hypoxia is more extensive now than in the past.*
- *It is suspected that nutrients from sewage treatment plants and runoff are contributing to hypoxia in Long Island Sound.*
- *To determine the causes of hypoxia and what can be done to solve the problem, the study is developing computerized water quality and hydrodynamic models of Long Island Sound. Data for these models will be collected in 1988.*

TOXIC CONTAMINANTS

- *Sources of toxic materials to the Sound have been identified and inventoried.*
- *The study has measured the extent to which water, sediments, and fish and shellfish in the Sound are contaminated with toxic materials.*
- *By comparing recent data to historical studies, the study has determined that some contaminants appear to be declining in the Sound. For example, metal levels in oysters appear to be lower now than they were a decade ago. Other contaminants, however, have not declined.*

FISH AND SHELLFISH

- *The distribution and abundance of fish and shellfish in the Sound are being measured. These data will be used to determine which resources are improving and which are declining relative to the past.*
- *The study is investigating whether toxic materials and low dissolved oxygen are harming fish and shellfish in the Sound.*

**2. State Programs**

***NYS Coastal Management Program (CMP)***

Preparation of a *Local Waterfront Revitalization Program* (LWRP) involves completion of numerous tasks including the compiling and analyzing of information about the local waterfront area, plus review of the plan elements and environmental impact statement by the N.Y.S. Department of State. The following is a list of the major tasks; Table 15 depicts the status of each Long Island municipality as of December 31, 1987.

1. Undertaking an Inventory and Analysis
2. Preparing the Waterfront Revitalization Program Policies
3. Reviewing the Waterfront Revitalization Area Boundary
4. Identifying Uses and Projects
5. Identifying Techniques for Local Implementation of the Program
6. Consulting with Other Affected Federal, State, Regional and Local Agencies
7. Identifying State and Federal Actions and Programs Likely to Affect Implementation of the Local Program
8. Obtaining Local Commitment
9. Preparing the Draft Environmental Impact Statement

The following Suffolk County communities received a total of $115,000 in grants from NYS CMP for non-construction or construction/acquisition projects:

| | | |
|---|---|---|
| Village of Head of the Harbor and Village of Nissequogue | $ 7,500 | Harbor Management & Water Quality Monitoring Program |
| Village of Patchogue | $10,000 | Street End Improvement Plans |
| Village of Sag Harbor | $50,000 | West Water Street Improvements |
| Village of Greemport | $20,000 | Construction of Commercial Dock |
| Village of Greenport | $27,500 | Waterfront Park |

**Table 15**
**Status of LWRPs on Long Island**

| Grants($) | Long Island | Tasks 1-5 Submitted | DOS Comments Sent | Tasks 1-9 Submitted | DOS Comments Sent | Advanced Copy Draft LWRP Submitted | DOS OK'S Advanced Copy | Draft LWRP Submitted | 60-Day Review Started | 60-Day Review Ended | Final LWRP Submitted | SOS Approves LWRP | Notification Issued |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12,000 | Atlantic Beach (V) | | | | | | | | | | | | |
| 12,500 | Babylon (T) | X | X | X | X | X | X | X | X | | | | |
| 10,000 | Bayville (V) | | | | | | | | | | | | |
| 65,000 | Brookhaven (T) | | | | | | | | | | | | |
| 25,000 | East Hampton (T) | | | | | | | | | | | | |
| 20,000 | Freeport (V) | X | X | | | | | | | | | | |
| 7,000 | Glen Cove (C) | X | X | X | X | X | X | X | X | X | | | |
| 10,500 | Greenport (V) | X | X | X | X | X | X | X | X | X | | | |
| 7,500 | Head of the Harbor (V) & Nissequogue (V) | X | X | X | X | X | X | X | X | X | | | |
| 20,000 | Hempstead (T) | | | | | | | | | | | | |
| 30,000 | Huntington (T) Asharoken (V) Huntington Bay (V) Lloyd Harbor (V) Northport (V) | | | | | | | | | | | | |
| 20,000 | Islip (T) | X | X | | | | | | | | | | |
| 25,000 | Long Beach (C) | X | X | X | X | X | X | X | X | X | | | |
| 6,000 | Manorhaven (V) | | | | | | | | | | | | |
| 21,000 | North Hempstead (T) | X | X | | | | | | | | | | |
| 25,000 | Oyster Bay (T) | | | | | | | | | | | | |
| 12,000 | Patchogue (V) | X | X | | | | | | | | | | |
| 10,000 | Port Jefferson (V) | X | X | | | | | | | | | | |
| 7,000 | Riverhead (T) | X | X | | | | | | | | | | |
| 17,000 | Sag Harbor (V) | X | X | X | X | X | X | X | X | X | X | X | X |
| 21,000 | Smithtown (T) | X | X | X | X | X | X | | | | | | |
| 40,000 | Southampton (T) | X | X | | | | | | | | | | |
| 30,000 | Southold (T) | | | | | | | | | | | | |
| 15,000 | Westhampton Beach (V) | | | | | | | | | | | | |

***Coastal Erosion Hazard Areas Act***

A description of the NYS Coastal Erosion Hazard Areas Act is contained in the 1987 Annual Environmental Report. Although final maps for all Nassau and Suffolk communities were completed by NYSDEC in 1986, the Commissioner of NYSDEC has not yet signed-off on the final maps and the maps have not yet been filed with town and village clerks. It is anticipated that final maps will begin to be filed in May 1988 starting with Southampton and East Hampton Towns.

**EXTENT OF IMPLEMENTATION OF 1987 RECOMMENDATIONS**

1. No funding has been secured for the preparation of a storm damage mitigation plan for the Long Island Sound and Peconic/Gardiners Bay shoreline areas.

2. Congress has not modified the National Flood Insurance Program so as to eliminate the availability of flood insurance on new development located in high hazard coastal erosion areas not designated as undeveloped coastal barriers.

3. A wetland creation demonstration project utilizing spoil at a south shore bay location in Suffolk County has not been implemented.

4. A sampling vessel that will allow all-weather sampling in large bays and coastal waters, as well as in enclosed embayments, has been ordered by the SCDHS and is expected to be available in August 1988.

5. Red tide studies were continued in 1987 and, as in 1986, PSP toxin was found in mussels collected from Reeves Bay (an arm of Flanders Bays) during May.

6. The Peconic Bay system was monitored for brown tide on a weekly basis during 1987. However, due to insufficient personnel, monitoring could not be expanded into south shore bays. A number of research programs into the cause and effects of the brown tide were continued in 1987 and some new programs were initiated.

7. A program including strategies and recommendations for improving the management of Suffolk County's five hard clam fisheries was prepared by the Dept. of Planning and distributed to the public in June 1987.

8. No progress has been made with respect to survey requirements in connection with shellfish rights granted to Suffolk County under L#1969, ch 990.

9. The Suffolk County Dept. of Health Services, Bureau of Vector Control has continued to test and evaluate the use of Open Marsh Water Management (OMWM) techniques for mosquito control, but has not yet hired a wetlands biologist to design and implement an OMWM program for suitable tidal wetland sites in Suffolk County.

**RECOMMENDATIONS**

- *Control stormwater runoff to minimize the transport of sediments, nutrients, metals, organic chemicals and bacteria to surface waters. The state, county and municipalities should take action to assure that there are no additional stormwater runoff discharges into surface waters or wetlands as a result of new development or re-development of urbanized areas. Where possible, direct inputs of runoff into surface waters should be eliminated through the installation of storm drain systems that discharge into new or existing recharge basins, retention ponds or alternative structures.*

- *Coastal modifications, such as construction of bulkheads, marinas, berms and other man-made structures reduce the amount of natural shoreline and associated vegetation along a given bay and destroy habitats that support fish and wildlife populations of recreational and commercial value. The land use changes and population growth that cause this transformation also have a negative impact on marine water quality. More emphasis is needed on understanding the cumulative effects of incremental development on bay ecosystem function, and the formulation of policies and regulatory responses that will protect bay environments and the fisheries they support. Assessments should be prepared on the impacts that projected shoreline development will have on local bay water quality, coastal ecosystems and fish and wildlife resources. Policies and regulatory responses that protect local bay environments and resources can then be developed and/or improved within the constraints imposed by regional water quality consideration.*

- *Suffolk County should continue to actively participate on committees associated with EPA-sponsored Long Island Sound Study and assist in the development of the management program for this estuary of national significance.*

- *The State, Suffolk County and local governments should continue to work toward the goal of establishing effective management programs for the hard clam resources in Great South Bay and other local waters.*

- *Due to the anticipated shortage of dredged spoil disposal sites, there is a long-term need to implement a wetland creation demonstration project utilizing dredged spoil at a south shore bay location in Suffolk County.*

- *The SCDHS, Bureau of Vector Control, should design and implement an open marsh water management program for mosquito control in suitable tidal wetland sites throughout the County.*

- *Suffolk County should secure the shellfish rights granted to it under # 1969, ch 990.*

- *According to the Suffolk County Real Property Tax Service Agency, Long Island Oyster Farms is listed as having dual ownership of oyster lot cultivation rights (primarily with Suffolk County) of 10,214 acres in Peconic/Gardiners Bays. Suffolk County should resolve the dual title issue on those parcels where LIOF has an interest prior to any possible disposition by LIOF.*

# ATMOSPHERIC CONDITIONS

## INTRODUCTION

Suffolk County's climate is moderate due to its coastal location. During the summer months, onshore breezes originating from tropical air masses dominate and temperatures are mild, ranging from approximately 60° to 75° F. Continental arctic air masses dominate for about one and a half months during the winter bringing with them colder temperatures, generally in the 20° to 30° F. range. The spring and the fall on Long Island are times of climatic transition between winter and summer. In the spring the sharp frontal boundary between the arctic and tropical air masses lessens. As tropical air masses begin to dominate in the spring and early summer, they bring thunder storms to the Long Island region. During the fall, increased cooling lessens the circulation between the land and the ocean allowing for the reemergence of cold arctic air currents during the winter months.

## PRECIPITATION

The annual average precipitation for Suffolk County is approximately 45" per year, which is more than most locations at comparable latitudes elsewhere in the United States. This is probably due in part to Long Island's close proximity to the ocean. Table 16 shows the average monthly long term precipitation rates in Suffolk County for January through December, as given in the National Oceanographic and Atmospheric Administration's (NOAA) New York Climatological Data Reports for a 50 year period. Table 17 shows the annual precipitation totals at the eight sites from 1979 through 1987. Generally the yearly average annual precipitation rates in 1979 and 1983 were considerably higher than the Suffolk County long term average of 44.5", while 1980, 1981, 1984, 1985,1986 and 1987 were evidenced by significantly lower precipitation rates. During 1987 precipitation rates decreased and were below the long term average.

Table 18 shows the average monthly total precipitation in inches for eight County during 1981 through 1987. As is evidenced from the table, precipitation rates can vary significantly throughout the county depending on the site's location (north, south, east or west) and the time of year. Such variations are indicative of the various microclimatic regions present in Suffolk.

In 1987 the average annual precipitation for the eight sites throughout the county amounted to 39.85 inches which is a decrease from the previous two years. This decrease, however, was still below the long term average of 44.5" per year. (Also see *"Trends"* in the *GROUNDWATER* chapter of this report).

Snowfall within Suffolk County generally occurs between the months of November through April, with the largest accumulations in January, February and March. The annual average snowfall for the county is 29.7 inches. Table 19 shows the long term average monthly snowfall in inches, while Table 20 shows the actual monthly snowfall during the seasons of 1980-1981, 1981-1982, 1982-1983, 1983-1984, 1984-1985, 1985-1986 and 1986-1987 for six sites in Suffolk County. As can be seen from the table, snowfall in the county during 1986-1987 was higher than the long term average. The amount of snowfall in various regions of the county can vary significantly depending upon location and microclimate. The majority of the snowfall for the 1986-1987 season fell during the months of January and February.

## TEMPERATURE

Suffolk County is characterized as having mild winters and cool summers. This is a direct result of the moderating influence of large water bodies on the coastal climate. The warmest month of the year is July with an average temperature of 71°F and the coldest month is January with an average temperature of 31°F. Table 21 shows the average monthly temperatures in the area over a 50 year period as stated in NOAA's Climatological Data Reports. Table 22 shows the average monthly temperatures at six Suffolk County from 1981 to 1987.

Temperature plays an important role in many aspects of land suitability. In Suffolk County there is a long growing season of 200 to 210 frost free days. This aspect, together with adequate precipitation and good soils allowed for the development of a large agricultural industry throughout Suffolk.

**TABLE 16**
**Suffolk County Average Monthly Precipitation in Inches**

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Long Term | 4.20 | 3.59 | 4.61 | 3.62 | 3.49 | 2.89 | 2.92 | 4.46 | 3.66 | 3.55 | 4.61 | 4.10 |

**TABLE 17**
**Annual Precipitation Totals (in Inches)**
**for Eight Sites in Suffolk County, New York**
**1979-1987**

| Site | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|---|---|---|---|
| Belmont Lake | 52.37 | 35.69 | 40.29 | 38.14 | 52.83 | 51.62 | 31.53 | 38.81 | 34.28 |
| Vanderbilt Museum | -- | 42.98 | 38.95 | 38.22 | 59.66 | -- | -- | 43.98 | 36.10 * |
| Patchogue | -- | 38.68 | 41.61 | 47.26 | 66.18 | 62.80 | 40.15 | 46.79 | 40.85 |
| Medford | 50.59 | 27.84 | 30.68 | 35.80 | 52.83 | 50.70 | 32.68 | 33.36 | 35.91 |
| Setauket | 53.71 | 41.93 | 37.92 | 43.80 | 52.49 * | 54.34 * | 37.02 | 42.02 | 40.17 |
| Riverhead | 51.67 | 31.98 | 38.17 | 46.19 | 62.82 | 53.92 | 36.50 * | 43.77 | 41.20 |
| Bridgehampton | 51.42 | 33.83 | 39.69 | 46.69 | 64.05 | 46.06 | 38.85 | 45.42 | 50.10 |
| Greenport | 50.22 | 35.31 | 40.99 | 48.72 | 64.92 | 50.62 | 39.30 | 47.71 * | 40.15 |
| Average | 51.66 | 36.03 | 38.54 | 43.10 | 59.47 | 33.92 | 36.50 | 42.73 | 39.85 |

Note: Suffolk County annual average approximately 44.5 inches.
-- = Data Not Recorded or Available.
* = Monthly Data Missing.

**TABLE 18**
**Monthly Total Precipatation (in inches)**
**for Eight Sites in Suffolk County, New York 1981 - 1987**

| Site | Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Belmont Lake | 1981 | 0.77 | 4.93 | 1.03 | 3.48 | 1.77 | 3.70 | 4.50 | 1.51 | 8.09 | 4.16 | 1.72 | 4.63 |
| | 1982 | 5.16 | 2.63 | 2.36 | 5.53 | 2.20 | 8.35 | 2.20 | 1.75 | 1.36 | 0.95 | 3.41 | 2.24 |
| | 1983 | 2.80 | 2.12 | 6.62 | 10.14 | 3.89 | 2.04 | 2.63 | 3.90 | 2.66 | 5.43 | 4.69 | 5.91 |
| | 1984 | 1.62 | 4.23 | 6.46 | 5.09 | 7.46 | 5.55 | 7.99 | 2.60 | 3.27 | 1.58 | 2.58 | 3.19 |
| | 1985 | .78 | 2.63 | 2.11 | 1.62 | 3.81 | 5.14 | 3.31 | 2.36 | 2.69 | 0.93 | 5.23 | 0.92 |
| | 1986 | 2.66 | 3.15 | 2.70 | 3.04 | 0.30 | 1.77 | 5.82 | 3.75 | 1.63 | 1.99 | 4.97 | 7.03 |
| | 1987 | 2.09 | 0.63 | 4.97 | 4.74 | 1.63 | 2.79 | 3.29 | 2.89 | 4.05 | 1.70 | 2.86 | 2.66 |
| Vanderbilt Museum | 1981 | 0.66 | 5.82 | 1.12 | 3.75 | 2.70 | 2.56 | 4.61 | 1.08 | 5.94 | 4.23 | 1.78 | 4.70 |
| | 1982 | 5.72 | 2.58 | 2.39 | 4.88 | 1.98 | 7.55 | 2.24 | 3.01 | 1.12 | 1.20 | 3.63 | 1.92 |
| | 1983 | 4.12 | 3.25 | 7.53 | 11.77 | 4.64 | 2.24 | 2.66 | 2.44 | 2.14 | 6.01 | 6.46 | 6.40 |
| | 1984 | 1.97 | 4.50 | -- | -- | -- | -- | 8.51 | 0.90 | 3.13 | 2.17 | -- | -- |
| | 1985 | .72 | 2.28 | 1.95 | 1.09 | 5.18 | 4.49 | 4.10 | 1.74 | 2.91 | 1.57 | -- | 1.00 |
| | 1986 | 3.43 | 3.48 | 2.41 | 2.30 | 0.57 | 2.63 | 8.35 | 4.28 | 1.31 | 1.88 | 7.27 | 6.07 |
| | 1987 | 4.56 | 1.01 | 5.19 | 5.21 | 1.93 | 2.26 | 2.60 | 5.09 | 5.11 | -- | -- | 3.14 |
| Patchogue | 1981 | 1.30 | 4.84 | 2.20 | 4.45 | 1.93 | 5.48 | 2.62 | 0.60 | 5.07 | 4.69 | 2.83 | 5.60 |
| | 1982 | 6.48 | 3.29 | 3.32 | 5.75 | 2.22 | 11.34 | 2.32 | 3.20 | 1.29 | 1.72 | 3.72 | 2.61 |
| | 1983 | 3.84 | 4.11 | 8.24 | 12.48 | 5.16 | 3.13 | 3.42 | 4.98 | 1.74 | 4.87 | 8.39 | 5.82 |
| | 1984 | 3.39 | 6.17 | 6.61 | 5.07 | 9.14 | 7.63 | 10.70 | 0.58 | 4.12 | 3.40 | 2.60 | 3.39 |
| | 1985 | 1.58 | 2.79 | 2.64 | 1.90 | 5.23 | 7.04 | 2.40 | 4.46 | 1.09 | 1.95 | 7.95 | 1.12 |
| | 1986 | 4.38 | 4.13 | 3.42 | 3.05 | 1.38 | 1.84 | 4.23 | 5.80 | 2.14 | 2.56 | 6.66 | 7.20 |
| | 1987 | 7.17 | 1.53 | 4.11 | 4.92 | 2.12 | 2.84 | 1.67 | 4.40 | 3.91 | 1.93 | 2.84 | 3.41 |
| Medford | 1981 | 0.50 | 3.85 | 1.15 | 3.80 | 1.25 | 3.80 | 2.05 | 0.50 | 3.75 | 3.70 | 2.43 | 3.90 |
| | 1982 | 5.15 | 2.65 | 2.28 | 3.92 | 1.40 | 8.25 | 1.80 | 2.90 | 0.65 | 1.80 | 3.10 | 1.90 |
| | 1983 | 3.15 | 3.15 | 6.63 | 9.98 | 3.85 | 2.40 | 2.92 | 4.00 | 1.35 | 3.85 | 7.25 | 4.30 |
| | 1984 | 2.80 | 5.75 | 5.30 | 4.85 | 7.00 | 6.50 | 7.00 | 0.45 | 3.80 | 3.05 | 1.75 | 2.45 |
| | 1985 | 2.50 | 2.29 | 2.03 | 2.03 | 4.20 | 5.27 | 1.85 | 4.34 | 1.39 | 1.35 | 5.53 | 1.18 |
| | 1986 | 3.09 | 1.90 | 2.37 | 1.95 | 0.50 | 1.17 | 3.35 | 4.22 | 1.50 | 2.20 | 5.86 | 6.25 |
| | 1987 | 5.75 | 0.95 | 4.68 | 4.07 | 1.51 | 2.18 | 1.63 | 3.75 | 3.70 | 1.83 | 2.90 | 2.96 |
| Setauket | 1981 | 1.62 | 5.17 | 1.03 | 3.95 | 1.92 | 2.80 | 2.71 | 1.27 | 6.18 | 4.49 | 2.17 | 4.61 |
| | 1982 | 6.33 | 2.72 | 3.00 | 4.80 | 2.07 | 10.37 | 2.63 | 2.77 | 1.53 | 1.32 | 3.95 | 2.31 |
| | 1983 | 3.85 | 3.09 | 8.09 | 12.55 | 4.42 | 1.94 | 2.37 | 3.62 | -- | -- | 6.63 | 5.93 |
| | 1984 | 2.05 | 4.76 | 7.38 | 5.09 | 8.59 | 5.14 | 9.34 | 0.55 | 2.87 | 2.71 | 3.34 | 2.52 |
| | 1985 | 1.08 | 2.44 | 1.79 | 2.09 | 4.68 | 6.36 | 2.73 | 4.40 | 1.99 | 1.34 | 6.79 | 1.33 |
| | 1986 | 3.39 | 3.72 | 2.73 | 2.56 | 0.29 | 3.08 | 6.24 | 5.36 | 1.02 | 2.18 | 5.80 | 5.65 |
| | 1987 | 5.16 | 0.53 | 4.35 | 4.99 | 1.71 | 3.03 | 2.31 | 4.82 | 4.90 | 2.01 | 2.84 | 3.52 |
| Riverhead | 1981 | 0.80 | 5.73 | 0.90 | 4.52 | 3.12 | 4.44 | 2.12 | 0.66 | 4.71 | 4.09 | 2.80 | 4.33 |
| | 1982 | 5.91 | 3.01 | 2.71 | 5.48 | 2.95 | 11.63 | 1.74 | 2.83 | 1.94 | 2.11 | 3.82 | 2.06 |
| | 1983 | 4.86 | 4.22 | 7.92 | 10.51 | 4.40 | 2.13 | 2.14 | 5.37 | 1.34 | 4.59 | 4.26 | 6.08 |
| | 1984 | 2.31 | 6.84 | 5.21 | 5.28 | 8.27 | 7.21 | 7.63 | 0.41 | 2.87 | 3.29 | 2.24 | 2.86 |
| | 1985 | 1.21 | 2.11 | 1.96 | 1.83 | 5.15 | 6.14 | 2.39 | 5.93 | 1.35 | 1.25 | 6.22 | 0.96 |
| | 1986 | 4.19 | 3.11 | 3.78 | 1.88 | 0.91 | 3.41 | 4.07 | 4.87 | 1.08 | 2.45 | 6.61 | 7.41 |
| | 1987 | 5.92 | 1.00 | 5.05 | 6.07 | 1.92 | 0.92 | 1.86 | 4.76 | 4.34 | 2.77 | 3.74 | 3.03 |
| Bridgehampton | 1981 | 0.85 | 6.18 | 1.47 | 4.54 | 3.49 | 5.49 | 2.48 | 1.88 | 3.16 | 3.53 | 2.79 | 3.83 |
| | 1982 | 5.25 | 2.47 | 3.02 | 3.77 | 3.36 | 14.58 | 2.13 | 1.54 | 2.12 | 1.81 | 4.01 | 2.63 |
| | 1983 | 4.80 | 5.60 | 7.30 | 9.69 | 4.40 | 3.60 | 2.04 | 1.92 | 2.13 | 6.14 | 11.24 | 5.19 |
| | 1984 | 2.70 | 5.94 | 5.81 | 5.06 | 5.91 | 5.31 | 5.28 | 0.65 | 1.71 | 3.12 | 1.89 | 2.68 |
| | 1985 | 1.15 | 2.40 | 2.25 | 2.04 | 5.58 | 6.06 | 1.10 | 5.43 | 2.64 | 1.97 | 7.20 | 1.03 |
| | 1986 | 4.57 | 3.24 | 2.50 | 1.80 | 0.72 | 3.14 | 5.37 | 3.83 | 1.03 | 3.33 | 7.45 | 8.44 |
| | 1987 | 7.73 | 2.26 | 6.24 | 6.62 | 2.27 | 0.58 | 2.47 | 5.80 | 7.11 | 1.84 | 4.07 | 3.11 |
| Greenport | 1981 | 0.80 | 6.42 | 1.07 | 4.88 | 3.34 | 4.05 | 2.74 | 1.52 | 3.40 | 4.46 | 2.84 | 5.47 |
| | 1982 | 5.02 | 3.94 | 2.96 | 4.50 | 2.67 | 15.98 | 1.54 | 2.05 | 2.98 | 2.12 | 3.16 | 1.80 |
| | 1983 | 5.26 | 4.76 | 6.93 | 10.19 | 4.09 | 2.88 | 2.04 | 5.30 | 1.07 | 7.12 | 10.02 | 5.26 |
| | 1984 | 2.19 | 7.05 | 5.52 | 4.17 | 5.53 | 6.13 | 8.86 | 0.45 | 2.79 | 3.09 | 2.24 | 2.60 |
| | 1985 | 1.27 | 2.68 | 2.35 | 1.48 | 5.62 | 4.85 | 1.68 | 6.06 | 2.70 | 1.66 | 7.65 | 1.30 |
| | 1986 | 4.73 | 2.96 | 3.22 | 1.56 | -- | 4.00 | 4.83 | 8.62 | 0.89 | 3.75 | 6.43 | 6.72 |
| | 1987 | 5.51 | 0.91 | 4.13 | 7.96 | 1.94 | 0.72 | 0.96 | 5.10 | 4.54 | 3.07 | 1.94 | 3.37 |

-- Data not recorded or available.

**TABLE 19**
**Average Snowfall in Suffolk County**

| | Jan. | Feb. | Mar. | Apr. | Nov. | Dec. | Annual |
|---|---|---|---|---|---|---|---|
| Long Term | 8.1 | 7.7 | 7.5 | 0.3 | 0.4 | 5.7 | 29.7in. |

**TABLE 20**
**Monthly Total Snowfall (in inches)**
**for Six Sites in Suffolk County, New York**
**1980 - 1987**

| Site | Season | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | Total |
|---|---|---|---|---|---|---|---|---|
| Vanderbilt Museum | 1980-81 | | 2.0 | 7.0 | -- | 5.0 | | 14.0 |
| | 1981-82 | | 8.7 | -- | -- | 6.0 | | 14.7* |
| | 1982-83 | | 9.0 | 3.0 | 19.0 | | -- | 26.0* |
| | 1983-84 | | .5 | 12.5 | -- | -- | -- | 13.0* |
| | 1984-85 | -- | -- | 12.2 | -- | .8 | | 13.0* |
| | 1985-86 | -- | 1.5 | -- | -- | | | 1.5* |
| | 1986-87 | -- | 1.0 | -- | -- | -- | | 1.0* |
| Patchogue | 1980-81 | | 1.0 | 13.5 | -- | 8.5 | | 23.0 |
| | 1981-82 | 3.0 | 19.5 | .4 | .5 | 10.5 | | 33.9 |
| | 1982-83 | | 7.2 | 1.5 | 22.0 | T | 1.5 | 32.2 |
| | 1983-84 | T | 4.5 | 17.8 | T | 16.0 | | 38.3 |
| | 1984-85 | T | 6.5 | 14.5 | 9.5 | .5 | | 31.0 |
| | 1985-86 | .5 | 4.0 | 2.0 | 16.8 | .3 | T | 23.6 |
| | 1986-87 | 1.0 | 6.0 | 19.0 | 13.0 | 1.5 | | 40.5 |
| Setauket | 1980-81 | | 1.3 | 7.4 | -- | 4.5 | | 13.2 |
| | 1981-82 | -- | 15.7 | .5 | .7 | 6.0 | | 22.9* |
| | 1982-83 | | 3.0 | 1.0 | 14.5 | | | 18.5 |
| | 1983-84 | | .3 | 8.7 | | 6.5 | | 15.5 |
| | 1984-85 | T | 2.0 | 10.8 | 6.8 | .8 | | 20.4 |
| | 1985-86 | -- | -- | 1.3 | 12.5 | T | | 13.8* |
| | 1986-87 | | .8 | -- | 1.5* | .5 | | 2.8* |
| Riverhead | 1980-81 | 0.5 | 1.5 | 18.3 | -- | 6.0 | | 26.3 |
| | 1981-82 | 1.5 | 16.3 | 1.5 | .8 | 6.2 | | 26.3 |
| | 1982-83 | | 6.0 | -- | 20.0 | | | 26.0* |
| | 1983-84 | | 3.0 | 11.8 | T | 10.6 | | 25.4 |
| | 1984-85 | | 2.0 | 17.3 | 10.5 | .5 | | 30.3 |
| | 1985-86 | 1.0 | 5.5 | 1.0 | 15.5 | T | | 23.0 |
| | 1986-87 | T | 4.0 | 17.5 | 6.5 | 1.0 | | 29.0* |
| Bridgehampton | 1980-81 | T | 1.5 | 10.1 | -- | 8.5 | | 20.1 |
| | 1981-82 | .6 | 12.0 | 1.5 | .8 | 6.5 | | 21.4 |
| | 1982-83 | | 6.0 | -- | -- | -- | -- | 6.0* |
| | 1983-84 | | 3.5 | 10.0 | | 9.5 | | 23.0 |
| | 1984-85 | | .5 | 7.0 | 6.5 | .5 | | 14.5 |
| | 1985-86 | 1.0 | 2.6 | T | 14.0 | T | T | 17.6 |
| | 1986-87 | .5 | 6.0 | 20.5 | 9.0 | .5 | T | 36.5 |
| Greenport | 1980-81 | | -- | 9.0 | -- | -- | | 9.0 |
| | 1981-82 | | 23.1 | -- | -- | 7.5 | | 30.6* |
| | 1982-83 | | -- | -- | -- | T | | |
| | 1983-84 | | 3.8 | 6.8 | | -- | | 10.6* |
| | 1984-85 | | T | -- | 10.1 | T | .5 | 10.6* |
| | 1985-86 | -- | 3.3 | -- | 11.5 | | T | 14.8* |
| | 1986-87 | | -- | 12.0 | -- | T | | 12.0* |

T = Trace Amount
-- = Data Not Recorded
* = Based on Partial Data

**TABLE 21**
**Average Monthly Temperature °F in Suffolk County**

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Long Term | 30.9 | 31.2 | 37.2 | 46.8 | 55.5 | 65.1 | 71.1 | 70.4 | 64.2 | 55.1 | 44.2 | 34.1 |

**TABLE 22**
**Average Monthly Temperatures °F**
**at Six Sites in Suffolk County, New York**
**1981 - 1987**

| Site | Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vanderbilt Museum | 1981 | 25.0 | 37.4 | 39.7 | 52.8 | 62.0 | 70.9 | 76.3 | 73.6 | 65.3 | 54.1 | 46.1 | 34.7 |
| | 1982 | 25.1 | 33.5 | 32.3 | 49.2 | 62.3 | 66.1 | 75.2 | 71.6 | 66.7 | 56.9 | 48.3 | 41.4 |
| | 1983 | 34.3 | 33.5 | 41.6 | 50.0 | 58.0 | 71.0 | 76.6 | 75.1 | 70.2 | 56.6 | 47.2 | 34.8 |
| | 1984 | 28.9 | -- | -- | -- | -- | -- | 72.1 | 74.0 | 64.2 | 58.8 | -- | -- |
| | 1985 | 27.0 | 32.5 | 41.3 | 50.8 | 61.7 | 65.3 | 72.9 | 72.2 | 68.4 | 57.7 | -- | 33.2 |
| | 1986 | 31.8 | 29.7 | 40.8 | -- | 63.7 | 69.1 | 74.0 | 72.3 | 65.7 | 56.6 | 44.8 | 38.5 |
| | 1987 | 32.1 | 31.0 | 42.9 | 51.2 | 61.6 | 71.4 | 76.1 | 72.3 | 66.7 | -- | -- | 38.0 |
| Patchogue | 1981 | 22.8 | 35.7 | 38.6 | 50.1 | 58.9 | 68.9 | 75.4 | 71.2 | 64.1 | 51.7 | 45.1 | 33.7 |
| | 1982 | 24.3 | 33.7 | 28.4 | 46.5 | 59.9 | 64.6 | 73.3 | 71.0 | 64.9 | 54.9 | 48.0 | 40.4 |
| | 1983 | 33.3 | 34.0 | 41.5 | 49.0 | 56.1 | 69.1 | 75.0 | 73.8 | 68.4 | 55.3 | 46.5 | 34.2 |
| | 1984 | 27.6 | 38.5 | 35.0 | 48.6 | 57.4 | 69.8 | 72.3 | 74.2 | 62.8 | 57.6 | 45.4 | 41.0 |
| | 1985 | 27.0 | 33.3 | 43.1 | 51.1 | 59.6 | 65.5 | 73.4 | 72.5 | 66.9 | 56.3 | 47.8 | 32.8 |
| | 1986 | 32.6 | 30.5 | 41.2 | 50.7 | 62.1 | 68.7 | 74.1 | 71.5 | 64.5 | 55.5 | 43.7 | 37.2 |
| | 1987 | 31.1 | 31.4 | 42.6 | 51.1 | 59.2 | 70.6 | 75.4 | 71.0 | 65.8 | 52.1 | 46.6 | 37.3 |
| Setauket | 1981 | 24.4 | 36.4 | 39.6 | 52.3 | 60.3 | 69.6 | 75.2 | 73.0 | 64.7 | 52.7 | 45.8 | 34.2 |
| | 1982 | 24.3 | 33.1 | 29.1 | 47.9 | 60.4 | 64.6 | 73.5 | 70.9 | 65.1 | 56.3 | 48.7 | 41.6 |
| | 1983 | 33.8 | 33.8 | 41.0 | 49.7 | 56.9 | 68.7 | 74.7 | 73.6 | -- | -- | 46.5 | 35.2 |
| | 1984 | 29.0 | 38.8 | 35.6 | 48.6 | 58.6 | 70.7 | 72.3 | 74.2 | 63.7 | 58.6 | 47.0 | 41.8 |
| | 1985 | 28.1 | 34.1 | 43.4 | 52.0 | 62.0 | 66.0 | 73.3 | 72.3 | 67.4 | 57.4 | 49.2 | 33.9 |
| | 1986 | 33.3 | 29.7 | 41.6 | 50.6 | 62.5 | 68.7 | 73.7 | 70.8 | 65.1 | 56.8 | 45.1 | 38.1 |
| | 1987 | 32.0 | 32.1 | 42.2 | 50.6 | 61.1 | 69.8 | 74.1 | 70.2 | 65.2 | 53.2 | 48.1 | 38.2 |
| Riverhead | 1981 | 23.7 | 36.5 | 38.5 | 50.6 | 60.1 | 70.3 | 75.9 | 71.7 | 64.6 | 52.9 | 45.7 | 34.1 |
| | 1982 | 24.8 | 32.9 | 30.3 | 47.0 | 61.0 | 64.7 | 73.5 | 69.9 | 64.6 | 55.5 | 49.2 | 41.9 |
| | 1983 | 39.2 | 34.7 | 42.0 | 49.7 | 58.0 | 70.2 | 75.1 | 73.8 | 69.6 | 56.2 | 46.8 | 34.6 |
| | 1984 | 28.5 | 38.4 | 35.1 | 48.7 | 59.4 | 71.8 | 73.1 | 74.5 | 62.6 | 56.6 | 44.6 | 40.2 |
| | 1985 | 27.5 | 33.2 | 42.6 | 51.5 | 61.2 | 66.0 | 73.2 | 72.0 | 66.4 | 56.4 | 48.6 | 32.6 |
| | 1986 | 32.8 | 30.5 | 41.4 | 50.4 | 62.5 | 69.6 | 74.0 | 71.3 | 65.9 | 57.2 | 44.8 | 38.2 |
| | 1987 | 32.2 | 31.5 | 42.6 | 51.2 | 60.8 | 71.4 | 76.5 | 71.5 | 66.4 | 54.2 | 47.6 | 38.3 |
| Bridgehampton | 1981 | 22.8 | 35.6 | 36.9 | 48.4 | 57.5 | 66.7 | 72.9 | 69.5 | 63.0 | 51.3 | 43.9 | 33.7 |
| | 1982 | 23.8 | 32.4 | 37.3 | 44.0 | 57.6 | 61.8 | 71.2 | 67.3 | 62.3 | 53.0 | 47.0 | 39.3 |
| | 1983 | 32.9 | 34.2 | 40.2 | -- | 54.2 | 66.2 | 72.3 | 71.0 | 67.3 | 53.9 | 45.5 | 33.3 |
| | 1984 | 28.4 | 38.0 | 34.2 | 46.6 | 56.0 | 68.3 | 70.7 | 73.0 | 61.9 | 56.1 | 44.4 | 40.5 |
| | 1985 | 25.9 | 32.5 | 41.1 | 48.7 | 57.0 | 63.7 | 72.1 | 70.8 | 64.9 | 55.3 | 48.0 | 32.4 |
| | 1986 | 32.1 | 29.8 | 39.2 | 48.2 | 58.7 | 66.2 | 70.7 | 68.6 | 62.1 | 53.6 | 43.2 | 37.3 |
| | 1987 | 30.5 | 29.4 | 40.4 | 48.2 | 56.6 | 67.7 | 72.0 | 68.3 | 63.6 | 50.3 | 44.7 | 36.3 |
| Greenport | 1981 | 24.7 | 35.3 | 36.9 | 49.9 | 59.0 | 67.8 | 74.2 | 71.4 | 64.5 | 54.3 | 46.0 | 35.6 |
| | 1982 | 23.6 | 32.2 | 37.3 | 44.5 | 58.2 | 62.7 | 73.1 | 70.6 | 61.2 | 55.1 | 49.9 | 40.8 |
| | 1983 | 33.0 | 32.8 | 41.5 | 47.9 | 56.3 | 68.0 | 73.6 | 72.6 | 70.0 | 56.1 | 48.1 | 35.2 |
| | 1984 | 28.0 | 37.1 | 34.2 | 46.5 | 57.6 | 68.9 | 71.8 | 73.4 | 63.9 | 58.3 | 48.3 | 41.3 |
| | 1985 | 27.4 | 32.2 | 40.0 | 49.2 | 59.6 | 64.4 | 72.7 | 72.1 | 66.3 | 57.4 | 48.9 | 34.1 |
| | 1986 | 31.7 | 30.2 | 39.0 | 49.2 | -- | 66.4 | 71.5 | 71.1 | 63.6 | 55.5 | 43.9 | 38.0 |
| | 1987 | 30.7 | 29.7 | 40.2 | 48.5 | 56.7 | 67.7 | 73.4 | 69.9 | 65.0 | 53.1 | 44.5 | 37.4 |

-- Data not Recorded

Temperature is also important in terms of heating and cooling requirements for homes and industry. Temperature data can be analyzed in terms of heating degree days. In a qualitative way, heating degree days reflect fuel consumption. Based on the fact that most buildings require no heat to maintain an inside temperature of at least 70°F when daily average outside temperatures are 65°F or higher, no heating degree days are recorded if the daily average temperature is equal to or above 65°F. If the average daily outside temperature is less than 65°F, then the degree day total is figured as the difference between the base temperature (65°) and the actual average temperature for the day. The higher the number of degree days, the more fuel is required to heat a building during the winter season. Table 23 shows the monthly heating degree days at six specific site locations throughout Suffolk County for the heating seasons of 1980-1981, 1981-1982, 1982-1983, 1983-1984, 1984-1985, 1985-1986 and 1986-1987. Compared to the norms for each site, it can be seen that the 1982-1983, 1983-1984, 1984-1985 and 1985-1986 winter seasons were warmer than usual, while the 1980-1981 and 1981-1982 seasons were colder than normal. Data for the 1986-1987 heating season shows that it was again significantly warmer than normal, thus indicating lower fuel usage for heating purposes throughout the county as a whole.

In similar fashion, cooling degree days indicate the need for air conditioning in order to bring building temperatures down to comfortable levels during the warmer months. The higher the number of cooling degree days, the more electricity that is required to cool buildings during the season. Table 24 shows the monthly cooling degree days at six specific site locations throughout Suffolk County for the years 1982 through 1987. The summers of 1980, 1981, 1984 and 1986 were significantly warmer than usual. 1982, however, appears to have been mixed, with three sites cooler than normal and three sites warmer than normal. 1987 again was significantly warmer than usual and on several occasions energy requirements due to air conditioning demand exceeded LILCO generating capacity.

**WINDS**

The average yearly wind velocity in Suffolk is 7 to 9 MPH. Table 25 shows the annual mean wind speed (MPH) for various directions at the Suffolk County Airport for the years 1943 to 1945 and 1951 to 1967.

**UNUSUAL WEATHER PHENOMENA**

According to the 1986 and 1987 *Storm Data Reports* available since the 1987 Annual Environmental Report, from November, 1986 through July, 1987, published by NOAA and the Federal Emergency Management Agency, the following unusual weather phenomena were recorded for coastal New York and Suffolk County.

- December 3, 1986 - A storm moving northward along the Atlantic coast produced tides 1 1/2 to 2 1/2 feet above normal. This and heavy surf combined to produce major beach erosion and coastal flooding along the southern shore of Suffolk County, especially in the Hamptons.
- January 2, 1987 - A storm moving northeastward along the coast dumped a couple of inches of rain in Suffolk County. Storm tides combined with rare astronomically high tides caused extensive coastal flooding. In Westhampton Beach on Long Island, one house was destroyed and 3 others severely damaged. Coastal flooding was mainly confined to the south shore towns of Babylon, Fire Island and the Hamptons, causing severe beach erosion and partial dune loss.
- February 23, 1987 - Heavy snow accumulated to 5 to 8 inches over sections of Suffolk County. Traveling was hazardous with many minor accidents being reported.
- April 4, 1987 - Strong winds associated with a slow moving storm hit Suffolk County downing several trees. Some of these trees fell on power lines and 1,000 customers in Suffolk County lost power.

**AIR QUALITY**

Basically, Suffolk's air quality remains satisfactory with no major pollution problems except for ozone affecting large areas throughout the county. Table 26 is a summary of federal and state ambient air standards for sulfur dioxide, carbon monoxide, ozone, hydrocarbons, suspended particulates and lead. In addition, New York State also has standards for *Beryllium, Fluorides, Hydrogen Sulfide and Settleable Particulates* (dustfall). All of the pollutants, other than ozone, are considered to be within standards throughout the county.

New York State Department of Environmental Conservation (NYSDEC) publishes an annual N.Y.S. Air Quality Report, the latest one being for 1986. Suffolk County lies within the metropolitan *Air Quality Control Region* (AQCR). Mobile and stationary air pollution sources in Suffolk County come under the same strict emission limits as New York City and Western Nassau County. As such, automobile emission failure levels have been made tighter, additional emission controls are being placed on gasoline service stations and gasoline transport vehicles, and consumer products will be limited as to *Volatile Organic Compound* (VOC) content. The industrial sector feels the effect of restrictive regulations that limit solvent emissions from paint spraying operations and coating lines as well as printing and packaging firms. In Suffolk County, there is only one continuous air quality monitoring site - in Babylon. Analysis of the various primary air contaminants, as stated in the 1986 NYSDEC report is as follows.

**1. Sulfur Dioxide**

Sulfur dioxide levels in the Nassau-Suffolk region continue to be well below the primary standard of which the 12 month average is not to exceed 0.03 ppm (by volume).

The annual mean during 1986 was approximately 0.011 ppm throughout the region. The SO2 concentrations at the Babylon monitoring site have been relatively constant during the last five years. Table 27 shows the annual averages for sulfur dioxide concentrations measured at the Babylon site for 1977 through 1986.

In addition, Table 28 contains information obtained from six sites of the Long Island Lighting Company's continuous air monitoring system within Suffolk which shows SO2 ambient levels well below air quality standards for the past ten years.

The Port Jefferson monitor and the Babylon monitors have had higher levels than the other sites on a long term basis, but the annual sulfur dioxide levels at these locations still remain relatively low.

**2. Carbon Monoxide**

The long term trend in eight hour carbon monoxide concentrations, as well as the number of contraventions of the eight hour air quality standard, have generally declined at all sites in the metropolitan AQCR during the past few years, reflecting, at least in part, the increasing proportion of motor vehicles with exhaust emission controls. Eisenhower Park (the closest station where carbon monoxide is measured), located in an area of fairly high traffic density, has always experienced CO levels higher than other non-urban sites and recorded a total of 94 running eight hour values exceeding 9 ppm in 1975. In succeeding years, however, this total has generally declined and reached an all-time low of only 7 during 1980. Although this value increased to 14 in 1981, due mainly to exceedances occurring in November and December during periods of poor dispersion conditions, it is still the second lowest total measured at this site. The number of days during which eight hour exceedances were measured has likewise decreased from 20 in 1975 to only a single day in 1980 and 3 days in 1981. The overall 7-year trend in eight hour concentrations at Eisenhower Park shows a maximum eight hour value of 16.0 ppm in 1975 which has declined to a level of 10.3 ppm in 1984 and 8.6 ppm in 1985, though in 1986 the concentration increased to 10.4 ppm. In 1984, the running eight hour average standard of 9 ppm was exceeded 11 times. It was not exceeded in 1985 and was exceeded once in 1986.

**TABLE 23**
**Monthly Total Heating Degree Days**
**for Six Sites in Suffolk County, New York**
**1980-81, 1981-82, 1982-83, 1983-84, 1984-85, 1985-86 and 1986-87**

| Site | Season | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Total | Norms July-Jun |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vanderbilt Museum | 1980-81 | 0 | 0 | 33 | 317 | 644 | 994 | 1234 | 766 | 777 | 357 | 137 | 8 | 5267 | 5174 |
| | 1981-82 | 0 | 0 | 58 | 332 | 558 | 930 | 1230 | 875 | 777 | 466 | 108 | 55 | 5389 | |
| | 1982-83 | 0 | 10 | 32 | 263 | 496 | 728 | 943 | 875 | 717 | 452 | 214 | 8 | 4738 | |
| | 1983-84 | 0 | 5 | 47 | 274 | 525 | 928 | 1112 | -- | -- | -- | -- | -- | 2891* | |
| | 1984-85 | 2 | 0 | 86 | 186 | -- | -- | 1167 | 900 | 729 | 414 | 138 | 50 | 3672* | |
| | 1985-86 | 0 | 0 | 24 | 276 | -- | 975 | 1024 | 981 | 748 | -- | 126 | 16 | 4120* | |
| | 1986-87 | 1 | 7 | 37 | 270 | 598 | 815 | 1011 | 946 | 677 | 110 | 176 | 7 | 4955 | |
| Patchogue | 1980-81 | 0 | 0 | 59 | 373 | 658 | 1032 | 1393 | 814 | 811 | 439 | 207 | 15 | 5711 | 5664 |
| | 1981-82 | 0 | 6 | 77 | 406 | 590 | 964 | 1254 | 870 | 813 | 545 | 164 | 73 | 5762 | |
| | 1982-83 | 5 | 12 | 60 | 314 | 489 | 756 | 973 | 863 | 723 | 473 | 269 | 20 | 4957 | |
| | 1983-84 | 0 | 4 | 71 | 316 | 545 | 949 | 1154 | 762 | 924 | 486 | 231 | 34 | 5476 | |
| | 1984-85 | 4 | 0 | 114 | 228 | 580 | 739 | 1172 | 880 | 674 | 414 | 177 | 44 | 5026 | |
| | 1985-86 | 0 | 0 | 57 | 265 | 512 | 992 | 994 | 961 | 729 | 424 | 153 | 24 | 5111 | |
| | 1986-87 | 4 | 19 | 71 | 318 | 632 | 854 | 1045 | 934 | 689 | 410 | 221 | 13 | 5210 | |
| Setauket | 1980-81 | 0 | 0 | 33 | 316 | 619 | 1029 | 1255 | 793 | 780 | 376 | 181 | 12 | 5394 | 5208 |
| | 1981-82 | 0 | 0 | 69 | 374 | 572 | 948 | 1252 | 888 | 821 | 506 | 152 | 70 | 5652 | |
| | 1982-83 | 3 | 7 | 54 | 274 | 485 | 717 | 961 | 866 | 737 | 455 | 244 | 22 | 4825 | |
| | 1983-84 | 0 | 7 | 53 | 278 | 550 | 918 | 1110 | 751 | 902 | 482 | 203 | 30 | 5284 | |
| | 1984-85 | 0 | 0 | 94 | 197 | 531 | 714 | 1140 | 861 | 663 | 384 | 136 | 39 | 4759 | |
| | 1985-86 | 0 | 0 | 43 | 236 | 466 | 956 | 978 | 982 | 718 | 424 | 149 | 22 | 4974 | |
| | 1986-87 | 2 | 14 | 52 | 272 | 593 | 828 | 1014 | 916 | 699 | 427 | 181 | 17 | 5015 | |
| Riverhead | 1980-81 | 0 | 0 | 42 | 325 | 659 | 1036 | 1273 | 1053 | 814 | 425 | 188 | 9 | 5561 | 5324 |
| | 1981-82 | 0 | 4 | 64 | 368 | 572 | 954 | 1238 | 892 | 801 | 534 | 139 | 66 | 5632 | |
| | 1982-83 | 0 | 10 | 61 | 294 | 471 | 710 | 949 | 843 | 707 | 454 | 211 | 9 | 4719 | |
| | 1983-84 | 0 | 5 | 51 | 285 | 539 | 935 | 1124 | 764 | 917 | 481 | 181 | 22 | 5304 | |
| | 1984-85 | 0 | 0 | 114 | 254 | 606 | 764 | 1153 | 882 | 686 | 399 | 150 | 39 | 5047 | |
| | 1985-86 | 0 | 0 | 57 | 262 | 486 | 999 | 992 | 960 | 724 | 431 | 150 | 14 | 5075 | |
| | 1986-87 | 1 | 13 | 43 | 258 | 602 | 827 | 1013 | 930 | 688 | 405 | 168 | 5 | 4971 | |
| Bridgehampton | 1980-81 | 0 | 1 | 71 | 391 | 683 | 1058 | 1306 | 817 | 863 | 493 | 240 | 27 | 5947 | 5627 |
| | 1981-82 | 0 | 10 | 94 | 417 | 612 | 961 | 1271 | 906 | 850 | 620 | 229 | 112 | 6097 | |
| | 1982-83 | 6 | 29 | 100 | 366 | 532 | 789 | 987 | 856 | 762 | -- | 325 | 39 | 4791* | |
| | 1983-84 | 4 | 7 | 80 | 351 | 578 | 975 | 1128 | 780 | 948 | 543 | 271 | 41 | 5706 | |
| | 1984-85 | 0 | 0 | 125 | 272 | 612 | 753 | 1204 | 902 | 733 | 484 | 245 | 72 | 5402 | |
| | 1985-86 | 0 | 2 | 83 | 294 | 501 | 1005 | 1012 | 979 | 795 | 499 | 229 | 38 | 5437 | |
| | 1986-87 | 6 | 32 | 119 | 362 | 649 | 852 | 1061 | 989 | 758 | 500 | 288 | 32 | 5648 | |
| Greenport | 1980-81 | 0 | 0 | 54 | 325 | 597 | 1055 | 1243 | 823 | 863 | 445 | 202 | 17 | 5624 | 5628 |
| | 1981-82 | 0 | 5 | 69 | 327 | 561 | 924 | 1275 | 914 | 853 | 610 | 207 | 97 | 5842 | |
| | 1982-83 | 4 | 11 | 41 | 301 | 445 | 742 | 984 | 896 | 720 | 507 | 264 | 29 | 4944 | |
| | 1983-84 | 1 | 10 | 53 | 285 | 500 | 915 | 1139 | 800 | 947 | 547 | -- | 42 | 5239* | |
| | 1984-85 | 2 | 0 | 98 | 206 | 498 | 729 | 1157 | 913 | 766 | 466 | 175 | 57 | 5067 | |
| | 1985-86 | 0 | 0 | 46 | 234 | 477 | 950 | 1025 | 965 | 799 | 468 | -- | 46 | 5010* | |
| | 1986-87 | 3 | 23 | 77 | 310 | 626 | 830 | 1055 | 983 | 762 | 486 | 277 | 28 | 5460 | |

* Based on partial data.

**TABLE 24**
**Monthly Total Cooling Degree Days**
**for Six Sites in Suffolk County, New York**
**1982 - 1987**

| Site | Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total | Norms Jan.-Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vanderbilt Museum | 1982 | 0 | 0 | 0 | 0 | 31 | 93 | 321 | 223 | 92 | 19 | 3 | 0 | 782 | |
| | 1983 | 0 | 0 | 0 | 6 | 4 | 193 | 369 | 323 | 209 | 21 | 0 | 0 | 1125 | 734 |
| | 1984 | 0 | -- | -- | -- | -- | -- | 229 | 285 | 70 | 4 | -- | -- | -- | |
| | 1985 | 0 | 0 | 0 | 0 | 45 | 67 | 252 | 230 | 133 | 8 | -- | 0 | -- | |
| | 1986 | 0 | 0 | 0 | -- | 95 | 147 | 290 | 241 | 70 | 17 | 0 | 0 | 860* | |
| | 1987 | 0 | 0 | 0 | 0 | 76 | 205 | 331 | 235 | 91 | -- | -- | 0 | 958* | |
| Patchogue | 1982 | 0 | 0 | 0 | 0 | 15 | 72 | 268 | 207 | 64 | 10 | 2 | 0 | 638 | |
| | 1983 | 0 | 0 | 0 | 0 | 0 | 149 | 315 | 285 | 180 | 22 | 0 | 0 | 951 | 608 |
| | 1984 | 0 | 0 | 0 | 0 | 2 | 187 | 236 | 293 | 55 | 7 | 0 | 0 | 780 | |
| | 1985 | 0 | 0 | 0 | 2 | 14 | 68 | 270 | 238 | 121 | 3 | 0 | 0 | 716 | |
| | 1986 | 0 | 0 | 0 | 0 | 72 | 140 | 254 | 227 | 64 | 30 | 0 | 0 | 827 | |
| | 1987 | 0 | 0 | 0 | 1 | 46 | 189 | 326 | 205 | 81 | 2 | 0 | 0 | 849 | |
| Setauket | 1982 | 0 | 0 | 0 | 0 | 18 | 67 | 274 | 198 | 65 | 14 | 3 | 0 | 639 | |
| | 1983 | 0 | 0 | 0 | 2 | 0 | 138 | 310 | 281 | -- | -- | 0 | 0 | 731* | 741 |
| | 1984 | 0 | 0 | 0 | 0 | 11 | 208 | 235 | 292 | 61 | 6 | 0 | 0 | 813 | |
| | 1985 | 0 | 0 | 0 | 0 | 52 | 76 | 265 | 234 | 119 | 9 | 0 | 0 | 755 | |
| | 1986 | 0 | 0 | 0 | 0 | 76 | 138 | 279 | 201 | 60 | 22 | 0 | 0 | 776 | |
| | 1987 | 0 | 0 | 0 | 0 | 68 | 170 | 290 | 180 | 64 | 0 | 0 | 0 | 772 | |
| Riverhead | 1982 | 0 | 0 | 0 | 0 | 24 | 64 | 270 | 167 | 54 | 6 | 0 | 0 | 585 | |
| | 1983 | 0 | 0 | 0 | 1 | 2 | 172 | 321 | 285 | 196 | 19 | 0 | 0 | 996 | 705 |
| | 1984 | 0 | 0 | 0 | 0 | 12 | 233 | 256 | 303 | 48 | 1 | 0 | 0 | 853 | |
| | 1985 | 0 | 0 | 0 | 1 | 41 | 76 | 262 | 224 | 106 | 3 | 0 | 0 | 713 | |
| | 1986 | 0 | 0 | 0 | 0 | 72 | 140 | 294 | 227 | 64 | 30 | 0 | 0 | 827 | |
| | 1987 | 0 | 0 | 0 | 0 | 63 | 205 | 363 | 221 | 86 | 1 | 0 | 0 | 939 | |
| Bridgehampton | 1982 | 0 | 0 | 0 | 0 | 6 | 24 | 207 | 109 | 28 | 0 | 0 | 0 | 374 | |
| | 1983 | 0 | 0 | 0 | -- | 0 | 82 | 239 | 201 | 158 | 12 | 0 | 0 | 692* | 495 |
| | 1984 | 0 | 0 | 0 | 0 | 0 | 147 | 188 | 255 | 36 | 3 | 0 | 0 | 629 | |
| | 1985 | 0 | 0 | 0 | 0 | 4 | 39 | 227 | 190 | 83 | 1 | 0 | 0 | 544 | |
| | 1986 | 0 | 0 | 0 | 0 | 31* | 80 | 193 | 149 | 37 | 17 | 0 | 0 | 507* | |
| | 1987 | 0 | 0 | 0 | 0 | 34 | 121 | 227 | 135 | 54 | 0 | 0 | 0 | 571 | |
| Greenport | 1982 | 0 | 0 | 0 | 0 | 2 | 35 | 261 | 193 | 64 | 0 | 1 | 0 | 556 | |
| | 1983 | 0 | 0 | 0 | 1 | 1 | 127 | 274 | 254 | 207 | 16 | 0 | 0 | 880 | 478 |
| | 1984 | 0 | 0 | 0 | 0 | 5 | 165 | 220 | 267 | 72 | 3 | 0 | 0 | 732 | |
| | 1985 | 0 | 0 | 0 | 0 | 17 | 46 | 247 | 227 | 89 | 7 | 0 | 0 | 633 | |
| | 1986 | 0 | 0 | 0 | 0 | 35 | 92 | 213 | 218* | 44 | 17 | 0 | 0 | 619* | |
| | 1987 | 0 | 0 | 0 | 0 | 27 | 117 | 268 | 173 | 61 | 0 | 0 | 0 | 646 | |

-- Data not recorded.
* Based on partial data.

**TABLE 25**
**Annual Mean Wind Speed (MPH For Various Directions)**

| | | | |
|---|---|---|---|
| N | 7.3 | NNE | 7.7 |
| NE | 8.4 | ENE | 8.6 |
| E | 8.3 | ESE | 8.1 |
| SE | 7.0 | SSE | 6.8 |
| S | 6.9 | SSW | 7.7 |
| SW | 8.2 | WSW | 7.7 |
| W | 6.7 | WNW | 8.2 |
| NW | 8.7 | NNW | 8.2 |

Source: Frizzola, 1975

**TABLE 26**
**Summary of Ambient Air Standards**
**Federal and State**
**June 1979**

| | | New York Standards | | | | Corresponding Federal Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Primary | | | Secondary | |
| Contaminant | Averaging Period | Level | Conc. | Units | Statistic[2] | Conc. | Units | Stat. | Conc. | Units | Stat. |
| Sulfur Dioxide | 12 Consecutive | | | | A.M. (Arith. Mean of | | | | | | |
| $SO_2$ | Months | ALL | 0.03 | PPM | 24 hr. avg. concen.) | 80 | $\mu g/m^3$ | A.M. | | | |
| | 24-HR | ALL | 0.14[3] | PPM | MAX.[2] | 365 | $\mu g/m^3$ | MAX.[2] | | | |
| | 3-HR | ALL | 0.50[4] | PPM | MAX. | 1300 | | | 1300 | $\mu g/m^3$ | MAX. |
| Carbon Monoxide | 8-HR | ALL | 9 | PPM | MAX. | 10 | $mg/m^3$ | MAX. | 10 | $mg/m^3$ | MAX. |
| CO | 1-HR | ALL | 35 | PPM | MAX. | 40 | $mg/m^3$ | MAX. | 40 | $mg/m^3$ | MAX. |
| Ozone | 1-HR | ALL[8] | 0.12 | PPM | MAX. | 235 | $\mu g/m^3$ | MAX. | 235 | $\mu g/m^3$ | MAX. |
| (Photochemical Oxidants) | | | | | | | | | | | |
| Hydrocarbons | 3-HR | | | | | | | | | | |
| (Non-Methane) | (6-9 A.M.) | ALL | 0.24 | PPM | MAX. | 160 | $\mu g/m^3$ | MAX. | 160 | $\mu g/m^3$ | MAX. |
| Nitrogen | 12 Consecutive | | | | | | | | | | |
| Dioxide | Months | ALL | 0.05 | PPM | A.M. | 100 | $\mu g/m^3$ | A.M. | 100 | $\mu g/m^3$ | A.M. |
| Particulates | 12 Consecutive | IV | 75 | $\mu g/m^3$ | G.M. | 75 | $\mu g/m^3$ | G.M. | 60[6] | $\mu g/m^3$ | G.M. |
| (Suspended) TSP | Months | III | 65 | $\mu g/m^3$ | (Geometric mean of | | | | | | |
| | | II | 55 | $\mu g/m^3$ | 24 hr. average | | | | | | |
| | | I | 45 | $\mu g/m^3$ | concentrations) | | | | | | |
| | 24-HR | ALL | 250 | $\mu g/m^3$ | Max. | 260 | $\mu g/m$ | MAX. | 150 | $\mu g/m$ | MAX. |
| | 30 Days[7] | IV | 135 | $\mu g/m^3$ | A.M. | | | | | | |
| | | III | 115 | $\mu g/m^3$ | A.M. | | | | | | |
| | | II | 100 | $\mu g/m^3$ | A.M. | | | | | | |
| | | I | 80 | $\mu g/m^3$ | A.M. | | | | | | |
| | 60 Days[7] | IV | 115 | $\mu g/m^3$ | A.M. | | | | | | |
| | | III | 95 | $\mu g/m^3$ | A.M. | | | | | | |
| | | II | 85 | $\mu g/m^3$ | A.M. | | | | | | |
| | | I | 70 | $\mu g/m^3$ | A.M. | | | | | | |
| | 90 Days[7] | IV | 105 | $\mu g/m^3$ | A.M. | | | | | | |
| | | III | 90 | $\mu g/m^3$ | A.M. | | | | | | |
| | | II | 80 | $\mu g/m^3$ | A.M. | | | | | | |
| | | I | 65 | $\mu g/m^3$ | A.M. | | | | | | |
| Lead | 3 Consecutive[9] Months | | | | | 1.5 | $\mu g/m^3$ | MAX. | | | |

[1] N.Y.S. also has standards for Beryllium, Fluorides, Hydrogen Sulfide and Settleable Particulates (Dustfall).
[2] All maximum values are values not to be exceeded more than once a year (Ozone std. not to be exceeded during more than one day per year).
[3] Also during any 12 consecutive months, 99% of the values shall not exceed 0.10 ppm (not necessary to address this standard when predicting future concentrations).
[4] Also during any 12 consecutive months 99% of the values shall not exceed 0.25 ppm (see above).
[5] Gaseous concentrations are corrected to a reference temperature of 25°C and to a reference pressure of 760 millimeters of Mercury.
[6] As a guide to be used in assessing implementation plans to achieve 24-hour standard.
[7] For enforcement only, monitoring to be done only when required by N.Y.S., (not necessary to address this standard when predicting future concentrations).
[8] Existing N.Y.S. standards for Photochemical Oxidants (Ozone) of 0.08 ppm not yet officially revised via regulatory process to coincide with new Federal standard of 0.12 ppm which is currently being applied to determine compliance status.
[9] New Federal standard for lead not yet officially adopted by N.Y.S. but is currently being applied to determine compliance status.

**TABLE 27**
**Sulfur Dioxide - Annual Average in Parts per Million (PPM)**
**1976 - 1986**

| Station | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|
| Babylon | - | 0.020 | 0.010 | 0.008 | 0.009 | 0.011 | 0.010 | 0.012 | 0.011 | 0.011 |

**TABLE 28**
**Sulfur Dioxide - Annual Averages in Parts per Million (PPM)**
**from the Long Island Lighting Company**
**Continuous Air Monitoring System**
**1976 - 1986**

| Station | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|---|
| Huntington | 0.010 | 0.008 | 0.007 | 0.006 | 0.008 | 0.009 | 0.008 | 0.007 | 0.005 | 0.008 |
| Port Jefferson | 0.012 | 0.010 | 0.009 | 0.010 | 0.010 | 0.011 | 0.010 | 0.011 | 0.011 | 0.011 |
| Terryville* | 0.009 | 0.008 | 0.006 | 0.006 | 0.009 | 0.007 | - | - | - | - |
| Setauket | 0.010 | 0.009 | 0.007 | 0.008 | 0.007 | 0.066 | 0.009 | 0.008 | 0.010 | 0.008 |
| Mt. Sinai | - | - | - | - | - | 0.003 | 0.007 | 0.010 | 0.010 | 0.010 |
| Crab Meadow** | - | - | - | - | - | - | - | - | - | 0.007 |

*Terryville station moved to Mt. Sinai as a result of recommendations contained in a modeling study.

**This station was added to the system in 1985 with reporting, for regulatory perposes,beginning in 1986.

No carbon monoxide monitoring site in the Nassau-Suffolk region exceeded 35 ppm from 1984 to 1986. However, due to its close proximity to New York City, the EPA in early 1988 has designated Nassau-Suffolk as nonattainment areas for carbon monoxide as well. The NYSDEC is currently challening the decision, which, if it stands, could limit or put a moratorium on major development in the region.

**3. Ozone**

During 1984 there were no exceedances of the one-hour ozone standard of 0.12 ppm, as monitored at the Babylon station. This is the first time that no violations have been recorded since the station has been in operation. However, in 1985 the one-hour ozone standard of 0.12 ppm was exceeded 3 times, and 4 times in 1986, at the Babylon station. Table 29 shows the annual averages for ozone at the Babylon and Eisenhower Park stations for 1978 through 1986, as well as the number of days that the one-hour average of 0.12 ppm was exceeded during 1985.

**4. Oxides of Nitrogen**

Since 1980, the Eisenhower Park site (the closest station where oxides of nitrogen are measured) has been monitoring via EPA equivalent instrumentation. For the past eight years, the nitric oxide (NO) levels and nitrogen dioxide ($NO_2$) have been holding relatively constant at levels of between 0.048 and 0.057 ppm and 0.026 and 0.036 respectively. Whether or not this represents a leveling off of these contaminants at a concentration just below standard ($NO_2$ only) or reflects the effect of a methodology change over remains unclear at this time.

**5. Total Suspended Particulates**

Total suspended particulate levels in Suffolk have decreased markedly during the sixteen year period 1971 to 1986. From initiation of sampling in the mid-1960's through 1971, most sites were in contravention of New York State and Federal standards with annual geometric means above 75 micrograms per cubic meter. Since 1971, nearly all sites have been brought into compliance with both short term (24 hour) and long (annual) standards. Table 30 shows the annual average suspended particulate levels for eight sites throughout Suffolk County from 1971 through 1986. Only the Babylon station is monitored at present.

**6. Lead**

The annual geometric mean at the lead sampling site in the region, the Eisenhower Park continuous monitor, shows a general downtrend between 1978 and 1986. The annual mean at Eisenhower Park has declined from 0.76 $\mu g/m^3$ in 1978 to 0.10 $\mu g/m^3$ in 1986. The New York State/Federal Air Quality standard for lead (maximum quarterly average of 1.5 micrograms per cubic meter) was contravened during 1973 at Eisenhower Park when quarterly averages of 1.51 and 1.85 $\mu g/m^3$ were attained. Since then, however, maximum quarterly averages at this site have remained well below 1.5 $\mu g/m^3$. As was noted in the discussion on carbon monoxide, this site is located near a major road and is also close to Roosevelt Raceway. Thus, it is often subject to vehicular emissions, including lead. Because the Eisenhower Park site is influenced by automotive emissions, the use of low lead gasoline has undoubtedly contributed to the drop in atmospheric lead concentrations at that site.

**PROBLEM AREAS**

As mentioned in previous Annual Environmental Reports, oxidant exposures within Suffolk, as measured at Babylon, may continue to exceed federal and state standards (though 1984 did not show any violation), and it is still contended that the sources of these levels appear to originate from areas to the West, such as New York City and Northeastern New Jersey. An overview of the health effects resulting from high oxidant levels can be found in the 1982 Annual Environmental Report.

The Suffolk County Department of Health Services (SCDHS) Air Pollution Control staff is being asked to assist members of the police and fire emergency services in assessing the potential for impact from exposure to toxic materials. The use of synthetics in society has grown at an ever increasing rate resulting in the release of toxic compounds during fires at residential as well as commercial and industrial facilities. SCDHS has been cooperating to provide on-site guidance, as needed.

In addition, failures of underground gasoline storage tanks have resulted in complex programs of house monitoring for the presence of benzene, toluene and xylene. Where concentrations of contaminants exceed guideline levels, appropriate guidance is given to the persons impacted.

**TABLE 29**
**Ozone - Continuous Chemiluminescence**
**Annual Averages 1978 through 1986**
**- and -**
**Comparison Between New York State Ambient Air Quality and Ambient Air Quality Standards for Calendar Year 1986**

| Station (Encon Region) | Site # | Annual Arithmetic Mean (ppm) 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | One-Hour Average - 1985 # of Observations Total | % Avail. | 0.12 ppm | Highest Value (Daily) 1st | 2nd | 3rd | 4th | Number of Days With One-Hour Average Greater Than 0.12 ppm Not to Exceed an Expected Avg. of One/Calendar Yr. During the last 3 years 1984 M | E | 1985 M | E | 1986 M | E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Babylon (1)N | 5150-02N | .022 | .023 | .019 | .019 | .024 | .016 | .023 | .022 | 8515 | 97 | 2 | .160 | .157 | .136 | .130 | 0 | 0 | 3 | 3.6 | 4 | 40 |
| Eisenhower Pk. (1) | 2950-10 | .013 | .015 | .013 | .006 | .013 | * | * | * | | | | | | | | | | | | | |

*Station was removed from network in 1984.

M – Measured
E – Estimated

**TABLE 30**
**Total Suspended Particulates-High Volume Air Samplers**
**Annual Geometric Means 1971 through 1986**
**- and -**
**Comparison Between New York State Ambient Air Quality and Ambient Air Quality Standards for Calendar Year 1986**

| Station (Encon. Region) | Site No. | AAQS G.M. µg/m³* | Annual Geometric Mean (G.M.) Not to exceed AAQS (G.M.) µg/m³ 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | Total | 24-Hour Average - 1986 Maximum-Not to exceed 250 µg/m³ more than once per calendar year No. of Observations >150** µg/m³ | >250* µg/m³ | >260** µg/m³ | Highest Values µg/m³ 1st | 2nd | 3rd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pt. Jefferson | 5149.03 | 55 | – | – | – | 41 | 36 | 40 | 37 | 37 | 30 | 37 | 35 | 29 | 30 | *** | *** | *** | | *** | *** | *** | *** | *** | *** |
| Pt. Jefferson | 5149.04 | 55 | – | – | – | 49 | 44 | 51 | 47 | 42 | 37 | – | 35 | 38 | 35 | *** | *** | *** | | *** | *** | *** | *** | *** | *** |
| Babylon | 5150.01 | 65 | 63 | 52 | 55 | 59 | 54 | 53 | 56 | 42 | 46 | 59 | 54 | 40 | 44 | 44 | 44 | 45 | | 0 | 0 | 0 | 129 | 100 | 94 |
| Brookhaven | 5151.01 | 55 | 74+ | 57+ | 53 | 48 | 39 | 40 | 39 | – | 30 | 40 | 37 | 30 | 30 | *** | *** | *** | | *** | *** | *** | *** | *** | *** |
| Brookhaven | 5151.03 | 55 | 72+ | 47 | 41 | 40 | 38 | 42 | 39 | 32 | 30 | 40 | 39 | 31 | – | *** | *** | *** | | *** | *** | *** | *** | *** | *** |
| Islip | 5154.02 | 55 | 54 | 47 | 52 | 46 | 40 | 41 | 47 | 40 | 38 | 50 | 44 | 34 | 36 | *** | ** | ** | | *** | *** | *** | *** | *** | *** |
| Smithtown | 5157.04 | 55 | 43 | 47 | 48 | 48 | 44 | 48 | 52 | 36 | 36 | – | 37 | 35 | – | *** | ** | ** | | *** | *** | *** | *** | *** | *** |
| Southampton | 5158.01 | 45 | 35 | 34 | 43 | 35 | 27 | 30 | 31 | 29 | 24 | 34 | 34 | 26 | 27 | *** | ** | ** | | *** | *** | *** | *** | *** | *** |

* New York State Ambient Air Quality Standards (AAQS)
** Federal Ambient Air Quality Standards - Primary (260 µg/m³) and Secondary (150 µg/m³)
\+ Denotes a Contravention of N.Y. State Ambient Air Quality Standards
– Not Reported
*** Removed from System in 1984

## TRENDS

The concentrations of most primary air contaminants appear to be declining over the last ten years. These declines, according to the New York State Department of Environmental Conservation (NYSDEC), seem to be attributed in part to implementation of pollution control devices on vehicles, as well as the use of unleaded and low sulfur fuels and implementation of controls on stationary sources.

With the onset of the oil surplus and the apparent stabilization of home heating oil prices, at least for the time, it appears that the number of homes converting from oil heating to the use of wood and coal stoves continues to decrease, thus holding down air pollution resulting from the use of such equipment. Wood stoves, however, do generate a good number of nuisance complaints. Federal regulations have been proposed to establish emission limits for new wood stoves.

As discussed in past Annual Environmental Reports, the major indoor air pollutants, *formaldehyde, nitric oxide, carbon monoxide, soot, benzopyrene, asbestos, pesticides* and *radioactive radon* may be ever increasing problems due to the new breed of energy efficient homes.

## GOVERNMENTAL PROGRAMS AND ACTIVITIES

Table 31 is a summary of the major federal, state and county laws dealing with air quality.

### 1. Federal Government Programs

At the federal level, the *Clean Air Act* and its 1977 amendments are still under review by Congress. Recent efforts by the Reagan administration to lessen federal governmental regulations on business are currently expected to result in a weakening of the law. In addition, federal budget cutbacks in the environmental area are directly impacting air quality programs at the state and local levels. Acid rain continues to be the center of controversy.

### 2. New York State Programs

NYSDEC generated revisions to its original *State Implementation Plan* (SIP), which were accepted by U.S.E.P.A. The SIP contains the provisions by which the State of New York will maintain ambient air quality statewide and bring those areas where air quality standards are being exceeded into compliance. Ozone control via reduction of hydrocarbon emission is the only pollutant for which a standard is being exceeded.

### 3. Suffolk County Programs

The air quality program conducted by the Suffolk County Department of Health Services Bureau of Pollution Control, as agent for NYSDEC resulted in the following:

| | 1987 | 1986 |
|---|---|---|
| - Renewals | 562 | 290 |
| - Reviews of Permits to Construct or Certificates to Operate Sources of Air Contamination | 289 | 290 |
| - Complaints Received | 927 | 732 |
| - Air Samples Collected | 1672 | 1600* |
| - Number of Cases in which Formal Legal Action was Initiated | 10 | 28 |

* Estimate

In addition, the Department of Health Services' Office of Water Resources operates precipitation, temperature and wind speed monitoring equipment at Belmont Lake, Medford and Riverhead, and raw data is collected weekly. Precipitation quality is also taken at the Medford site. The precipitation data is the only information analyzed on a regular basis.

## EXTENT OF IMPLEMENTATION OF PREVIOUS RECOMMENDATIONS

The Bureau of Pollution Control increased its staff and participated in numerous training programs so as to be able to both operate the Permit/Certificate Program efficiently as well as to respond to emergencies and implement special programs, such as the Bluebell Lane gasoline spill investigation. Though the mobile air quality sampling laboratory is operational, a longer than expected training period was necessary. It is foreseen that the laboratory will be of great use to the various emergency response/pollution investigation groups within county government.

## RECOMMENDATIONS

The Bureau of Pollution Control of the Department of Health Services should continue to upgrade its various programs.

**TABLE 31**
**Federal, State and County Laws Dealing With Air Quality**

| Name (Citation) | Administering Agency | Primary Purpose | Major Provisions |
|---|---|---|---|
| **FEDERAL** | | | |
| Clean Air Act of 1962 and Amendments (42 U.S.C. 7401 et. seq.) | Environmental Protection Agency | To achieve and maintain air quality to protect public health and welfare. The Congressional philosophy being that the prevention and control of air pollution at its source is the primary responsibility of the State and local governments. | 1. Authorizes federal emission standards for new vehicles and required auto standards to be effective in 1975 and 1976.<br>2. Establish National Ambient Air Quality Standards. *Primary* standards to protect public health and *secondary* standards to protect public welfare.<br>3. Each state is required under Section 110 to submit for EPA approval an implementation plan (SIP) outlining the state's strategy for attaining and maintaining the national ambient air quality standards within deadlines.<br>4. Section 111 requires EPA to establish performance standards for new and modified sources and keep new pollution to a minimum.<br>5. Section 112 allows EPA to establish standards on any hazardous emissions causing serious illness or mortality.<br>6. Requires states to designate areas failing to attain the national ambient standards (nonattainment areas) and areas which meet the standards as well as new requirements governing such designated areas. |
| **STATE** | | | |
| Energy Supply and Environmental Coordination Act of 1974 (PL 93-319) | Federal Energy Administration | To provide for a means to assist in meeting the essential need of the United States for fuels. | 1. Amends the Clean Air Act by authorizing EPA to issue orders permitting sources converting to coal to delay compliance with applicable SIP emission limits until 1985. |
| National Climate Program | National Climate | To establish a national climate program that will assist the Nation and the world to understand and respond to natural and man-induced climate processes and their implications. | 1. To provide for a national climate program.<br>2. To develop a *Climate Plan.*<br>3. To provide climate information and data.<br>4. To develop an understanding of climatological processes.<br>5. To respond to impacts and policy implications as they relate to climate.<br>6. To coordinate all federal climate related programs within various agencies.<br>7. To provide for implementation of the National Climate Plan. |
| Environmental Conservation Law Article 19-Air Pollution Control (L.1972, c.664, Sect.2) | Department of Environmental Conservation | It is the purpose of this article to safeguard the air resources of the state from pollution by: (1) controlling or abating air pollution which shall exist when this article shall be enacted and (2) preventing new air pollution, under a program which shall be consistent with the declaration of policy above stated and in accordance with the provisions of this article. | 1. Formulate, adopt and promulgate, amend and repeal codes and rules and regulations for preventing, controlling or prohibiting air pollution in the state.<br>2. Promulgate standards for composition of fuels in attainment and nonattainment areas.<br>3. Promulgate standards for crankcase ventilating systems and air contaminant emission control systems in accordance with the Vehicle and Traffic Law.<br>4. Hold public hearings, conduct investigations, compel the attendance of witnesses, receive such pertinent and relevant proof and do such other things as it may deem to be necessary, proper or desirable in order that it may effectively discharge its code, rule and regulation making duties and responsibilities under this article.<br>5. It shall be the duty and responsibility of the DEC to prepare and develop a general comprehensive plan for the control or abatement of existing air pollution and for the control or prevention of any new air pollution recognizing varying requirements for different areas of the state.<br>6. Promulgate standards for the use of fuel or fuel additives for use in motor vehicles or motor vehicle engines, taking due recognition of federal standards and requirements. |

**TABLE 31 (Cont'd.)**
**Federal, State and County Laws Dealing With Air Quality**

| Name (Citation) | Administering Agency | Primary Purpose | Major Provisions |
|---|---|---|---|
| Air Pollution Control Rules 6 NYSRR Chapter III Subchapter 6 | Department of Environmental Conservation or local Dept. of Health | Implementation of N.Y. Air Pollution Control Law | Part 201-Requires issuance of permits for construction or alteration of a source of air contamination.<br>Part 202-Stack sampling may be required when it is believed a source of air pollution may be violating law.<br>Part 204-Limits hydrocarbon emissions from storage and loading facilities in New York metropolitan area.<br>Part 205-Limits the emission of organic solvents into the atmosphere of the New York metropolitan area.<br>Part 207-Requires the establishing of Episode Action Plans.<br>Part 211-Restricts the opacity or density of a visible emission-also puts restrictions on odors (Pending final approval).<br>Part 212-Outlines requirement for industrial exhaust and ventilation systems.<br>Part 215-Open burning prohibition.<br>Part 217-Defines and sets limits for motor vehicle emissions (gasoline engines).<br>Part 218-Defines and sets limits for Diesel engine visible emissions.<br>Part 220-Standard and procedures for reducing emissions from Portland Cement Plants.<br>Part 221-Prohibits the spraying of asbestos or asbestos containing materials.<br>Part 222-Sets standards for incinerator usage in the New York metropolitan area.<br>Part 225-Standards for fuel composition and use in the New York metropolitan area. |
| **COUNTY** | | | |
| Suffolk County Sanitary Code, Article X-Air Pollution Control | Department of Health Services | To safeguard the air resources of the County of Suffolk from pollution by controlling and abating existing air pollution and preventing new pollution. | Allows the control of air pollution from fuel burning equipment, incinerators, open burning, vehicle idling, nuisance odors and sand blasting through a permit process. |

# OPEN SPACE

## INTRODUCTION

Open space lands provide valuable scenic, recreational and environmental assets to Suffolk County and serve to protect the high quality groundwater recharge areas that supply the County's underlying aquifer system. Protection of the aquifers will assure high quality drinking water for future generations. Open space lands also serve to protect surface water quality, prime wildlife habitats and unique, rare and endangered species habitats.

Open space in Suffolk County is acquired through donation, tax delinquency, exercise of eminent domain, purchase of development rights, outright purchase, zoning and subdivision regulations, and dedication of conservation easements. It includes vacant or undeveloped land, public, private and quasi-publicly owned open space (parkland, preserves, golf course, school and municipal recreation sites), farmland and conservation easement areas. Low density development also provides some of the benefits of open space.

Suffolk County as well as all of the towns are using all available means to ensure future water quality and protect environmentally sensitive areas.

## STATE OF OPEN SPACE ACQUISITIONS

### 1. 1987 Open Space Acreage

In 1987, Suffolk County had 5,661 acres of federal parkland, 27,945 acres of New York State parks and preserves, 2,100 acres of wetlands owned by the New York State Department of Conservation and 22,061 acres of County-owned open space. Land owned jointly by more than one level of government totaled 557 acres. The town open space and park acreage totaled 12,164 acres. In addition to the publicly-owned open space, private groups, including the Nature Conservancy, owned 4,377 acres. The total amount of open space and parkland in Suffolk is 74,967 acres or 12.9% of the County's land area.

### 2. Recently Acquired Open Space

#### *New York Acquisitions*

The New York State Department of Environmental Conservation recently acquired 28 acres of wetlands on Long Beach Bay in Orient.

#### *Suffolk County Acquisitions*

Suffolk County is actively preserving open space to protect environmentally sensitive areas and future groundwater supplies. Two means of doing this are the County Open Space Program and the County Tax Lien Program. The Nature Conservancy is instrumental in negotiating and assisting the county with purchases.

The County Open Space Program, passed in 1986, allocated 60 million dollars for acquisitions. As of September 1, 1988 $22,823,603 had been spent preserving 2,446.7 acres. The Nature Conservancy is presently acting on the County's behalf in acquiring 240.7 acres. Another 110.3 acres have contracts in process. Table 32 lists recent acquisitions of property in the program. Table 33 is a listing of properties approved for acquisition under the program.

**Table 32**
**Open Space Recently Acquired by Suffolk County**

| Acreage | Name | Location |
|---|---|---|
| 618* | Maple Swamp | Flanders |
| 7 | Former Federal Property | Montauk |
| 30 | Port Jefferson Headlands | Port Jefferson |
| 20 | Red Creek | Hampton Bays |
| 71 | Cedar Swamp | Pine Valley |
| 48 | Orient Point | Orient |

*Added to 504 acres already acquired.

#### *Farmlands*

Suffolk County is still the leading agricultural County in New York State in terms of the market value of agricultural products sold.

Agricultural sales totaled $93,025,000 in 1982 according to the 1982 *Census of Agriculture*. Nursery and greenhouse products accounted for almost $42 million sales and poultry and poultry products accounted for $15 million. Over 23,000 acres of Suffolk County farmland is irrigated which represents 45 percent of all the irrigated farmland in New York State. The largest crop, occupying 18,998 acres, is still Irish Potatoes, although the acreage planted in potatoes has been decreasing sharply since 1974 when 27,219 acres were planted in potatoes. While the number of farms has been increasing, the total area in farms has been declining by about 900 acres, from 1969 to 1982, as shown in Table 34. The rate of decline in farm acreage has been decreasing since 1969.

**TABLE 34**
**Suffolk County Farmlands**

| Year | # of Farms | Acres in Farms | % of Total Land Area | Sales ($1,000) |
|---|---|---|---|---|
| 1982 | 797 | 49,898 | 8.6 | 93,025 |
| 1978 | 777 | 51,853 | 8.7 | 77,169 |
| 1974 | 737 | 55,397 | 9.3 | 68,190 |
| 1969 | 743 | 61,520 | 10.3 | NA |

The Suffolk County Farmland Preservation Program is finishing the final acquisition under Phase II. The following table shows a breakdown of all farmland development rights acquired by the County to date:

**TABLE 35**
**Suffolk County Farmland Development Rights Program**
**March 4, 1988**

| Town | Acquired Acres |
|---|---|
| Brookhaven | 46.8 |
| East Hampton | 124.0 |
| Huntington | 49.1 |
| Islip | 11.0 |
| Riverhead | 2,883.3 |
| Smithtown | 63.1 |
| Southampton | 700.9 |
| Southold | 830.7 |
| **Suffolk County** | **4,614.5** |

In the last year 94.4 acres of development rights were acquired in East Hampton, 30 in Riverhead and 14.5 in Southold.

Recently Suffolk County appropriated $10 million for Phase III of the *Farmland Preservation Program*. Any monies left over from Phase II will be added to Phase III.

Three Towns have their own farmland preservation programs to acquire development rights to farmland. The Town of Southold has authorization to spend $1.4 million for 361 acres. The Towns of East Hampton and Southampton have spent a total of $8.4 million to preserve 190 acres in East Hampton and 700 acres in Southampton.

**TABLE 33**
**Proposed Suffolk County Parklands**
**February 14, 1988**

| Parcel & Town | Total Acreage | Cluster Acreage | Publicly Owned | Acquisition | Status |
|---|---|---|---|---|---|
| 1. Crab Meadow addition - Huntington | 87 | 38 | - | 20 | |
| 2. Wicks/Froelich Farms - Huntington | 368 | - | 49 | 319 | |
| 3. Indian Hills C.C. - Huntington | 137 | - | - | 137 | |
| 4. Carlls River - Babylon | 76 | - | 45 | 28 | |
| 5. Bergen Point addition (Bulks Nursery) - Babylon | 11 | - | - | 11 | |
| 6. Fresh Pond Greenbelt - Huntington & Smithtown | 53 | - | - | 53 | |
| 7. Nissequogue River addition - Smithtown | 105 | 33 | 49 | 22 | |
| 8. Hauppauge C.C. - Smithtown | 136 | - | - | 136 | |
| 9. Deepwells Historic Site - Smithtown | 5 | - | - | 5 | |
| 10. San Souci Lakes addition - Islip | 35 | - | (1) | 20 | Partial Acquisition |
| 11. Mill Pond (San Souci) - Islip | 14 | - | - | 14 | |
| 12. Orowoc Creek addition - Islip | 43 | - | 16 | 27 | |
| 13. Port Jefferson Headlands addition - Brookhaven | 39 | - | - | 39 | Complete |
| 14. South Setauket Woods - Brookhaven | 201 | 10 | 104 | 87 | |
| 15. Camp Barstow - Brookhaven | 67 | - | - | 67 | Complete |
| 16. Carmans River addition - Brookhaven | 208 | 45 | 13 | 90 | |
| 17. Southaven Park addition - Brookhaven | 57 | - | 27 | 30 | |
| 18. Harborview | 17 | - | - | 17 | |
| 19. Terrels River - Brookhaven | 261 | - | - | 261 | |
| 20. Peconic River addition - Brookhaven, Riverhead | 900 | - | 101 | 588(4) | Partial Acquisition |
| 21. Robins Island - Southold | 460 | - | - | 460 | |
| 22. Inlet Pond addition - Southold | 2 | - | - | 2 | Complete |
| 23. Orient Point - Southold | 48 | - | - | 48 | |
| 24. Pine Barrens adjacent to County Center - Southampton | 680 | - | 31 | 604 | Partial Acquisition |
| 25. Maple Swamp - Southampton | 2,000 | - | - | 1,222 | Partial Acquisition |
| 26. Sears Bellow addition - Southampton | 195 | - | - | 195 | |
| 27. Parcel bet.Red Creek & Cty. Pk.- Southampton | 79 | - | - | 21 | Partial Acquisition |
| 28. Dwarf Pine Forest - Southampton | 4,000 | - | 850(2) | 373 | Nature Conservancy |
| 29. Long Pond - Southampton | 515 | 10 | 265 | 2(5) | Partial Acquisition |
| 30. Clam Island - Southampton | 19 | - | - | 19 | |
| 31. Montauk addition - East Hampton | 25 | - | (3) | 7 | Partial Acquisition |
| 32. Hither Woods - East Hampton | 588 | - | - | 588 | Complete |
| 33. Barcelona Neck addition - East Hampton | 819 | - | 479(6) | 340 | |
| **Total** | **11,967** | **136** | **2,249** | **5,730** | |

(1) 102 acres Scout Camp for future acquisition
(2) 600 County; 50 Nature Conservancy; 200 Unknown
(3) 7 Acres purchased from Federal Government
(4) 39 Individual lots have also been acquired
(5) 342 acres acquired by Nature Conservancy
(6) includes 141 state owned lands

A recent trend in subdivision is to dedicate the open space as an agricultural reserve area. This allows a portion of the subdivision to still be farmed, but it cannot be further subdivided. As part of a subdivision using transfer of development, development rights to 111 acres in Riverhead was donated to the County Farmland Preservation Program.

***County Tax Lien Program***

Tax lien parcels located adjacent to surface waters are recommended to remain in county ownership and dedicated to the Suffolk County Nature Preserve. This ensures that these parcels will not be developed.

There are several areas adjacent to surface waters where tax lien parcels have been retained by the county including several parcels in the Carll's River System in the Town of Babylon. Much of the remaining privately owned properties in this area are proposed for acquisition. In addition, several parcels have been taken through tax lien in the Patchogue Creek-Canaan Lake System in the Town of Brookhaven. These parcels have been dedicated to the Suffolk County Nature Preserve. Other areas where a smaller amount of parcels have been identified for protection of surface waters protection through dedication to Nature Preserve include Orowoc Creek, Awixa Creek, Penataquit Creek, Doxsee's Brook and Sampawam's Creek, all located in the Town of Islip.

***Nature Preserve***

In 1987, 27 parcels totalling 57.5 acres were formally dedicated by Suffolk County to the Nature Preserve system. These parcels, situated in Smithtown, Brookhaven, Riverhead, and Southampton, were dedicated because of their ecological and environmental significance possessing freshwater wetlands, pine barrens, dwarf pine plains, and coastal beach communities. These 1987 additions raise the number of parcels in the Nature Preserve system to 1713 encompassing approximately 1738 acres. Lands dedicated to the County's Nature Preserve are managed by the Division of Natural Resource Management of the Suffolk County Department of Parks.

The Division of Natural Resource Management completed, in 1987, an inventory of all parcels dedicated to the Nature Preserve system. This inventory involved the identification and delineation of preserve parcels on Suffolk County tax maps and a listed inventory containing the tax district, section, amount of acreage and number of parcels per tax section, the number of the dedicating resolution, and the general location of the preserve parcel. This inventory is updated as additional parcels are incorporated into the system.

In July of 1987 Suffolk County passed, through Resolution 722-87, a local law adopting the *Nature Preserve Handbook*. The handbook, a collaborative effort of the Division of Natural Resource Management, Suffolk County Department of Planning, and the Council on Environmental Quality, provides a framework for identifying and dedicating lands owned by Suffolk County that are appropriate for inclusion in the Nature Preserve system. The handbook, allows for several county agencies to recommend lands to be dedicated provides criteria of ecological/environmental significance which parcels must meet for inclusion and requires review of proposed dedications by the Council on Environmental Quality. Once incorporated into the Nature Preserve system, the Division of Natural Resource Management is responsible for undertaking or overseeing the development of a management plan, and is responsible for the long term management of these parcels.

***Bird Sanctuary***

Suffolk County adopted, in 1986, a local law establishing a County Bird Sanctuary system. The intent of this law is to preserve endangered/threatened bird species or populations and breeding, feeding, or nesting habitat for concentrations of more common bird species or populations found in Suffolk County owned properties by safeguarding the ecological features in those properties upon which the birds depend.

One parcel, 23.5 acres in size, was dedicated by the Legislature in 1987. Situated on the west side of the inlet to Port Jefferson Harbor, this parcel is an important breeding site for several species of waterbirds. It provides breeding habitat for the piping plover, a federally threatened species, and for least and common terns, state endangered and threatened species, respectively. Thirty pairs of least terns and twelve pairs of common terns utilized the parcel for nesting during the 1987 season.

Lands dedicated to the County Bird Sanctuary are managed by the Division of Natural Resource Management.

***Pine Barrens Review Commission***

In 1987 the Pine Barrens Review Commission approved subdivision totalling 847.2 acres. Of this, 355.1 acres, or 41.9%, was to be dedicated as open space or scenic easements. The majority of this was the Red Creek Ridge subdivision of 325 acres where 203 acres were to be dedicated. (See also the *Environmental Review and Enforcement* Chapter *Pine Barrens Review* Section).

## GOVERNMENTAL ACTIVITIES

### 1. Federal

The U.S. General Services Administration has reversed a decision to sell 850 acres of pine barrens in Manorville adjacent to the Grumman-Calverton Airport and a 30 acre tract in Calverton. This was a wise decision because the area was a potential crash site and would be adversely affected by noise from jets taking off and landing. The Long Island Regional Planning Board, the Suffolk County Planning Commission and the Suffolk County Pine Barrens Review Commission all strongly opposed the sale.

### 2. New York State

New York State is seeking to purchase 836 acres in Suffolk County in the first round of purchases under the 1986 Environmental Quality Bond Act. These are listed in Table 36.

**Table 36**

**Proposed Aquisition of Property under 1986 Environmental Quality Bond Act**

| Location | Acreage | Description |
|---|---|---|
| Edgewood Preserve | 96 | Oak Brush Plains |
| Rocky Point | 416 | Pine Barrens |
| Brookhaven-Southampton Border | 313 | Pine Barrens |
| Northwest Harbor | 9 | Water Access |
| East Marion | 2 | Water Access |

An additional 25 parcels totalling 6,875 acres are under consideration as secondary priorities (see also the *Marine Environment* section).

### 3. Suffolk County

The Suffolk County Water Protection Program is an innovative land preservation plan which is in the process of being finalized and then would need state approval. It seeks to extend the 1/4 cent sales tax, currently financing the Southwest Sewer District, which expires December 1, 1989.

This revenue would be earmarked for environmental purchases and programs allowing would allow for the preservation of 30,000 acres of pine barrens and providing clean safe water for all Suffolk residents. The program has been approved by the New York State Senate and Assembly and signed by Governor Cuomo. The plan would then need to be approved by voters in November. Anticipating approval the Suffolk County Legislative has approved $30 million in interim financing.

Other county activities include the County Open Space Program and the County Tax Lien Program discussed earlier in the Suffolk County Acquisitions Section.

**Suffolk County Water Authority**

The Water Authority is initiating an ongoing program of land acquisition in the watershed corridor to better protect water quality at their well sites. The initial appropriation for this purchase is two million dollars. They will coordinate their purchases with county and other levels of government.

***The Nature Conservancy***

The Nature Conservancy plays an integral part in county acquisitions by negotiating for properties, acquiring them and transferring them to county ownership. They also maintain their own network of open space which contains about 4,479 acres. Recently the Nature Conservancy has added one acre to its Sagg Swamp Preserve, 3 acres to the Wading River Marsh Preserve and 5 acres in the dwarf pine barrens.

**4. County and Town Programs**

***Tax Benefits for Private Donors of Open Space***

Under Section 247 of the New York State General Municipal Law, *any municipality may acquire, by purchase, gift, grant, bequest, devise, lease or otherwise, the development rights, conservation easements, restrictive covenants, fees or other contractual rights to lands within such municipality.* Under the law, individual property owners can donate an easement on their lands to their local municipality for which a reduction in property taxes would be awarded. The Federal Income Tax Law places certain requirements on the donation of these rights. They must be donated permanently and preservation of the land must serve a public purpose, such as protecting wildlife or its scenic value. This donation can provide significant tax advantages to individual landowners and can be an important instrument for land preservation for a municipality. Local preservation programs have recently been expanded within the Town of Islip and East Hampton and other Suffolk towns to encourage the acquisition of easements. In addition, the Nature Conservancy, a non-profit conservation group, has made such agreements particularly with landowners whose property is adjacent to the organization's preserve on Long Island.

Local municipalities through Suffolk are strongly encouraged to make use of these specific types of agreements especially now, at a time when public funds for buying open space and sensitive environmental areas are at a minimum. Special attention should be directed toward sites where existing development and/or private interest are held within or near environmentally critical areas of fresh surface waters (inland lakes, ponds, streams) and freshwater wetlands where protection is currently inadequate at the Federal, State and County levels.

***Conservation Easements***

As previously pointed out, Article 247 of the General Municipal Law of the State of New York enables local governments to preserve open space and agricultural lands through designation of easements. The use of conservation easements by the towns can provide permanent protection of lands which are of scenic or ecological value, including areas adjacent to fresh surface waters.

In January 1982, the Suffolk County Planning Commission's staff completed a paper entitled *Management of Perpetual Conservation Easements.* The paper may be used as a guide for municipalities in the development of management criteria for conservation easements. Although areas have been designated as open space or conservation easements, they may still experience a variety of impacts. Proper management will minimize or mitigate the amount and type of impacts permitted to occur in these areas. Management guidelines suggest the development of a detailed management plan for the site which should include the following:

- Identification of activities which can result in an impact
- Identification of measures to prevent impacts
- Identification of an existing group or a municipality to be responsible for the management of the conservation easement. The group should then select a person to be responsible for implementing the plan.

The following activities should be prohibited within conservation easements in order to provide proper management of the site:

- Directing stormwater to the area
- Illegal tree cutting
- Site clearing and grading
- Removal of vegetation except for diseased plants
- Other activities which are inconsistent with the normal or unusual maintenance of the site.

**5. Town Programs**

Recent development pressures have caused most Suffolk County towns to become active in open space preservation. Many towns have been using clustering to preserve open space and minimize the environmental impacts of subdivisions. Five towns have made significant zoning changes or are in the process of doing so.

The Towns of East Hampton, Islip, Shelter Island and Southampton have recently updated master plans. The Towns of Brookhaven, Huntington, Riverhead, Smithtown and Southold are all in the process of updating their master plans.

There are currently ten bills before New York State Legislature which, if passed, would allow towns to impose a land transfer tax of 2% on the transfer of real property, with some exclusions. The funds would then be used to purchase open space. If passed by the state local referendums would have to be passed in each town to institute a land transfer tax.

***Town of Brookhaven***

The Town of Brookhaven has made extensive use of clustering to preserve open space. The master plan is in the final adoption stages. A proposal calls for upzoning 95,000 acres to at least one acre minimum lot sizes.

West Meadow Beach leases on land occupied by 101 cottages expired on January 1, 1986. The town is currently in litigation over its efforts to remove all but the Gamecock Cottage and reclaim the area as valuable open space.

***Town of East Hampton***

The Town of East Hampton has recently upzoned some areas. They are also pushing for the 2% real estate tax to be used for acquiring open space.

***Town of Huntington***

Two farms in West Hills, Froehlich and Wicks, facing subdivision are under consideration for acquisition. If funds are not available the town might consider the Froehlich developers offer to donate 117 acres out of the 208 acre total.

***Town of Islip***

Islip has a regional park under construction on 97 acres in Holbrook. Included in the park will be baseball and soccer fields, tennis courts, swimming pool, a small golf course and a large preserved area with nature trails.

The town is proposing to acquire 4 acres on Orowoc Creek.

***Town of Southampton***

Southampton has allocated $8 million to acquire 535 acres of environmentally sensitive land. There are about 100 parcels in the program and appraisals are in the process of being completed. About half of the funds would be spent on acquiring land for the Long Pond Greenbelt. The town has secured 9 acres Towd Point in North Sea. Southampton is proposing a public park and sports complex on 40 acres donated by the Red Creek Ridge development.

**RECOMMENDATIONS**

Considering development pressures, local opposition to development and the possibility of funding from a 1/4 cent sales tax, now is the time to institute a comprehensive open space plan. Coordination is needed between the 1/4 cent sales tax program, the $60 million County Open Space Program, the New York State Environmental Quality Bond Act, the Suffolk County Water Authority's Acquisition Program and other programs being instituted at the town or village levels. Cooperation among two or more levels of government has already been used in acquisitions such as Hither Woods and the Long Pond Greenbelt. Criteria for acquisition should be laid out to guide what land is to be acquired. Since the monies available would still be insufficient to purchase every piece of open space, priorities need to be established to make the most efficient use of limited funds.

Cost-benefits of society of open space acquisition are difficult to estimate. When open space lands are developed, the need for public services increases (such as police and fire protection, road and drainage, sewage treatment, etc.). Polluted groundwater resulting from developed areas may have to be treated or water may have to be imported from another region. The acquisition of open space lands can also result in the price appreciation of adjacent and nearby properties and thus add to tax revenues.

**1. Clustering**

A very important means of open space acquisition by the towns has been through the use of clustering. Clustered development, combined with the dedication of conservation easements, can protect the environment while increasing the tax base. In recent years, the Towns of Islip, Smithtown and Huntington have obtained over 1,000 acres of public parklands through clustering or density modification. Brookhaven and the eastern towns have acquired even more. In addition, other cluster developments have preserved land for homeowner associations and other private groups. Since there are limits to public acquisition funds, this method of preserving open space will be even more important in the future. New York State legislation enables municipalities to enact mandatory clustering. Several towns have mandatory clustering ordinances; these should be required wherever environmentally sensitive lands are involved. Cluster plans should coordinate with adjacent parcels and open spaces to maximize the benefits of clustering.

**2. Conservation Easements**

Local municipalities should require the dedication or outright transfer of conservation easements for conventional or clustered subdivision in an effort to protect environmentally sensitive areas including: freshwater wetlands, land adjacent to surface water, deep recharge areas and sites containing unique and animal species.

Various preliminary steps should be taken prior to the actual dedication or transfer of the conservation easement, as outlined below:

- *Delineate conservation easements or subdivision maps and other site plans.*
- *Develop management controls.*
- *Select the municipality or group in charge of management of the easement.*
- *Submit plans for municipality review.*
- *Determine the dedication or transfer process.*

The dedication or transfer process should be detailed enough to avoid any margins for error within the system and also simplified enough to be attractive to prospective donors. The following process may be used as a guide for towns and municipalities.

- *Require proof of transfer of title to Suffolk County, Nature Conservancy or other organization prior to or in conjunction with the filing of a subdivision map or site plan.*
- *File duplicate maps along with a declaration or covenants and restrictions to the County Clerk and the Building Inspection so that in the future, if the property is contested, the information will be readily accessible.*
- *A performance bond should be required of all developers to insure that legal deed is submitted to the municipality. The developer should not be released from the bond until the land has been properly transferred and evidence is submitted that all taxes have been paid and are up-to-date.*
- *Deeds should identify future owners and future site restrictions.*
- *The town assessor's office should be notified so that the proper adjustments in taxes can be made. If the property is deeded to a municipality, it should be taken off the tax rolls. In a case where a homeowner's association has received the easement, each lot owner should be individually assessed for his or her share of the conservation area.*
- *Taxes for easement areas should be based on the open space value rather than the development value.*
- *If the easement is deeded to a homeowner's group, the Nature Conservancy or other private group, the municipality should require that the deed be perpetual.*
- *If the homeowner's group should disband, the deed should be transferred automatically to the municipality.*

### 3. County-owned Properties Recommended for Nature Preserve Designation

In an effort to acquire environmentally sensitive lands, wetlands and watercourse, areas of important groundwater recharge and significant natural vegetation and wildlife habitats, the County is actively reviewing tax lien properties for acquisition. If these properties lie within certain designated areas which are considered environmentally significant or sensitive, the Planning Department is recommending that they be retained by Suffolk County in their natural state and designated to the Suffolk County Nature Preserve as forever wild pursuant to Article I, Section 110 of the Suffolk County Charter. Identification and review of these properties are presently being initiated through the coordinated efforts of the Planning Department and the Department of Real Estate.

Sensitive or significant areas include:

*Tidal Wetlands*
*Lands adjacent to wetlands and surface waters*
*Lands contiguous to County-owned tidal wetlands*
*Underwater lands*
*Oyster lots*
*Pine Barrens areas*

Freshwater wetlands should also be transferred to the Forever Wild Category subject to Article I of the Suffolk County Charter.

# SOLID WASTE

## INTRODUCTION

Suffolk County's solid waste problem continues to intensify, as tonnage per day increases and solutions all too frequently remain moored in necessary, but hardly speedy, phases of planning, feasibility study and economic analysis. Meanwhile, the deadline of January 1, 1991 (when, according to Title 7 of the New York State Environmental Conservation Law, most existing landfills must close) draws inexorably nearer. The rationale for Title 7 is to protect the groundwater which is the sole source of the Island's water supply. Thus, for towns whose landfills are geologically proximate to aquifer recharge areas, the landfill closure deadline poses a particularly acute problem. The towns, under varying degrees of pressure from New York State Department of Environmental Conservation to meet the 1990 deadline, are actively looking into alternatives to landfills and in some instances committed to constructing mass-burn solid waste resource recovery and disposal facilities. A heightened interest in recycling accompanies solid waste planning in virtually every town.

## UPDATE OF EXISTING SOLID WASTE SITUATION IN SUFFOLK COUNTY

### 1. Town of Babylon

With a population of 209,380, Babylon produces roughly a quarter million tons of municipal solid waste annually (see Table 37). The current destination for this waste is the town landfill in Wyandanch which operates under a consent order and is expected to reach capacity within two years or by 1990.

**TABLE 37**

**Annual Per Capita Production of Municipal Solid Waste, By Township**

| Town | TPY * (Tons/Yr.) | POP ** (Population) | Per Capita Per Year (Tons) | Per Capita Per Year (Lbs.) |
|---|---|---|---|---|
| Babylon | 220,000 | 209,380 | 1.05 | 2100 |
| Brookhaven | 425,000 | 405,844 | 1.05 | 2100 |
| E. Hampton | 25,000 | 15,902 | 1.57 | 3140 |
| Huntington | 260,000 | 204,173 | 1.27 | 2540 |
| Islip | 270,000 | 304,868 | .89 | 1780 |
| Riverhead | 40,000 | 22,199 | 1.80 | 3600 |
| Shelter Is. | 3,500 | 2,403 | 1.46 | 2920 |
| Smithtown | 160,000 | 120,113 | 1.33 | 2660 |
| Southampton | 70,000 | 49,049 | 1.43 | 2860 |
| Southold | 30,000 | 21,003 | 1.43 | 2860 |

* NYSDEC *Solid Waste Management Plan*, March 31, 1987
** LILCO estimates, January 1987

This chart represents an attempt to provide an additional perspective on the municipal solid waste situation by establishing rough per capita statistics for MSW generation within each township, based on LILCO population estimates and reported tonnage of MSW generated by each town. Unrefined or even flawed as these figures may be (they do not, for example, take into account expanded summer populations in East End towns nor the particular impact of construction and demolition debris due to homebuilding or second homebuilding) they may provide a basis for further refinement, analysis and questions and a basis for future comparisons.

Under development at a cost in excess of $100 million is a waste-to-energy incineration plant (or, resource recovery facility [RRF]) projected to accommodate 750 tons per day. Assuming the town's generation of solid waste remains constant at about 600 tpd, this planned facility should adequately process municipal waste into the foreseeable future (25 years is the usual life expectancy of such plants). Babylon has chosen Ogden Martin Systems, Inc. to build and operate the RRF facility, and the construction process is underway at a site adjacent to the town landfill. Babylon is the second town in Suffolk County to move to resource recovery to deal with its garbage crisis.

Babylon proposes to dispose of its ash at the present landfill site, and in conjunction with the planned resource recovery plant, the town will construct an adjacent 4.2 acre ash monofill. The monofill is not expected to be completed until after the resource recovery facility is on line. All governmental regulations related to both the plant and monofill will be met.

Related to the construction of the resource recovery plant are some important decisions that were made which should set an example for other projects of this type. Agreement was reached to include state-of-the-art baghouse-scrubber technology to the plant. A fabric antipollution device called a **baghouse** will cut emissions of particles from the facility's smokestacks to about half of what the state standards currently allow.

The town also projects development of an ambitious recycling program aimed at recycling 15% of the town's garbage by 1989.

*RECYCLING PROJECTS.* A law currently on Babylon's books requires separation of the following: paper, glass, metals, concrete, and compost materials. Of the Long Island townships, only Babylon has reached formal accord with the DEC to recycle a specific volume of waste (15%). This commitment is impressively in excess of the town's current level of recycled waste materials (an estimated 4%) and, if it can be met, about 33,000 tons of waste annually will be recycled.

Babylon contracted with *Babylon Source Separation, Inc.* (BSSI), a consortium of local carters, to implement its mandated recycling pledge. As part of the new plan, waste disposal fees will be integrated into the town property tax structure to provide an incentive for participation in the plan and a disincentive for nonparticipation by private haulers.

Garbage trucks of a specialized functional design will be used; these have two separate compartments for recyclables (one for newspapers, one for beverage containers). Under a later phase of the plan, residents receive plastic recycling containers for bottles and cans.

### 2. Town of Brookhaven

Brookhaven's 405,844 residents produce about 425,000 tons of municipal solid waste annually. This waste stream currently ends at the town's Horseblock Road landfill. Four methane-powered electrical generators draw methane from one part of the landfill. The current working area of the Horseblock Road landfill is double-lined and has some capacity left and arguably could accommodate the town's needs beyond 1990, when, under state law, Brookhaven must discontinue landfilling unprocessed waste materials.

The Brookhaven landfill receives about 1200 tpd of municipal solid waste. Groundwater contamination in an associated plume from that landfill has been confirmed. To conserve space at the 280 acre landfill facility and reduce the influx of out-of-town garbage the town bans all construction and debris (C&D) material.

Old landfill sites are used by the town for related purposes. The Manorville facility now serves as a permitted transfer station and is, in addition, used for brush burning and recycling. The Pine Road facility serves as a composting site. At the Holtsville facility, a methane-powered electrical generator operates, and the town plans to install new wells at the perimeter of this site to test for possible methane leaks.

Brookhaven has a Department of Waste Management, which combines all functions related to waste management and disposal including roadside cleanup and waste control enforcement. The department is now addressing a number of issues, including the formation of garbage districts, the need for a recycling processing center, and increased enforcement at the landfill site.

Reportedly, Brookhaven Town will rely on a forthcoming solid waste management plan to explain the actions to be taken to fulfill the requirements of the state's landfill law (3/88). Currently, the town doesn't have a SWM plan, purportedly because the *Generic Environmental Impact Statement* (GEIS) on solid waste is yet to be completed (Dvirka and Bartilucci are the consultants hired by the town). The GEIS will survey all options and accompanying technology and overview the existing solid waste situation in the town. Based on these elements, the firm will make final recommendations about how best to proceed given the existing situation. The GEIS document is also a requirement as part of the State Environmental Quality Review Act (SEQRA) if a *Resource Recovery Facility* (RRF) is being proposed for construction, and included in the town's solid waste management plans. It has been reported that the town is considering constructing a resource recovery facility on land owned by the federal government (Brookhaven National Laboratory) and assessment of this site may possibly be included in the solid waste management plan when it is eventually released. Meetings between the DEC and town officials are in the works to review aspects of the proposed GEIS before approval (by the DEC) is forthcoming. Presumably, the acceptance of a final GEIS will follow with a release of the solid waste management plan to outline how Brookhaven will approach disposal of its municipal solid waste stream in the coming years, particularly after 1990.

*RECYCLING*. Despite the evident lack of support for a short-lived volunteer newspaper recycling project initiated several years ago in Mastic-Shirley, Brookhaven primarily relies on the success of volunteer efforts.

At several sites within the township, metals, glass, paper and used motor oil are collected and, again, a pilot recycling program is envisioned for the Mastic-Shirley area. A recycling coordinator is working to develop more comprehensive townwide programs. Currently, less than 5% of the waste stream is recycled (and one published report estimates the figure is only 1%).

### 3. Town of East Hampton

Twenty-five thousand tons of municipal solid waste are produced annually in East Hampton by a population which varies from a stable year round 15,902 to a considerably higher number in summer.

Two-thirds of the town's waste stream ends in the Fireplace Road landfill, which operates despite the lack of a permit or a consent order. (The town's other landfill, in Montauk, does not have a permit or a consent order either and may have to close because of state law permit deficiencies.) Both landfills lack groundwater monitoring wells and vents to prevent methane gas buildup.

According to current projections, there might be some space left in the Fireplace Road landfill in 1990, but alternatives to the landfill are mandated by state law. East Hampton's plans for meeting the 1990 deadline have not been finalized.

*RECYCLING*. In this public spirited, relatively affluent community, citizen support for recycling projects has not been lacking. A private contractor handling voluntarily recycled materials cancelled its agreement with the town at the end of 1985 only because markets for the collected materials seemed insufficiently identified at that time.

In 1987 voluntary recycling was once again initiated, under a pilot project developed for the town by Barry Commoner's Center for the Biology of Natural Systems at Queens College. Reportedly more residents called to volunteer for the 10 week pilot project than the program had been designed to accommodate, and, as the project neared its close, residents petitioned to continue it.

Those participating separated refuse in their homes into four different containers: for food garbage; clean paper and cardboard; glass bottles and metal cans; and plastics and other nonbiodegradable items. All collected materials were then taken to the landfill, where the papers, cardboard, glass and cans were recycled and the food garbage composted. Only the plastics and other nonbiodegradables were landfilled.

East Hampton's outlook for the future of recycling is particularly sanguine: according to one report, town officials believe that recycling of more than 70 percent of household refuse can be accomplished. In the near future, composting materials including heavy brush and land-clearing debris are to be separated from other municipal waste. According to current reports, East Hampton now recycles about 10% of its municipal waste.

### 4. Town of Huntington

Huntington's 204,273 residents generate 260,000 tons of solid waste per year, most of which (approx. 80%) reaches the town's only active landfill, located in East Northport, which operates under a consent order but is near or at capacity. It is supplemented only by outmoded incinerators, which accommodate the remaining 20% of the town's MSW but do not produce recoverable energy.

A 750 tpd RRF has been proposed but will not be operational until 1990. If completed, as expected, in 1990, the proposed RRF should be adequate to process the town's municipal waste. Right now, however, Huntington faces a situation of rapidly decreasing landfill space, along with possible shutdown of the old incinerators due to water pollution. These concurrent problems could make long-haul trucking of municipal waste off-island an inescapable spectre of the immediate future, at least until the RRF is operational, at an estimated cost of $3 million per month.

A joint municipal waste disposal plan with Smithtown, proposed in early 1988, could offer an alternative to off-island trucking. According to the plan, Huntington would take its MSW to the Smithtown landfill until 1990, and Smithtown would be allowed to burn its trash in Huntington's RRF after that date.

Meanwhile, the town is preparing for the possible need to export garbage. A transfer station adequate to the estimated three-year period of exportation will be built in conjunction with the RRF. Since the *preferred site* for the RRF is East Northport, which is also the site of the current incinerators, the long-hauling of garbage would intensify when these are demolished to make way for the new RRF.

Residual ash and by-pass waste from the RRF must eventually be landfilled or otherwise disposed of, however--and to date plans for ash residue and by-pass waste disposal have not been finalized. Ash disposal and by-pass are flux areas.

An EIS for the town's Resource Recovery Project was prepared by the engineering consultants, Dvirka and Bartilucci, (according to which the) Resource Recovery Project will involve the disposal of the town's MSW

> ...through the mandatory source separation and recycling of materials for reuse, interim long-haul and through volume reduction of the remaining refuse at a 750 tpd waste-to-energy facility which would provide for the recovery of useful energy.

In 1987, the post of Director of Solid Waste Management was created as an integral part of the town's Department of Environmental Control. This position carries responsibility for overseeing the trucking operation, the recycling program and overall waste stream control and compliance.

Reportedly, a landfill review by DEC (which includes hearings) is in progress which could result in the closing of the landfill because of alleged violations of operational criteria (such as piling refuse too steeply and failure to properly cover raw garbage). The DEC also alleges that the landfill is full. The results of these latest hearings will probably significantly determine which direction the town will take regarding solid waste disposal (3/88).

*RECYCLING.* A serious trash separation and recycling program was instituted in July 1987, requiring businesses in the town's two municipal sanitation districts to separate cardboard from other refuse and requiring homeowners to separate newspapers from other household waste. Penalties exist for failure to comply. Prior to the institution of this program, Huntington's recycling rate was minimal (less than 1%) and relied on residents voluntarily taking separated paper, glass, metals and used motor oil to selected sites. It is expected that the mandatory program begun last summer will improve that figure, and that a 15% reduction of the waste stream (through the mandatory source separation and recycling envisioned by the Dvirka and Bartilucci EIS) can be accomplished.

**5. Town of Islip**

In Islip, 270,000 tons of municipal solid waste is annually generated by a population of 304,868 persons. This means that, by a considerable margin, Islip has the lowest per capita generation of municipal solid waste of all Suffolk townships (see Table 37).

Beginning in 1986, Islip differentiated its treatment of commercial and residential refuse, shipping the former off-island for disposal (at a cost of about $86 per ton). But the vessels carrying this waste were not always welcome, resulting in an extended landfill-use agreement with the DEC in 1987 relating to the Blydenburgh Road landfill in Hauppauge, which is full. As a result of the compromise reached with the DEC, Islip may not expand the landfill but may regrade slopes at the 84 acre site to accommodate the town's MSW (commercial and residential) until 1990. Islip has agreed to return the site to a clean, pre-landfill condition sometime after 1990 and accept a strict DEC monitoring program.

Looking toward 1990, Islip is building a 500 tpd waste-to-energy incineration plant (RRF). (Islip was in fact the first Suffolk municipality to begin a resource recovery facility; construction was begun on a 16 acre site near MacArthur Airport in December 1985.) This is the first of a new generation of RRFs that are proposed for the region and reportedly the fourth of its type to be built in the U.S. Separate operational systems convert the waste, first, to gas (through a combustion process) to finally to electricity. The gas enters a boiler and steam is produced. Then, it is heated to approx. 700 degrees F. and processed through a turbine generator to produce electricity. About 30% of the electricity generated is used to run the plant, with 70% going to LILCO. Ash resulting from the process drops through grates into holding tanks.

Its financing was aided by $7.5 million from Environmental Quality Bond Act of 1972 funds granted to the project. (The private firm building the plant is to provide an equal amount to the plant in the form of equity.)

The plant is now 95% complete (3/88). Final construction phases, however, are subject to some delay, reportedly due to financial difficulties experienced by the chairman of Pennsylvania Engineering Corp., the plant's contractor. Islip officials say however that work is proceeding on the plant, even though it's behind schedule, and estimate that it may go on line about a month late (3/88).

The town also operates a C&D site at Sayville.

*RECYCLING.* A goal of recycling 50% of Islip's MSW by 1990 was set as part of the town's landfill agreement with the DEC.

Islip led other towns in its recycling efforts, begun five years ago. Islip continues its active recycling program which recovers up to 300 tons of material weekly, thereby reducing pressure on the landfill and earning income for the town. In this source separation venture, saleable items are retrieved from a pre-separated garbage stream. This is one of the most innovative source separation projects operating anywhere in the country.

Under the program, the town's residents are required to separate newspapers, cardboard, cans and bottles for separate pickup. There are no penalties for noncompliance at present, but in mid-1987 Islip officials inaugurated a public relations campaign aimed at improving the present compliance rate, estimated at 20%.

In addition, the town plans to facilitate both citizen compliance and efficient handling of the collected materials by providing homeowners with three different garbage cans and purchasing new trash collection vehicles with three separate compartments. Incentives for compliance and penalties for noncompliance are also being considered.

Restrictions exist for transfer stations which serve the recycling program: the transfer stations must be built on at least two acres and must be 200 feet from any residential property. Sorting and processing of recyclables must be done indoors.

Commercial recycling enterprises are to be located in areas zoned for industrial use. But smaller recyclers, for instance carters who do their own separating and recycling, may apply for a variance through the town planning board.

Even though, by current estimates, Islip recycles less than 5% of its municipal solid waste, if the removal of organic wastes for composting is taken into account, this figure rises to approximately 10%. Islip has obtained a DEC permit to operate a 39 acre composting facility near MacArthur Airport for five years.

**6. Town of Riverhead**

The 22,199 residents of the Town of Riverhead produce 40,000 tons of municipal solid waste each year, virtually all of which is disposed of at the town's municipal landfill.

The landfill's groundwater system is monitored by the county and has a methane-powered electrical generator. There is a permitted sand mining operation adjacent to the site, and the town is using the clean fill for daily cover of the landfill. The town has proposed lining the mined sand pit and using it for C&D disposal. However, the site is located over a designated deep water recharge zone.

Town officials recognize that the landfill must be closed by 1990, but so far have not definitely identified an alternative to its use. Discussion with Southampton Town of a joint energy-producing incineration facility is ongoing, and at one point five possible sites for a jointly-used plant were reportedly selected by a bi-town advisory committee but, again, nothing is definite.

*RECYCLING.* For years, the town has provided separate dropoff points at its landfill where Riverhead Town residents may dispose of metal, glass or paper, but the present effect of this voluntary recycling effort on Riverhead's solid waste stream is minimal. The town has considered instituting mandatory recycling programs and/or strengthening current levels of voluntary recycling via organized programs, but some officials feel that viable markets for the collected materials should first be identified.

### 7. Town of Shelter Island

Shelter Island has the lowest population of any of the Suffolk County townships – 2,403 – and also the lowest amount of municipal solid waste generated – approximately 3,500 tons annually. The town operates a municipal solid waste landfill at Menantic Road. The site occupies 25 acres and is unlined. Despite the adequacy of the Shelter Island landfill to contain this volume of waste in the foreseeable future, landfill use must cease by 1990 if the town is to comply with the deadline under state law. Some officials hope, however, that the Shelter Island landfill may be allowed to operate beyond 1990, given the relatively modest waste stream it must accommodate and its distance from sensitive underground water supplies.

However, the town is beginning serious study of alternatives. While no real progress toward implementation of resource recovery has been made at this point, town officials have attended presentations of the *Eweson Digestor Compost System* (2/86). A joint effort (with Southold Town) to build an alternative facility is being explored but many feasibility issues, including economic ones, remain to be determined. And in March 1988 user fees for the landfill were proposed for dumping of non-household wastes, including trees and brush cleared from construction sites. Again, however, economic and other implications of user fees are being carefully assessed. Some concern over the cost of overseeing and enforcing collection of user fees has been voiced. Another potential problem is that Shelter Island residents, confronted with a landfill-use fee, would resort to illegal dumping. Nonetheless, the Town Attorney will look into amending the Town Code with regard to user fees while the Town Board will seek to develop a comprehensive policy with respect to the same.

*RECYCLING.* In 1984, recycling proposals to reduce the MSW volume buried at the landfill were reviewed. A voluntary program began in early 1987 for newspapers only, and about 30 tons were reportedly collected by the end of the year. Expanding the program to include other materials is being considered, and some officials believe it is realistic to expect that, with expansion of the relatively new program, 15% of Shelter Island's municipal waste can be recycled.

### 8. Town of Smithtown

Smithtown's 120,113 residents are responsible for the generation of approximately 160,000 tons of municipal solid waste per year. Almost all of this is disposed of at the town's only operational landfill, a 25 acre site which has a double liner and a leachate collection system as well as a methane collection and monitoring system which may eventually be used to run a methane-powered electrical generator.

The town's Kings Park landfill is closed and inactive, but has a methane-powered electrical generator to produce electricity and relieve the site of methane buildup. The Kings Park C&D site on the former unlined landfill accepts only C&D materials. It is unlined. The Middle Country Road landfill is also closed and has an active methane venting system. Highway Department buildings on this site have methane alarms and active venting around the foundations closest to the landfill area. The Montclair Avenue landfill and C&D site is closed and inactive with a passive methane venting system.

Smithtown's only active landfill has been operating, despite vigorous criticism by the DEC, without either a permit or a consent order, but in March 1988 the State Conservation Commissioner ordered that Smithtown receive the necessary permits to operate a portion of its landfill.

Facing the 1990 landfill closure deadline, Smithtown officials are exploring a range of options including incineration, intensification of current recycling efforts, and a waste-to-energy facility jointly operated with other nearby townships.

Under a plan proposed in early 1988, Smithtown's landfill, which is not yet at capacity, would accept Huntington's MSW until 1990, at which time Smithtown would begin transporting its solid waste to Huntington's new Resource Recovery Facility (RRF), projected to be operational by that time.

*RECYCLING.* In Early 1987, Smithtown began a pilot recycling project mandating the separation of newspapers, cardboard, glass and metal from other residential waste. The project initially involved 2,000 homes and has now been expanded. The town's recycling coordinator reports the program, a comprehensive one that involves not only sorting and pickup but also selling the collected materials, is proceeding well, with *excellent* cooperation from residents. Somewhat unique awards for compliance, given to all members of one winning household per week, will include specially designed T-shirts (compliments of the town) and dinner for two for each winning family member at local restaurants (courtesy of radio station WGSM). Winning households are to be selected by town staff members who will examine recycling pails at random (3/88).

### 9. Town of Southampton

Southampton's population of 49,049 produces 70,000 tons of municipal solid waste annually, for which the only real outlet is the town's North Sea landfill, now described as facing a *crisis* situation. Not only has the site reportedly reached capacity, but the DEC contends that clay liners, purportedly installed in the early 1980's were either improperly installed or may not have been put in place at all. The DEC has threatened court action to close the landfill for this reason. Having no alternative to the landfill at present, the town says it will *fight* to keep the landfill operating rather than face the exorbitant costs of shipping waste off-island.

The town in 1986 began seeking permission from the DEC to open a new cell at the North Sea landfill. If the DEC grants permission for the new cell, it will be double-lined.

A complicating factor in Southampton's solid waste stream, an unusual volume of construction debris due to second-homebuilding, was dealt with in 1986 when the town banned dumping of all C&D materials. The town has also instituted user fees for the landfill, including fees for residents who bring their refuse directly to one of the transfer stations.

*RECYCLING.* Currently, Southampton Town officials are demonstrating a real commitment to recycling, and high priority is being given to maximizing the impact of recycling programs. In 1987, Southampton put in place separate trash containers, on loan from several carting companies,

*for collection of newspapers and cardboard at the town's three transfer stations. In March 1988, the town voted to spend $42,000 to purchase 16 large roll-off* containers for the collection of recyclables. The town will probably expand the separated materials to include glass and metal and is reportedly also giving serious consideration to making the current voluntary program mandatory. Also under discussion are reduced fees to commercial carters as an incentive for them to separate newspapers, glass, and perhaps other recyclables from the materials they collect. Innovative recycling modes are being actively sought by town leaders, and, according to one report, a goal of removing at least 15% of solid waste from the waste stream through recycling has been set.

**10. Town of Southold**

Southold's 21,003 residents generate approximately 30,000 tons of municipal solid waste each year. Reportedly 80% of this waste is landfilled, the great majority (approx. three-fourths) at a site in Cutchogue which operates under a consent order. There is also a smaller landfill site on Fishers Island, which does not have a consent order. The adequacy of these landfill sites to accommodate Southold's current and projected needs becomes a moot point given the 1990 landfill closure deadline set by state law. However, Southold has operated a permitted sand mine adjacent to the Cutchogue landfill with the anticipation of landfilling in that excavated area in the future, if DEC approval can be obtained. Southold is considering a joint waste treatment facility with Shelter Island and also seeks to maximize composting and recycling efforts.

*RECYCLING.* On a voluntary basis, Southold residents separate newspapers and metals for recycling and brush and leaves for composting. Reportedly, 20% of the town's solid waste is recycled and officials hope to raise that figure to 30%. There are also plans to expand the voluntary recycling program to include plastics and glass.

**TRENDS**

***The Current Picture***

More than 90% of America's municipal solid waste is simply buried in the ground, according to the report in the Dec. 1987 issue of *Governing*. As we have seen, this overall statistic holds true throughout Suffolk townships. This figure will stubbornly resist significant change in the absence of incineration technologies, since (according to the same report) recycling *cannot be counted on to reduce the volume of trash by more than 25 percent.* Long Island municipalities, faced with mandated landfill closures within just a few years, must therefore project their anticipated success at recycling and consider advanced resource recovery (incineration) facilities or garbage exportation to deal with the remainder of their solid waste stream.

A critical problem facing the Towns of Huntington, Islip and Babylon is a severe reduction in existing landfill capacity. Even before New York State mandated landfill closure after 1990, these towns were pressed for space at their existing landfills. These three towns are all moving to resource recovery plants complemented with some recycling but are unsure whether the operating incinerators will be in place before land burial capacity is reached.

***Attempts to Alter Landfill Dominance in MSW Disposal***

THE ROLE OF RECYCLING

With the exception of certain highly motivated communities which may be anomalous, mandatory programs seem to hold more promise for success than voluntary ones. And, since even mandatory programs pose enforcement problems, enthusiasm for volunteer efforts is important and should be courted with effectively designed and implemented public relations programs.

*Recycling* is a general term which usually involves closely related concepts of waste reduction and source separation. Where the former is concerned, an incipient effort is being made, by at least a few towns, to address the problem of overpackaging and to build consumer awareness of, and ultimate avoidance of, overpackaged products.

(Note: The packaging industry is not totally unaware of the problem, and several industry initiatives for the control and recycling of packaging materials do exist. Certain plastics manufacturers have formed the *Council of Plastics and Packaging in the Environment* (COPPE) to promote degradable packaging, and the recently merged Institute of Scrap Recycling Industries and the National Association of Recycling Industries has reportedly created a program called *Design for Recycling* to urge manufacturers to include the recycling potential of products as a factor in product decision-making (10/87).)

Also related to recycling is the concept of source separation, defined by the DEC as the segregation of recyclable materials from the solid waste stream at the point of generation (i.e. home or office) for separate collection or delivery to a recycling center and subsequent processing or preparation for recycling. The Town of Islip's recycling program would, as one example, fit the above definition. Virtually every township in Suffolk County, however, either now has a recycling program in operation or has plans to begin one in the near future.

EXPORTATION OF GARBAGE

The shipping of garbage off Long Island must be counted as a trend in MSW disposal, though it is not one anybody likes very much. The costs to a township can reach millions of dollars per month. Another demonstrable peril is that agreements with municipalities (or private companies) at points of destination for the trash may turn out to be less than reliable: this was the case in 1987 with a barge carrying solid waste from the Town of Islip.

MASS-BURN WASTE-TO-ENERGY INCINERATION FACILITIES (RRF's)

In the years beyond 1990, it seems clear that Long Island's reliance on landfilling as a primary means of MSW disposal will be superseded by reliance on resource recovery incineration facilities. These aptly-named *mass-burn* plants, based on a technology imported from Europe, neatly sidestep the problem of the vulnerability of L.I. groundwater supplies to possible contamination from landfill leachate. However, the mass-burn plants pose a few problems of their own: if concerns for groundwater purity mandated the landfill closings of the present time, worry over air quality may similarly dictate abandonment of the RRF in the future. However, that possibility does lie in the future. For at least the short term, commitment of Long Island, and specifically Suffolk's townships to the new RRF's is established, in many cases contractually, so the concommitant problems of these facilities bear some examination.

ASH VITRIFICATION

It is contended by some that ash residue from RRF's may be successfully *vitrified* to create frit, a glass-like material approximately three times the density of the original ash, that may be an economical component of asphalt. Another end-product of ash is a metal ingot nearly ten times denser than the original residue. The ingots are **not hazardous** according to a subcommittee of the American Society of Mechanical Engineers (*Solid Waste & Power*, 10/87) and can be used in manhole covers, expansion joints and similar products with municipal applications.

## PROBLEM AREAS

### *Reduced Landfill Capacity*

Nationwide, more than 3,500 landfills have closed since 1979. The reason alternatives to landfilling must be found on Long Island is the vulnerability of the region's sole source aquifer from which all of the Island's water supply is drawn. The need for strict regulation is imperative; hence, the NYS law mandating closure of most Nassau and Suffolk landfills after 1990. DEC Commissioner Thomas Jorling has indicated in *Empire State Report* that *I think those deadlines are very firm.* (2/88)

A critical problem facing the Towns of Huntington, Islip and Babylon is a severe reduction in existing landfill capacity. Even before New York State mandated landfill closure after 1990, these towns were pressed for space at their existing landfills. These three towns are all moving to resource recovery facilities (RRF's) complemented with some recycling but are unsure whether the operating incinerators will be in place before land burial capacity is reached.

### *Managing RRF's*

Incineration plants that convert waste to electricity are no longer viewed as simply a means of cutting energy costs; instead, they have been called the *front line of defense against growing mountains of trash* (Business Week, 5/87). The article said the volume of raw garbage can be reduced by approximately 90 percent (leaving 6 to 10 percent as ash). What was not mentioned is the up to 33 percent ash residue produced by some plants. Nationwide, since 1972, about 100 of the new RRF's have become operational or are nearing completion. (Although, differences between 1970's and 1980's RRF state-of-the-art should be noted.)

As was the case with many early incineration plants, the current cohort of mass-burn resource recovery facilities is based on technologies first developed in Europe. However, effective MSW disposal by incineration is generally acknowledged to be a more difficult problem here than in Europe due to the complexity of our trash. Plastics, for example, pose special incineration problems, including the potential for the formation of corrosive gases. But according to trade publications, newer plants are protected with corrosion-resistant ceramics; redesigned grate systems promote more complete combustion; and progress has been made in reducing air pollution -- e.g. scrubbers are employed to eliminate gases such as hydrogen chloride. (An associate editor of McGraw-Hill, Inc.'s *Waste to Energy Report* has even asserted that the newest RRF's can be considered *aesthetic.*)

It is nonetheless obvious that segregation of components of MSW in households and at collection sites would make both recycling and incineration easier. The Center for the Biology of Natural Systems at Queens College has questioned the use of mass-burn plants without at least some separation of materials (particularly paper from plastics).

Two major factors which come up concerning mass-burn incinerators are: *What are the air quality parameters?* and *Will alleged toxins in the ash affect the groundwater?* An event which may set an example for air quality parameters is the decision by the Town of Babylon to include a baghouse-scrubber (fabric) technology device on their planned RRF to further protect the air from possible harmful emissions (emissions will be held to 50% below what NYS requires). This action plus the agreement to recycle a portion of the town's waste stream are events which indicate that a town can custom design a suitable project to accommodate its MSW stream while obviating or minimizing the appearance of problems concommitant to the new technology.

It remains nonetheless true that total solutions to the air pollution and ash disposal problems that result from RRF operation are not completely solved. *Science* magazine (6/87) recommends that, with regard to RRF operation,

> *Before new air pollution problems are created, lessons should be learned from other developed countries that have in place standards, monitoring and trained engineers in operating the plants.*

### *Ashfill*

The State Legislature created the 13-member Long Island Regional Ashfill Board (1985) to study and hold public hearings which would lead ultimately to the selection of a single, regional ashfill site. The need for such a site or sites became apparent when resource-recovery mass-burn incinerators appeared as the logical alternative to landfilling in Suffolk County. Ultimately the notion of a L.I. regional ashfill never materialized. Therefore, other ways of dealing with ash generated as new RRF's come on line will have to be individually tailored to each situation. Exploration continues to develop safe and viable means of ash disposal (see *TRENDS*).

### *Methane Recovery*

Methane is the by-product of buried garbage in the presence of prescripted amounts of moisture and pressure over time.

In the past, explosions at various area landfills have alerted L.I. municipalities to the need to install permanent methane monitoring devices onsite and nearby to alleviate the problem.

The extraction of methane by energy recovery firms is a beneficial method of reducing the buildup of methane at municipal landfills. Methane buildup and migration can be alleviated by monitoring, venting and commercial extraction. Methane recovery from the area's landfills provides some economic benefit to both local municipalities and private energy-recovery firms, while helping to vent the dangerously explosive methane gas onsite and prevent its migration offsite. Landfills are mined after closure, and sometimes their highest production is reached about five years after they are shut down. In most cases, firms pay royalties to the town where extraction is taking place. The firms produce natural gas from the methane which is either sold offsite or used to generate electricity which is sold to LILCO at a contractual rate.

## GOVERNMENTAL ACTIVITIES

### 1. Federal Government

The *Federal Resource Conservation and Recovery Act* (RCA) of 1976 began the federal regulatory role in solid waste management. The law required state solid waste management plans, the closure of open dumps, and the upgrading of disposal sites to the level of a sanitary landfill, including the placement of clean fill on top of solid waste (*capping*).

With specific reference to RRF's, *Science* (6/87) asserted that

> *..In the United States, neither the federal government nor the states have established a full range of performance monitoring and standards.*

**2. State Government**

Laws such as the *Returnable Container* Law of 1983, the Chapter 229 *Elimination of Land Burial* (on Long Island) Law of 1984, and the law establishing the L.I. Regional Ashfill Board of 1985, along with prior laws like *6 NYCRR Part 360* creating liner criteria have established a new regulatory environment in Suffolk County.

In Governor Mario Cuomo's message to the NYS Legislature (1/88), he indicated that the state will take a more **aggressive** role in solid waste management and will urge such management techniques as source separation, waste reduction and recycling. The state also hopes to provide technical expertise and financial assistance to help local municipalities develop waste management plans. Ultimately, however, MSW was termed a *local responsibility*. Specific proposals contained in the governor's message included: more consistent regulation of landfills and incinerators; grants to municipalities seeking to formulate solid waste management plans; establishment of an office of technical assistance to help local governments deal with their MSW problems; funding to strengthen recycling and source separation programs; and development of a secondary materials industry in the state.

New York State issued its *Solid Waste Management Plan* on March 31, 1987. The document prepared by DEC outlines the state's approach to the solid waste disposal problem. The state will be issuing annual updates of the Solid Waste Plan until the goals of it are achieved (10 years). The first of the *Updates* (1987-1988) to the Solid Waste Plan was issued in December of 1987. The emphasis of the new *Update* is expressed concisely in the following quoted excerpt from it:

> *New Yorkers need to move rapidly from the land disposal-oriented approach of the past to a system of integrated solid waste management.* Management *means treating solid waste as a resource whose value is to be recovered as much as possible and choosing methods of waste handling and disposal which are environmentally acceptable. The Solid Waste Management system should integrate reduction, recycling, recovery and disposal.*

The Solid Waste Management Plan characterizes itself thusly:

> *The plan includes information on the status of solid waste management in New York State; defines problems associated with solid waste; discusses solid waste management methods; identified a legislative, regulatory and program framework for environmentally sound solid waste management; and established goals to bring about integrated waste management within the decade.*

The SW plan is designed to be an evolving reference document (with annual updates during its ten year planning period, 1987-1997). This will give the document flexibility and the ability to respond to new developments or changing conditions.

A solid waste management method hierarchy is advanced as the conceptual format best suited to promote an integrated solid waste management in the decade ahead. The suggested *order of preference* is:

1. waste reduction;
2. recycling and reuse;
3. waste-to-energy;
4. landfilling

To address the state's solid waste crisis the plan includes ten year SW goals, suggested state legislative, regulatory and programmatic initiatives. Possible expansions of state and local government SW roles are discussed.

Waste reduction is the state's ultimate and number one goal. The state aim is to achieve an eight to ten percent reduction by 1997 in the volume of the waste stream. Many state initiatives are directed toward waste reduction through the use of state legislation. The plan includes the following quoted legislative proposals:

- A waste initiator's fee on packaging sold in New York State, with higher fees assessed for non-recyclable packaging;
- Mandatory deposits on tires sold;
- An increase in the price preference given to recycled paper products in state purchase contracts;
- Expansion of the scope of the state Returnable Container Act;
- Establishment of standards for packaging sold in New York State.

The above proposals emphasize reduction of packaging waste; this is because about a third of the state's waste stream is composed of these materials.

Recycling and reuse are envisioned as reducing the waste stream by 50% by 1997 (this includes 8 to 10% by waste reduction proposals cited above). The state plan subscribes to the notion that many materials now entering the SW stream can be reused or recycled, among these are: paper, waste oil, plastic, yard waste, metals, rubber, etc. Many of these can be separated from non-recyclable wastes at their source (the home or business).

According to the plan Update, waste-to-energy technologies can be included in an integrated SWM system; although maintaining that waste reduction and recycling are preferable. Waste-to-energy facilities are viewed as being especially needed during the transition period before waste reduction and recycling have become widespread. The plan estimates that probably up to 50% of the state's waste stream will be handled by these facilities by 1997. Emissions to air by these facilities, using state-of-the-art pollutions controls should not *significantly or unacceptably increase risks to human health and the environment.* During the coming year further state studies regarding air emissions and ash residue and the assessment of health risk are due to be completed.

Landfills have the lowest priority in the state plan. The expressed goal of the state is to use landfills only for disposal of wastes that *cannot be reduced, recycled, reused or combusted in waste-to-energy facilities.* Included in this category are: temporary bypass waste, construction and demolition debris, waste from some rural areas (where other methods are not practical), and ash residues from waste-to-energy facilities.

DEC has a comprehensive permitting and enforcement program in place governing both the construction and operation of landfills. DEC believes its enforcement actions will continue to reduce the number of landfills in the state from 328 (as of June, 1987) to less than 100. Additional landfills may close because they have filled to capacity.

Regarding incineration, with the exception of full scale waste-to-energy systems, it is the state's goal to phase out solid waste incineration where feasible by 1997.

### 3. County Government

All levels of government are acutely aware of the need for long overdue action in the solid waste crisis. The county government is no exception. Both the County Executive's office and the County Legislature have shown concern and are developing proposals, programs, and local laws to deal with the ocean of waste burying Suffolk. New programs and proposed laws have been discussed (such as a battery recycling requirement). The County Legislature, on March 29, 1988, passed a limited ban on plastic food packaging bill. The proposal bans polystyrene or polyvinyl chloride in food wrappings and supermarket plastic bags in the county. Specifically, the bill would prohibit wrappings such as foam *clamshells* (which are used to keep hamburgers and other fast foods warm), plastic grocery bags, and foam meat trays. The County Executive has signed the measure on April 29,1988. The local law will take effect July 1, 1989.

Another controversial environmental measure brought before the County Legislature (1988) is a proposed local law regulating ash from garbage-to-energy plants to the extent of considering the ash as categorically hazardous unless proven otherwise. The whole area of ash regulation and standards is one in flux.

The County Executive, in his first Annual Report message, addressed the solid waste problem. The hope of developing a joint agenda with Nassau for the creation of markets for recycled goods was put forward in the message. The County Executive stressed the importance of the solid waste disposal problem and recognized the significance for the water supply of closing and capping the landfills in the county; he further encouraged recycling and the reduction in the production of waste (generally, indicating support for the goals of the state's solid waste plan). Specifically:

- *fund a study to characterize the waste stream by town and by type of material. A coordinated solid waste plan cannot be implemented without good information about the types, sources and quantities of solid waste produced;*
- *coordinate policies among the towns, including establishment of recycling goals (percentages of the waste stream) by town, with increasing percentages over time;*
- *assume responsibility for the siting of transfer and collection stations to be used for the purpose of temporarily warehousing recyclable portions of the waste stream which would be under the ownership and operation of a private entity;*
- *provide financial incentives to recyclers who participate in or operate recycling programs;*
- *create or contract with a corporate entity to take title to recyclable portions of the waste stream on a county-wide basis and to take responsibility for channelling this material to markets;*
- *solicit corporate involvement by major contributors to the solid waste stream on Long Island by encouraging them to be full partners in the county's recycling efforts;*
- *require all residents in the county to comply with policies, some of which have been instituted already in some towns and villages; to separate recyclable materials for collection;*
- *set an example as a government enterprise by setting up recycling programs for the county, including the review of purchasing specifications to enable procurement of recycled and recyclable materials wherever it is financially feasible.*

### 4. Town Governments

The actual day-to-day operation of disposing of MSW is primarily the responsibility of the town governments. They are operating in a complex regulatory, cost/benefit, and technological environment subject to a continuing *garbage crisis*. Towns are making plans in conformity with the law to deal with their particular situation hoping to custom-design a solution that they can handle. (For a capsule review of each town's situation see the UPDATE OF EXISTING SOLID WASTE SITUATION IN SUFFOLK COUNTY.)

Even as the towns valiantly attempt to handle the waste-generation crisis the realization exists that the problem is partly regional and national in scope.

## EXTENT OF IMPLEMENTATION OF 1987 RECOMMENDATIONS

1. The various permit processes have shown some improvement, flexibility, and timeliness during the past year (much of this due to the extensive media attention caused by the so-called *barge crisis).*

2. Some towns are indeed seeking intertown agreements where complementary facilities may be shared. Smithtown and Huntington, in light of recent DEC approvals, appear very close to a bi-town agreement. Other possibilities include Riverhead and Southampton, as well as Southold and Shelter Island.

3. The ashfill dilemma remains and viable solutions are still needed if resource recovery is to proceed. New ash-processing technologies offer some promise in this area (see TRENDS).

4. Recycling is now a golden word. Virtually every town has or will have recycling programs in place. The state solid waste plan (3-87) gave strong emphasis to recycling. The county government has moved in the area of recycling paper, and is considering other measures. Marketing of secondary materials is now considered a challenge rather than an impossibility.

5. The monitoring of landfills for violation of air and water standards is ongoing by the various agencies involved.

**RECOMMENDATIONS:**

- *Recycling programs should be further encouraged as the number one method of dealing with the incredibly large waste stream.*

- *Waste reduction efforts should be lobbied for by citizens and governments. The manufacturing sector must learn ways to package that are in line with the available techniques to deal with the resultant waste.*

- *An Office of Secondary Materials Marketing should be established to broker the large quantities of recycled matter that will soon become available. Whether the state (through a regional office), county, or a consortium of towns should be where the office is situated is not as important as is that it is set up somewhere and soon (so that the expertise can be developed to effectively run what will be a Recycling Exchange). In a world of raw material scarcity, these North American "wastes" are valuable to others when properly marketed and traded.*

- *Composting should be closely investigated for use here.*

- *A systems approach to refuse separation (both source and service) should be followed.*

- *All batteries should be kept out of the landfill and the incinerator. A system of deposit/refund should be established and cover all types of batteries.*

- *Discarded tires and used motor oil are recyclable and should be reused. Appropriate measures should be enacted to achieve this.*

- *Plastic packaging and the use of polystyrene containers must be controlled.*

- *The importance of public relations campaigns should not be underestimated in accomplishing many of the above goals.*

# ENERGY

## INTRODUCTION

In the year 1988 four-fifths of all the oil discovered in the world has already been consumed. Of this amount North America alone has consumed 80% of the total oil discoved so far. The present U.S. reserves total 36 billion barrels, enough to supply the U.S. for eight years at the current rate of use. Without the glut of oil from the Far East the U.S. economy would be confronting a 1973 oil crisis scenario. This is especially critical because one-fourth of the world's grain is produced in the U.S. where oil provides most of the energy for farming. Third World countries which have rapidly rising food demands and only small quantities of oil reserves, are looking to purchase more oil from the Middle East. The Middle East has reserves of 393 billion barrels (fifty-six percent of the world's reserves). Greater pressure will come to bear on the Middle East as other world reserves which we traditionally relied on, such as Mexico, South America and the North Sea, become depleted. Although the Organization of Petroleum Exporting Countries of the Middle East have yet to solidify production strategies, price rises seem inevitable due to a dwindling world supply of oil.

One of the alternatives to oil, nuclear power, has been fraught with cost over-runs, inadequacy of disposal sites, and lack of confidence caused by the accidents at Three Mile Island and Chernobyl. In fact, most countries in the world have changed their nuclear programs to the point where they are either cancelling the construction of plants, phasing them out or just declaring themselves nuclear-free. The problem after Chernobyl is the projected increase, estimated at 32%, in the use of coal-fired generating capacity worldwide. Carbon emissions have always been used to record energy trends, and since burning coal increases carbon emissions, our atmosphere will be denigrated at a faster pace. The dangerous pollutants from carbon emissions are sulfur, nitrogen and hydrogen, which produce acid rain. Acid rain is responsible for the destruction of 76 million acres of woodland in Europe alone. In the Eastern United States, 9000 lakes are threatened by acid rain, 3000 have been acid altered and 212 lakes in the Adirondack Mountains are devoid of fish. Fossil fuel use dumps 5.4 billion tons of carbon into the atmosphere, deforestation adds another 2.6 billion tons of carbon, for a total discharge of 8 billion tons of carbon annually. One of the dangerous results of excess carbon in the atmosphere is the gradual warming of the Earth's climate due to the insulation properties of this carbon layer, which could result in radical shifts in the Earth's climate. The key to reducing acid rain is to use electricity conservation to lower fuel consumption and use the economic savings for pollution cleanup and traditional acid rain control measures. The Federal Government must as an overall policy, plan ahead by using this time of perceived energy abundance to invest in energy conservation measures. Energy prices are destined to rise again and inefficient economies will be forced to pay a heavy cost.

## THE PRESENT ENERGY SITUATION ON LONG ISLAND

On Long Island the critical question is what will happen after the Shoreham Nuclear Power Plant? In the past 12 years the rate payers of Long Island have paid a total of $1.67 billion toward the construction of the Shoreham Nuclear Power Plant. Last year alone $406 million of rate payers electric costs went to the cost of Shoreham. This appears to be in direct conflict to the used and useful rule passed in 1986 by the New York State Legislature. The County Executive, the County Legislature, state and federal representatives, have come out in opposition to the operation of Shoreham, however, the fate of the plant is still unknown and situation appears to change daily. The New York State Public Service Commission has ordered the Long Island Lighting Company to prepare an energy plan that didn't include Shoreham. LILCO's plan is to promote conservation programs to reduce electric usage by 200 megawatts by 1991. LILCO would also find new sources of energy and develop programs that would extend the lifetime use of its existing power plants. The major thrust of the conservation program would be to shift electric demand from expensive peak hours to off peak cost use. *The Long Island Power Authority* (LIPA), the state agency that has offered to purchase LILCO for $7.45 billion, believes that greater conservation programs can be undertaken. In addition, LIPA believes that if New York State takes over LILCO, $3 billion or a 12% rate decrease could be instituted. At this writing, negotiations between the Governor and the Long Island Lighting Company regarding the closing of the Shoreham Nuclear Power Plant have been completted. The PSC has approved the Governor's plan to close the nuclear power plant and decommission it, however, local state legislators are opposing the plan, stating that it is too expensive for L.I. electric consumers. They want LILCO to bear a greater share of the costs to close the facility.

A 600 megawatt transmission line to be laid across Long Island Sound providing upstate power is scheduled to be implemented between 1989 and 1992. In addition, 400 megawatts of Quebec hydropowered electricity will be available for Long Island is 1995-96. Another method to reduce peak power usage is to encourage large companies to put cogenerators in place to reduce their overall power usage at peak periods. Not only would this cut down on energy use but electric bills, which are based on peak summer power usage for the rest of the year (using the so called *ratchet* clause), would also be reduced. The Grumman facility in Bethpage is in the process of completing a 50 megawatt cogenerating system.

Other options for Long Island include purchasing electricity from the New York Power Authority, Con Edison, Municipal Electric Systems, New York Power Pool, Norwalk Harbor and small power generators. A *Conservation Voltage Reduction* (CVR) program which has been utilized on the west coast should be explored.

### Liquid and Solid Fuels on Long Island

As of January 1988, the average selling price for #2 home heating oil on Long Island was 99.31 cents per gallon, up 7 cents a gallon from January 1987. The January 1988 cost is exactly the same as in 1980 after which the price rose to $1.24 per gallon in 1981 before gradually slipping to 79 cents in August of 1986. From August of 1986 the price of oil has slowly risen to its current value. As of January 1988, kerosene costs $1.00/gallon, up 4 cents from last January. Propane cost $1.49/gallon as of January 1988, up 35 cents a gallon from January 1986, coal costs $140/ton in January 1988, up five dollars from January 1986, wood costs $99 per full cord in January 1988, the same price as a year earlier, and finally, regular unleaded gasoline cost 97.3 cents/gallon on Long Island in January 1988, up 11 cents from January 1987. The last pertinent statistic, electricity, costs 11.56 cents/kilowatt for residential customers, up from 11.06 cents/kilowatt in 1987.

## GOVERNMENTAL PROGRAMS AND ACTIVITIES

### 1. Federal Programs

The material in Table 38 represents a comparison between 1981 and 1988 appropriated and 1989 requested appropriations to the Department of Energy. The Department of Energy serves the dual role of coordinating the country's civilian energy programs and providing nuclear weapons to the Department of Defense. The weapons activities have grown from 38% in 1981 to 61% in 1989. Solar and renewables have decreased from 19% in 1981 to a 4% request in 1989.

**TABLE 38**
**DOE Energy Technologies Budget ($ millions)**

| | FY 1981 Approp. | FY 1988 Approp. | FY 1989 Request |
|---|---|---|---|
| Conservation | $ 802 (19%) | $ 366 (17%) | $ 89 ( 4%) |
| Nuclear Fission | 1008 (24%) | 964 (44%) | 1163 (48%) |
| (Waste Fund) | (0) | (360) | (449) |
| Nuclear Fusion | 394 (10%) | 335 (15%) | 360 (15%) |
| Solar/Renewables | 771 (19%) | 118 ( 5%) | 97 ( 4%) |
| Fossil Energy[c] | 1134 (28%) | 404 (18%) | 693 (29%) |
| **TOTAL** | **$4108** | **$2187** | **$2402** |

**2. State Programs**

**N.Y. State Energy Programs**

The N.Y. State Energy Office was established in July, 1976, charged with the responsibility of maintaining an adequate continuous, safe, dependable supply of fuel for New York State. The N.Y. State Energy Office has developed an Energy Master Plan which is used in forecasting future energy needs. The following components help insure the success of the master plan - Division of Policy Analysis and Planning, Division of Conservation, the Office of Communication, and the Office of Counsel. An energy hotline (1-800-342-3722) is maintained for information.

All of the following programs representing the New York State Energy Office conservation efforts for 1988 are funded by monies from Exon Overcharges and Kansas Stripper Wells won by the Federal government and distributed to State governments.

a. Industrial and Commercial Programs
   Financial assistance - Energy Investment Loan Program
b. Industrial/Commercial Technical Assistance Services
   The Energy Advisory Service to Industry
   The Small Business Energy Efficiency Program
   The Agricultural Energy Conservation Program
c. Institutional Programs
   The Institutional Conservation Program
   Supplemental Institutional Conservation Program
   Small Institutions Energy Program Assistance
   Not-for-Profit Energy Conservation Program
   State Facilities Energy Conservation Program
d. Residential Programs
   Energy Conservation Bank
   Appliance Rebate Demonstration Program
   Demonstration Furnace and Boiler Rebate Program
   Residential Technical Assistance and Training Services
   Radon Program
   Residential Conservation Assistance
e. Codes and Standards Programs
   The Lighting Efficiency Program
   The Appliance Efficiency Program
   The Energy Code Program
f. Transportation Programs
   Fleet Energy Efficient Transportation
   Signalized Traffic Optimization Program
   Transportation Systems Management Program

***New York State Energy Research and Development Authority (N.Y.S.E.R.D.A.)***

NYSERDA is sponsoring six research projects in Suffolk County totalling $4.2 million. These include:

- Hubbard Sand & Gravel - wood energy project
- Ash Use Project with the Long Island Regional Planning Board
- Recycling Project in East Hampton with Queens College
- Recycling Project in East Hampton with Robinson Assoc.
- National Thermal Spray
- Long Island Railroad Regenerative Braking System.

**N.Y. State Department of Transportation**

The N.Y. State Department of Transportation furnishes an energy analysis for all highways development with federal aid. The analysis includes the energy consumed by vehicles using the facility, energy to maintain the facility, energy consumption likely to result from project induced land use changes in energy consumption and maintenance due to increased or decreased automobile use.

**The New York Power Authority (PASNY)**

The Marcy South Transmission Line, the main connection to Quebec Hydro was be dedicated in June of 1988. In this regard the Corps of Engineers are in the process of obtaining permits for a cross Long Island Sound power line to be completed by 1991. The N.Y.S. Public Service Commission has already given its approval on this project in April 1988. This line will be able to carry an additional 600 megawatts to Long Island. Some of this additional power will come from Niagara and from the Blenheim-Bilboa project. In 1995 a contract with Quebec Hydro will go into effect bringing an additional 217 megawatts to Long Island and in 1997 an additional 180 megawatts will be brought in from the Niagara expansion project.

As stated in a prior section, the Grumman Corporation is in the process of constructing a 50 megawatt cogenerating plant. The plant will offset Grumman's electric bill by the sale of generated electricity to LILCO. Grumman presently purchases its electricity at a reduced rate from the Fitzpatrick nuclear power plant.

Municipal distribution agencies (MDA) set up to obtain reduced upstate power are currently under attack. An initial court decision in February 1988 based on an upstate MDA challenge has disallowed preference power to MDA statewide. Preference power to MDA has saved Long Island $9 million since 1985.

**SUNY at Stony Brook**

The State University at Stony Brook is fine tuning their energy producing equipment as part of their energy conservation program. The following improvements have been implemented. Using computer controls, replacing single speed fans with variable speed fans, modifying boiler and chiller controls, using high steam discharge pumps, and replacing existing windows with storm and thermopane insets.

**3. Suffolk County Programs**

Suffolk County is involved in an energy audit program for its major buildings. The results of these audits will be utilized as back-up material for energy conservation programs. Other projects, both with LILCO, include load shedding and rebates for changing over to energy efficient equipment.

### Suffolk County Consumer Affairs Department

The Suffolk County Consumer Affairs Department is subdivided into 3 sections, all of which are among other things, energy related.

- The complaint section enforces Chapter 249 of the Suffolk County Code dealing with deceptive trade practices.
- The licensing division licenses plumbers, electricians, insulation installers, appliance repair and video repair, enforcing Suffolk County Code Chapters 275, 345 and 627.
- The weights and measures division tests all meters and measuring devices involved in the distribution of energy, such as oil, gasoline, propane, coal, wood, etc. This comes under the N.Y.S. Agricultural Markets Law Article 16.

### Suffolk County Energy Management Commission

The *Suffolk County Energy Management Commission* (SCEMC), formerly the Suffolk County Solar Energy Commission, was organized in 1979 by the Suffolk County Legislature. The commission's original goal was to bring solar awareness to the public and the Legislature. That role has increased to the areas alternative energy, such as wind, hydrogen, nuclear and electric power, cogeneration, as well as county energy planning. The SCEMC prints an informative monthly Newsletter, organizes energy seminars, maintains outreach programs to groups such as town planning departments, building departments, libraries and various public schools in Suffolk County. In addition, the commission maintains an energy information phone number for the homeowner, builder and architect.

### Fleet Service Unit

The Fleet Service Unit is under the jurisdiction of the Transportation Section of the Suffolk County Police Department. The Suffolk County fleet is composed of 1000 automobiles for department use, maintained by fleet management, and approximately 1000 trucks which are maintained by individual departments.

The present policy of Suffolk County is to use reconditioned police vehicles for the county's automobile fleet. These automobiles are normally transferred from the Police Department and reconditioned after 65,000 miles of use. They are either full size Ford Crown Victories or Plymouth Fury's, both of which are eight cylinder type cars. Under Fund 16 maintenance and gas costs for each departments' cars are charged back to that department.

Department heads, assistants and Legislators purchase cars using their individual department budget. Car models purchased vary depending on bids received based on specifications for the size of the vehicle. The prices range from $9,000 to $12,000.

In 1988 the County Executive instituted two energy budget cutting measures at the Fleet Service Unit: the retiring of 218 cars from the 1000 car fleet and eliminating 2402 credit cards from the original 3300 issued. The credit card elimination policy was started because the county can distribute county purchased gasoline cheaper than individual credit card purchases.

### Suffolk County Community College

The Community Colleges energy conservation program includes using a Honeywell Computer updated with a personal computer interface to monitor all energy use, changing to #4 from #2 oil for higher efficiency and less maintenance costs, replacing all windows with thermopane insets, replacing all roadway lights with energy efficient lights, replacing oil burners and boilers with high efficiency models, replacing fluorescent lighting with high efficiency watt savers and utilizing high efficiency ballasts, replacing incandescent lighting with high efficiency CAPSY lights, and removing hot water coils from boiler and using individual hot water heaters to allow all boilers to shut down in warmer weather.

### Suffolk County Planning Department

The Suffolk County Planning Department is in preliminary stages of its 21st century plan which will include a segment on energy planning. The Transportation Division carries out the following responsibilities:

- Determines and establishes basic overall policy with regard to transportation in the fields of surface, air, and marine transportation and in this regard, develops a comprehensive transportation plan for the county to meet its present and future needs.
- Operates public transportation facilities that are owned, leased or managed by the county including contract preparation and administration.
- Administration of the state *Mass Transportation Operating Assistance* (MTOA) program and the countywide reduced bus fare program.

### Suffolk County Social Services Department

The Suffolk County Department of Social Services administers the *Home Energy Assistance Program* (HEAP)

### 4. Local Programs

Most towns in Suffolk County with established landfill sites are mining the methane gas byproduct. The gas, which when left unchecked, is a health and safety hazard. It is either cleaned for use as a natural gas fuel or used to generate electricity for sale to LILCO under the federal *Public Utility Regulatory Policies Act.* (PURPA) Program. The PURPA Program requires the utility to buy electricity generated on site for sale, and this year the buy back price is going up to 9 cents/Kw. In addition, towns have programs for replacing street lights with less expensive to maintain sodium lamps, replacing fluorescent office bulbs with long life bulbs, purchasing only four cylinder automobiles, and retrofitting windows with thermopane insets. Most recently towns are involved in recycling paper, both high grade and newsprint, and some are involved in recycling cans, bottles and collecting oil. Specific town energy programs include the following: Brookhaven Town - leaf composting, wood chipping program and approximately 25% of the town is involved in a newspaper recycling program; Islip Town - resource recovery center; Babylon Town - recycled waste motor oil for space heating fuel in town facilities, and a NYSERDA sponsored ash recycling project with SUNY at Stony Brook; and the solar greenhouse for educational functions in Huntington and Brookhaven. Smithtown is undergoing energy audits and is in the process of constucting a passive solar addition to its Nature Center at Hoyt Farm. Southold has a comprehensive recycling, composting program. East Hampton and Southampton Towns have adopted wind energy ordinances. Although none of the ten towns in Suffolk have yet to adopt a solar access ordinance, East Hampton comes closest by requiring a solar diagram on all subdivision submissions. Also, East Hampton is one of the few towns to encourage solar energy in site plan review.

**Suffolk Community Development Corp.**

*The Suffolk Community Development Corp.* (SCDC) was organized in 1968 to help lower income families with home improvements. The SCDC has present jurisdiction east of the William Floyd Parkway, not including the Town of Southold, and is involved in the following three programs:

- Home improvement in East Hampton
- The *Restore* program, a N.Y. State funded home repair program for senior citizens
- *The South Fork Home Improvement Program* funded by the N.Y.S. Affordable Housing Corporation.

**Suffolk Economic Opportunity Council (EOC)**

The EOC manages the weatherization program for the Towns of Smithtown, Brookhaven, Riverhead, Southold, Southampton, East Hampton and Shelter Island.

**Energy Groups**

The *New York Public Interest Research Group* (NYPIRG) has organized cooperatives to purchase wholesale fuel oil in bulk in order to reduce individual costs. NYPIRG has also lobbied against the practice of irradiating food, hazardous ash waste, continuing nuclear power plants, and creating a low level radioactive disposal facility in New York State so that these wastes can be periodically monitored.

**Long Island Energy & Environmental Association (LIEEA)**

The *Long Island Energy & Environmental Association* is a non-profit public educational group with members in both Nassau and Suffolk Counties on Long Island. LIEEA's goal is to provide the public with unbiased factual information on topics such as solar energy, energy conservation and environmental issues. Events include solar home tours, energy efficiency in older homes, and resource recovery.

**Cooperative Extension Service**

The *Cooperative Extension Service* (CES) main energy related work is with the Small Business Energy Efficiency Program whereby small businesses under 15,000 sq. ft. are given free energy audits. CES also provides energy related educational fact sheets.

**Brookhaven National Laboratory**

The *Brookhaven National Laboratory* (BNL) founded in 1947 under a consortium of associated universities, is involved in research in the following areas: alternative fuels, high performance heat pumps and compressors, fuel cells, hydrogen technology, coal conversion, residential heating systems, air infiltration, and recovery of underground gas and oil. In the field of energy efficient housing, the lab is intent on building an international village. The first building already completed, the Danish House, is to eventually be followed by prototypes from Italy and Japan.

**BOCES**

*HIGH SCHOOL PROGRAMS*

Approximately 200 students in the BOCES program learn about energy related principles in heating, air conditioning, trade electricity, carpentry, building maintenance, automotive mechanics, aviation mechanics and small engine mechanics.

**RECOMMENDATIONS**

The present administration is moving ahead with energy programs which include:

- *Peak period load shedding of selected county buildings,*
- *Energy auditing of fifty county buildings over 10,000 square feet in size. The audits for these buildings will include recommendations for energy saving courses of action.*
- *The people of Suffolk County are paying one of the highest costs for energy in the country, therefore, Suffolk County should become a model area for energy awareness and should set an energy standard for the country.*
- *The County Government should take the lead by taking a comprehensive look at energy use and abuse. Energy efficiency should be considered along with other factors when the county leases buildings in the future. The monies saved could be used to update systems. The County of Suffolk should implement monitoring of all buildings owned and rented on a total square foot energy cost basis including oil, electricity, gas, and calculations for heat loss and heat gain. Goals should then be set and a critical path procedure should be implemented to bring the energy square foot cost as close to a uniform level as possible.*
- *All capital program items when reviewed should also take implications into consideration when possible.*
- *Wherever possible, existing buildings in the county should be retrofitted to comply with the N.Y. State Energy Code requirements.*
- *Capital costs for county cars purchased should take long term costs including the lifetime purchase of gasoline into consideration.*
- *Energy awareness courses should be encouraged at all levels of education.*
- *All new county buildings should include as part of their design, energy saving techniques (such as passive solar, natural ventilation, daylighting, and shading devices).*
- *Long Island's long-term dependence on oil should be minimized by promoting other energy alternatives including the use of passive and active solar technologies.*
- *There is no coordination between the Weatherization Program and the HEAP Program. HEAP is administered by Social Services for low income people while the Weatherization Program for low income people is administered by another agency. Both programs should be coordinated since one gives money to purchase fuel and the other saves fuel by weatherizing homes.*
- *Suffolk County Planning and all municipal planning agencies should adopt comprehensive long-term development plans which consider energy usage and alternatives.*

# HAZARDOUS MATERIALS CONTROL

## INTRODUCTION

Hazardous materials control in Suffolk County has evolved over the past two decades into a very complex program, which is more comprehensive and advanced in most respects than any similar program in the country. Suffolk, with its trend-setting laws has developed a reputation as the national leader in hazardous materials control. For many years, states and other local jurisdictions have been turning to Suffolk for advice and examples on how to regulate and store hazardous materials. Even the federal government has depended heavily on Suffolk's experience and counsel in preparing the new EPA national underground tank regulations, and they have funded research projects to gather valid, unbiased statistical information from old steel tanks and new non-corrodible tanks in Suffolk.

In the 1960's, hazardous materials were not thought of as a separate subject but only as they occurred in industrial point-source discharges. These were slowly brought under control through vigorous application of the state permit system which became in the early 1970's the *State Pollutant Discharge Elimination System.*

As this program advanced, it became evident that regulation of storage facilities for hazardous materials (tanks, drums, etc.) was necessary to minimize leakage and spillage, but no regulation addressing the subject existed at any level. Article 12 of the Suffolk County Sanitary Code was finally passed in 1979 for this purpose with the general philosophy of secondary containment for everything, and replacement of all existing facilities to meet the code.

This law established standards more stringent than any in the entire United States but still was not considered completely adequate as a permanent program to protect the groundwater from toxic materials. Article 7 of the Sanitary Code was passed in 1985 with the hope of finally affecting the development pattern of the county in a manner that would permanently preserve the groundwater resources.

This law does not allow any new companies that store more than 250 gallons of toxic materials to locate in the deep recharge zones or water sensitive areas of the county. Pre-existing companies are not allowed to expand beyond their 1985 storage capacity. This has stopped the proliferation of industries using chemicals form locating in the central portion of the county and forced them to locate in the outer edges closer to the shore where less damage to the groundwater will result from a spill.

These laws form the basic foundation of the county hazardous materials control effort, but there are many more pieces that fit together to make up the total program. These include emergency response efforts to minimize public and environmental damage from chemical emergencies, management of cleanup activities, definition and remediation of areas of groundwater contamination through state and federal *Superfund* programs, investigation of the behavior of old and new underground tanks through federal research grants, a search for old aerial photographs, management of the cesspool additive ban, dissemination of public information on toxic and hazardous materials and response to complaints.

Because of the strong local laws, the state *Petroleum Bulks Storage Program* was delegated to Suffolk County and as a result, Suffolk residents do not have to deal with the state on petroleum installations. Except for major facilities, the county law prevails.

## ARTICLE 12

### *Tank Testing*

Article 12 of the Sanitary Code requires replacement of all underground tanks with non-corrodible, double walled (in most cases) facilities, except for on-premises heating oil tanks. Until the old tanks are replaced, which must occur by January 1, 1990, the law requires that they be periodically tested for leakage.

To-date over 7200 tanks have been tested of which 270 or 4 percent were found to be leaking. This has dropped from 15% in 1981 when most tanks were being tested for the first time, probably because the program has successfully eliminated most of the actively leaking tanks. In 1987, there were 831 tests performed. The number should be similar for this year but then should drop off as the mandatory replacement date approaches. Only heating oil tank testing will continue after 1990 since these tanks are currently exempt from the replacement requirements.

### *Tank Replacement Program*

A major goal of the Article 12 program is to get all of the old buried steel tanks replaced with non-corrodible ones with secondary containment, in most locations, by January 1, 1990. To-date about 2850 new tanks have been installed but there are still at least 4500 to be replaced. A major rush of construction activity is expected as the word goes out that the replacement date is near. There were 425 new tanks approved in 1987 but that number should be much higher in 1988.

The county must also test and replace its own tanks. There are 485 county tanks registered of which 120 must be replaced. A major contract for tank replacement and upgrading has been let by the Department of Public Works (DPW) and work will begin soon. Health Department crews have tested 178 county tanks so far and have discovered 32 leaks.

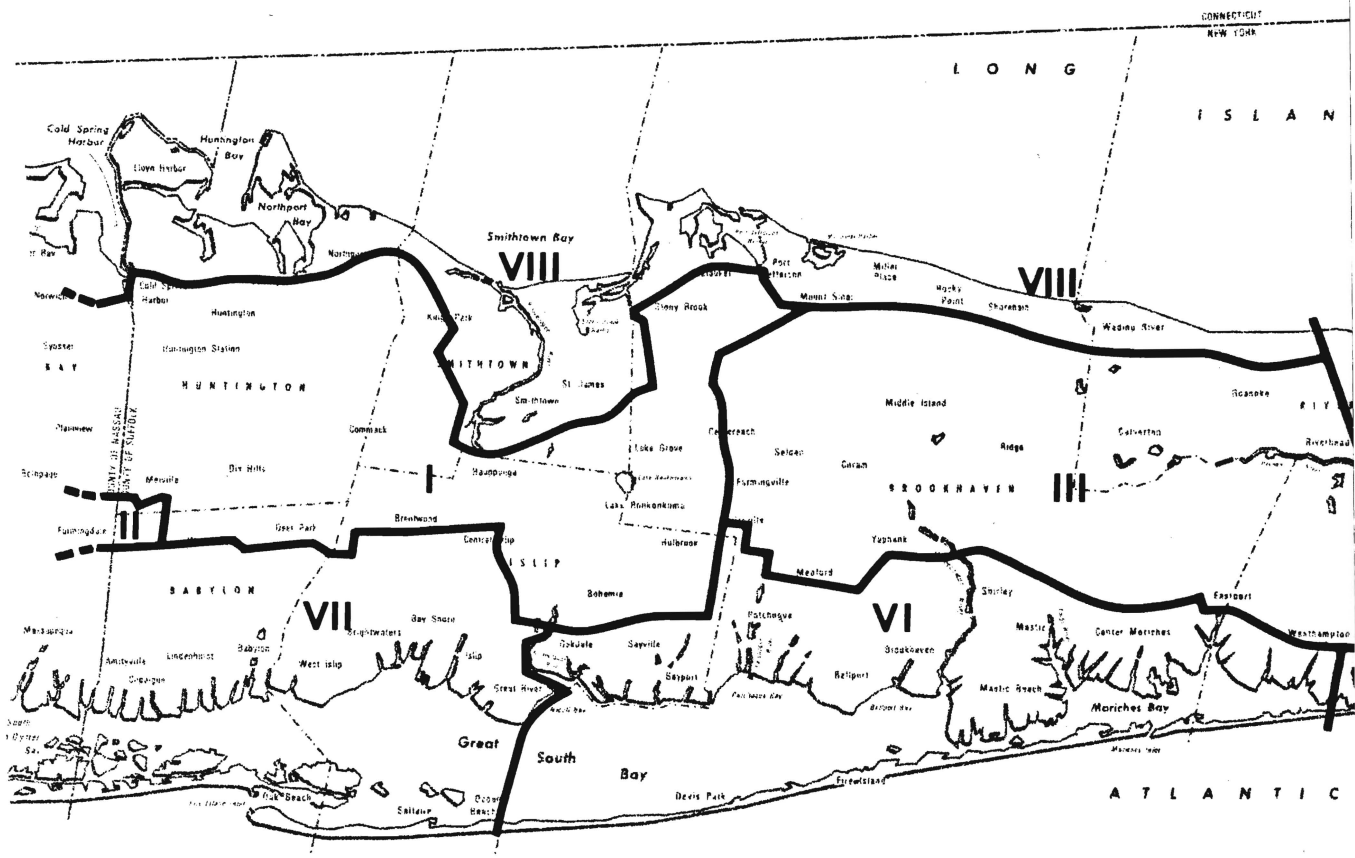
### *Proposed Changes*

Recently, changes to Article 12 have been proposed to the Board of Health to help correct some of the deficiencies in the original law. Several of the more important ones include:

- A proposal to eliminate the allowance for single-walled tanks for petroleum products outside the deep recharge zone and instead require double-walled tanks everywhere;
- A proposal to regulate underground piping associated with above-ground tanks which was previously not covered;
- A proposal to require observation wells around all above-ground tanks;
- A proposal to require that tanks be removed from the ground when they are abandoned rather than allowing them to be filled with sand;
- A proposal to require that by the year 2000 all existing single-walled non-corrodible tanks be replaced with double-walled facilities.

## SPILLS AND REMEDIATION

The continual discovery of sources of contamination from old discharges, spills, tank and pipe leaks, and accidents emphasizes the need for the regulations that are currently in place and reinforces the importance of increasing field inspection services.




Last year Northville Industries discovered the largest fuel leak in Suffolk history when they found over 650,000 gallons of gasoline under their Holtsville terminal. This year they topped that record by discovering a leak of over 800,000 gallons of gasoline under their Setauket terminal. Fortunately neither has yet affected any wells or homes but unfortunately both are located in the deep recharge zone and have affected a vast quantity of groundwater. Many, many years will be spent in cleaning up these two spills, both of which resulted from apparently minor underground pipe failures.

In addition to the two Northville Industries' spills, there are about 200 other spills and leaks of petroleum, solvents and other chemicals actively being cleaned up or investigated at the present time. The *Department of Environmental Conservation* (DEC) takes responsibility through Article 12 of the State Navigation Law for petroleum spill clean-up and the county coordinates to see that county interests are satisfied. Chemical spills are usually managed directly by the county.

## ARTICLE 7

Article 7 of the Sanitary Code prevents new industries with chemical storage or discharge from locating in the deep recharge or water sensitive zones as identified in Figure 1. In 1987 there were ten applications to the Board of Review for variances in some form from the restrictions of Article 7.

Many calls were received from interested parties concerning real estate transactions and the acceptability of land uses under Article 7. The concept seems to be working.

## SUPERFUND

There are two separate Superfunds: one managed by the state and one by the EPA for the federal government. Both serve the same purpose, to clean up hazardous waste and groundwater contamination sites. The federal fund also has provision for emergency funds to provide water supplies where needed.

Sites are normally nominated by the county, go to the state for evaluation and if ranked high enough, go to the EPA for consideration for the federal list. The Suffolk combined list currently consists of 100 sites in three major categories: landfills, industrial sites and contaminated groundwater plumes. Progress on investigating them is moving ahead smoothly, if slowly, on a broad front with nearly all of them under active scrutiny. Several have advanced to the stage of active drilling and sampling and most have had Phase I and Phase II plans completed.

More sites are being nominated routinely as they are found. It should be noted that, except for the landfills, almost none of the existing sites are *buried drum sites.* They are instead, identified areas of groundwater contamination that require further definition and in some cases, remediation.

Federal Superfund Emergency funds have been used to provide water in 15 different locations funds totaling over $3,000,000. Three more sites are currently under consideration.

One problem with the program is that it creates a tremendous load of freedom-of-information requests for copies of department files for report preparation. One man has been assigned nearly full time to this duty.

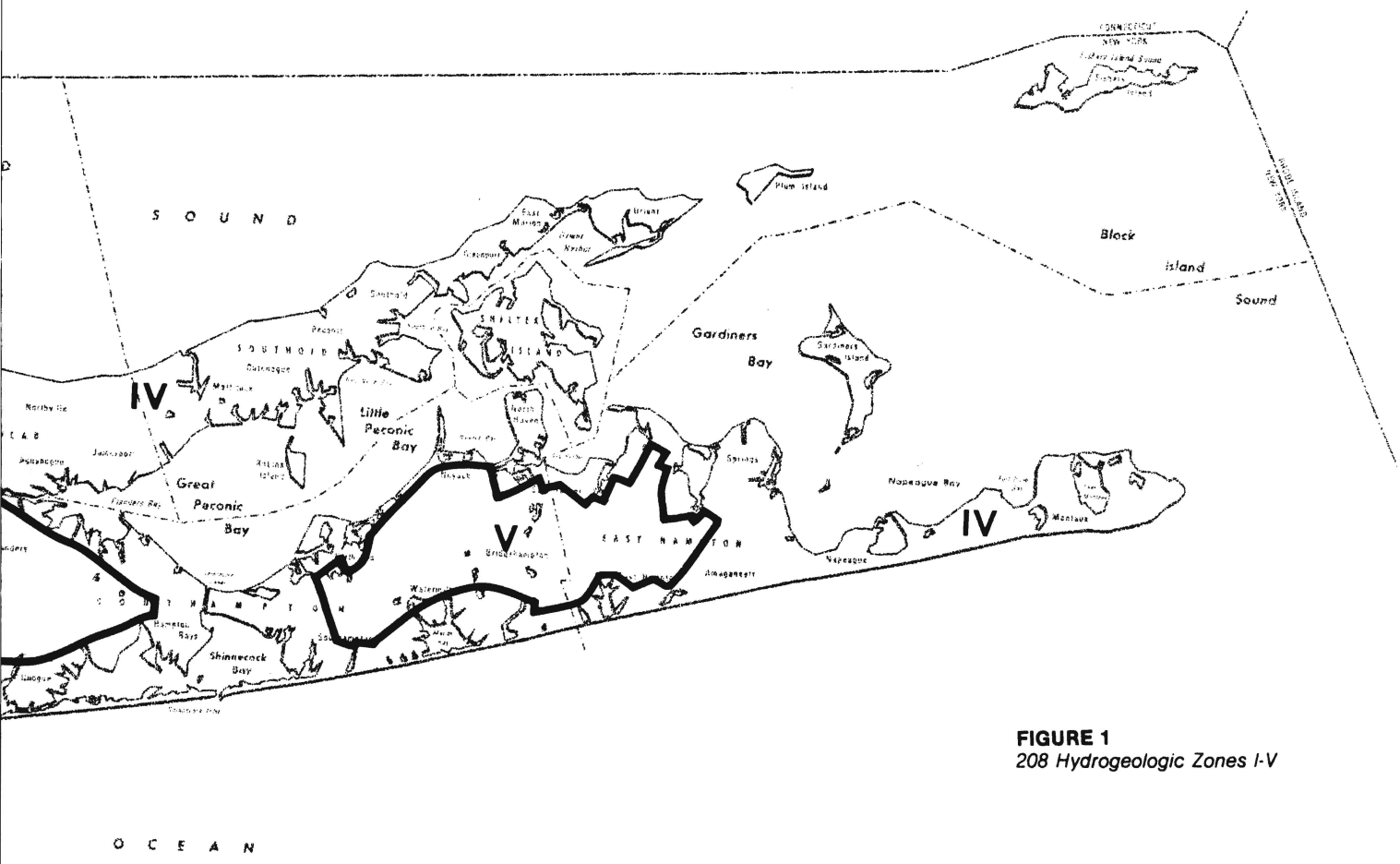



**FIGURE 1**
*208 Hydrogeologic Zones I-V*

## EMERGENCY RESPONSE

The Department of Health is a vital partner in the county emergency response effort providing 24-hour-a-day service. The whole staff of the *Bureau of Hazardous Materials Control, the Bureau of Water Pollution Control,* and *the Inspectional Services Section* are available on call at any time to respond as needed. There were 75 hazardous materials incidents in 1987 of which approximately 30 required after-hours response.

The most notable emergency incident of the year involved several rusted out cylinders of compressed hydrogen fluoride gas which had to be neutralized by a team of response personnel from the EPA. Other problems involved fires, spills and abandoned drums.

## STUDIES

### *Toxic Dump Study*

Cornell University's Laboratory for Environmental Application of Remote Sensing has completed its first phase of the capital budget toxic dump study with the discovery of 656 potential dump sites to be further investigated. The contract has been extended into 1988 to allow the examination of two more sets of photos to bring the study up-to-date.

### *Steel Tank Corrosion Study*

This study, funded by the federal government, has been underway for over a year and has resulted in the issuance of 4 interim reports covering the examination of 320 tanks. The purpose is to gather useful corrosion information from old tanks being removed in Suffolk because of our tank replacement program under Article 12. The most interesting findings so far are that nearly 1/3 of all the tanks removed actually have holes in them, and nearly all of the ones with holes are the smaller tanks (5,000 gallons or less).

### *Non-Corrodible Tank Study*

A second federally funded study is also underway with the purpose of examining the new-style non-corrodible tanks that have been installed in Suffolk to determine how well they are functioning. The study is just getting underway so there are no results yet.

## PROBLEMS

### *Household Hazardous Waste Collection*

It is presently difficult for homeowners to property dispose of small quantities of hazardous materials. The town Stop Throwing Out Pollutants (STOP) days that are periodically scheduled are good but not adequate.

A good solution would be for each town to set up a permanent permitted collection point at the landfill where people could bring their materials for proper storage and eventual disposal by town-hired industrial waste contractors.

### *Article 7 Deficiency*

Article 7 needs to be strengthened by removing the grandfather clause that allowed all existing industries with hazardous materials to remain in the deep recharge zone. A long-term plan needs to be developed to assist such facilities to phase out of the protected zones and into the less sensitive areas before more disasters lake the Northville spills can occur.

### *Personnel*

More personnel are needed to keep up with the tremendous growth in industrial and commercial construction in the county and the tank replacement program.

# ENVIRONMENTAL REVIEW AND ENFORCEMENT

## INTRODUCTION

The other sections of this report cover all major aspects of Suffolk's environment together with the numerous federal, state, county and local environmental laws that are relevant. However, large projects in many instances can affect one or more environmental areas and, therefore, need a broad environmental review. Overall environmental review of any given project is mandated by the *National Environmental Policy Act* (NEPA) at the federal level, and by the *New York State Environmental Quality Review Act* (SEQRA) at the state, county and local levels (see Figure 2). The details of these two acts have been discussed at length in past environmental reports.

In addition to the federal and state environmental laws, New York State, under Article 47 of the Environmental Conservation Law and Article 12F of the General Municipal law, allows for the creation of Environmental Management Councils at the county level and the Conservation Advisory Councils at the local level. These councils advise their respective governing bodies on environmental matters within their jurisdiction.

The Environmental Services Unit of the Bureau of Environmental Pollution Control in the Suffolk County Department of Health Services works closely with the County Attorney's Office to enforce the Suffolk County Sanitary Code, either through administrative action, or application to the courts. In addition, the District Attorney has been given concurrent jurisdiction with the Attorney General to enforce the criminal prosecution of the State Environmental Conservation Law. The Environmental Services Unit provides technical assistance to the District Attorney to facilitate enforcement of the criminal environmental laws. The Suffolk County Department of Health Services' Radiation Control Unit also is responsible for inspection of x-ray facilities throughout the county.

## PROBLEM AREAS AND TRENDS

At the federal level, environmental priorities of the Reagan administration have taken a back seat to those of defense and economics. In fact, the federal government over the past years has shifted the responsibility of environmental review to the state and local levels. As demonstrated in this and past Annual Environmental Reports, the County of Suffolk has taken a very active role in environmental preservation. In fact, as the development in Suffolk County has escalated in the recent economic boom, the efforts of the Suffolk County Executive, Legislature and various county departments have intensified in environmental planning, review and permitting areas in order to insure the health, welfare and safety of all county residents. At the local level too, environmental review is increasingly becoming an integral part of the planning process. Town planning boards have been finding that environmental impact statements are a useful tool in evaluating new subdivision proposals, and the SEQRA process is being enforced more diligently in the subdivision and building permit reviews in order to insure that new development will not adversely impact the environment at the expense of the local community. Most towns also have their own environmental protection laws which may include such things as noise, air quality, water resources, vegetation removal, and slope protection.

## GOVERNMENTAL PROGRAMS AND ACTIVITIES

Table 39 summarizes the major federal, state and county laws dealing with general environmental review and enforcement.

### 1. Suffolk County

***Council on Environmental Quality -***

Article 1, the Environmental Bill of Rights of the Suffolk County Charter, formed the Council on Environmental Quality (CEQ) in 1970. Part of the council's functions is to review county initiated projects and activities and to make a recommendation to the County Executive and Legislature as to the potential environmental impacts and what procedures should be followed under SEQRA. During 1987 the CEQ held 12 monthly council meetings and one special meeting to review county projects and activities. Early in the year they also reviewed the 1987-89 County Capital Program. A total of 80 new items were commented on in the 1987-89 Capital Program as to what their environmental review requirements would be pursuant to SEQRA. During the course of 1987, the county completed environmental review of 73 projects and activities. Of the total, 51 negative declarations were issued. Many of the projects were modified to minimize environmental impact as a part of the negative declaration, none of the projects were disapproved on the basis of SEQRA. Fifteen projects were classified as Type II actions and 3 were exempt, requiring no further environmental review. In addition, 4 projects were recommended to require environmental impact statements, which included:

1. Proposed Suffolk County Local Law Regulating Landfill Deposit of Ash;
2. Proposed New Dredging of Trues Creek;
3. Proposed Reconstruction of C.R. 100, Suffolk Ave. Extension, Phase II;
4. A Generic Environmental Impact Statement for Suffolk County Maintenance Dredging Projects, the SEQRA lead agency being NYSDEC.

Under its charter mandates, the CEQ members are also the members of the Suffolk County Historic Trust. They recommend what properties should be dedicated to the Suffolk County Historic Trust, as well as provide guidelines in the management of the county's many historic owned structures. During 1987 the CEQ's Historic Trust Committee, whose members include all of the Town Historians as well as the County Historian, met twice.

***Historic Trust Division -***

1987 continued the efforts of Suffolk County government to protect the historic and architecturally significant structures under its jurisdiction. New land parcels acquired through the Open Space Program have increased the number of historic structures owned by the County of Suffolk to nearly 130 buildings. In addition, the dedication of several distinctive county properties to the Suffolk County Historic Trust were recommended by the Historic Trust Committee. Major preservation projects which the Historic Services Division, as administrator of the Historic Trust Program, were involved with during 1987 included the following:

*BLYDENBURGH PARK HISTORIC TRUST AREA -*

Restoration continued on the 18th century New Mill and the structure, nearly a ruin five years ago, now boasts new shingles, doors, windows and flooring which duplicate its appearance about 1878, the restoration target date. During the next year it is hoped that the antique mill machinery purchased by Suffolk County from a Maryland mill in 1985 will be installed in the New Mill to return it to operating condition.

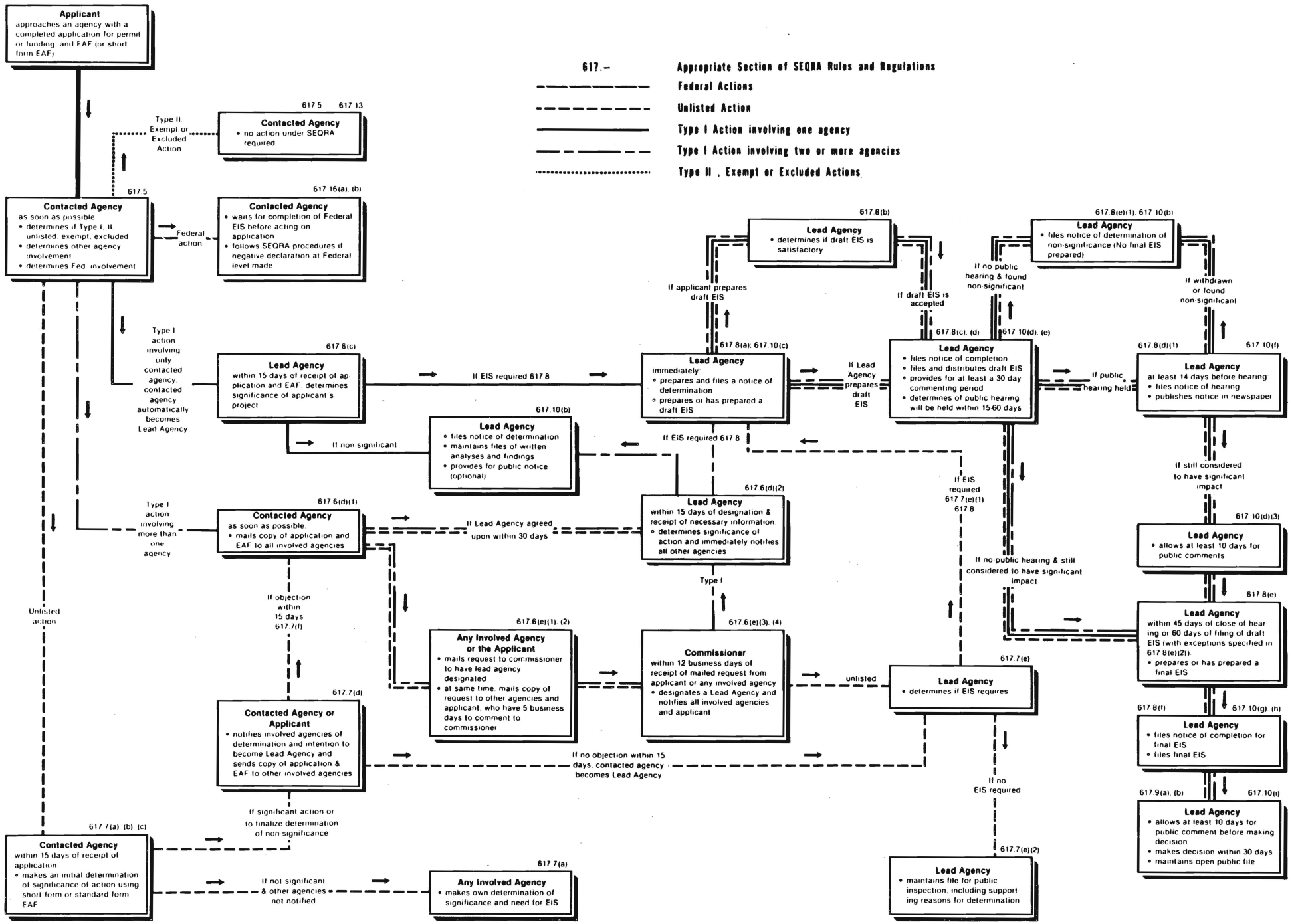



**FIGURE 2**
*SEQR Procedures*

**TABLE 39**
**Major Federal, State and County Laws Dealing With General Environmental Review and Enforcement**

| Name (Citation) | Administering Agency | Primary Purpose | Major Provisions |
|---|---|---|---|
| **FEDERAL** | | | |
| National Environmental Policy Act (42 U.S.C. Sect. 4321 et. seq.) | Council on Environmental Quality and all Federal Departments and agencies | Reduce the degradation of the human environment and achieve a balance between development and resource use. | Requires federal agencies and licenses to analyze impacts of actions on land and water resources and to choose the environmentally preferable alternatives or to explain why that alternative was not chosen. |
| **STATE** | | | |
| State Environmental Quality Review Act - Art. 8 of the Environmental Conservation Law | Department of Environmental Conservation and all state and local agencies | To declare a state policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and enhance human and community resources; and to enrich the understanding of the ecological systems, natural, human and community resources important to the people of the state. | Requires all state and local agencies and licenses to analyze impacts of actions on the environment and to minimize any impacts that cannot be avoided. |
| Title 6 NYCRR Part 617 | Department of Environmental Conservation and all state and local agencies | Rules and Regulations implementing SEQRA | 1. Sets guidelines for environmental impact assessments and statements and when they are required.<br>2. Establishment of lead agency.<br>3. Review time schedules. |
| Article 71 of the Environmental Conservation Law | Department of Environmental Conservation and County D.A. Offices | Enforcement of N.Y. Environmental Conservation Law | 1. Governs DEC and Attorney General's enforcement of the E.C.L.<br>2. Gives delegation of criminal enforcement authority to the District Attorney of the County in which the violation occurs. |
| **COUNTY** | | | |
| Environmental Bill of Rights-Article 1 of the Suffolk County Charter | Council on Environmental Quality and all County Departments | The policy of Suffolk County shall be to conserve and protect its natural resources, including its wetlands and shorelines, and the quality of its environment and natural scenic beauty, and to encourage the conservation of its agricultural lands. In implementing this policy, the County Legislature shall make adequate provision for the abatement of air, water and soil pollution and of excessive and unnecessary noise, the protection of wetlands and shorelines, and the conservation and regulation of water resources. | Establishes the Suffolk County Council on Environmental Quality (CEQ) and assigns them the following responsibilities:<br>1. Prepare guidelines on what activities are likely to have a significant impact on the environment.<br>2. Recommend properties for dedication to the County Nature Preserve and Historic Trust.<br>3. Assist the County Executive in the preparation of his Annual Environmental Reports.<br>4. Advise the County Legislature and County Executive on developments in the County with environmental significance.<br>5. Review the environmental impact of any project at the request of the County Legislature or County Executive.<br>6. Review and report on environmental impact statements that are required to be prepared by County agencies. In addition, all projects and activities undertaken by the county that may significantly affect the environment were required to undergo environmental review. |
| Local Law No.22-1985, A Local Law Implementing SEQRA | County Executive, Legislature, Council on Environmental Quality and all Departments initiating county projects and actions | Implementation of the State Environmental Quality Review Act at the County level. | 1. Sets County rules and provisions for environmental review of county actions.<br>2. County Legislature and Executive responsible to make all final SEQRA determinations.<br>3. CEQ is in charge of administering the environmental review process.<br>4. Departments are in charge of preparing environmental impact assessments and statements. |

Also at Blydenburgh during 1987, the Blydenburgh-Weld House was opened as a park Visitor Center and the restoration of scenic vistas known to have existed from the house during the historic period was continued. The park was the site of the quarterly meeting of the Association of Suffolk County Historical Societies which passed a resolution commending the preservation efforts of Suffolk County government during the past several years. This was particularly significant since ten years earlier the same organization had unanimously condemned Suffolk County's administration and maintenance of county-owned historic buildings, particularly at Blydenburgh Park.

*MEADOW CROFT -*

The former John E. Roosevelt estate in Sayville was the scene of intensive restoration activity during 1987. While the Roosevelt mansion was stabilized in 1986 with the replacement of the roof, major reconstruction of the foundation, porches and porte cochere continued in 1987. Design plans for the replacement of all building mechanical systems and a new water service was also completed. Once these improvements are accomplished, the Bayport Heritage Association and Friends for Long Island's Heritage will begin the interior restoration program.

The carriage house at Meadow Croft, targeted for restoration in 1990 suffered a partial collapse during the month of December and will require demolition or reconstruction. Original blueprints discovered the same week as the structure's collapse confirm that the carriage house was designed by Issac Henry Green, Long Island's most prominent 19th century architect in 1891. These facts convinced New York State officials to appropriate $75,000 for the structure's restoration, with funds provided by the *Environmental Quality Bond Act of 1986* (EQBA). Meadow Croft was also listed on the National Register of Historic Places during the past year.

*ELIJAH TERRY HOUSE -*

During the early months of 1987 the Elijah Terry House, an 1820 cape-style dwelling that was home to central Brookhaven's first school teacher, was moved adjacent to the 1850 Bald Hills School, to make way for the widening of County Route 16. The structure and schoolhouse, now on county property donated by the Farmingville Reunion Association, will be restored with the assistance of the Friends for Long Island's Heritage.

*HALLOCKVILLE -*

During August of 1987 the Suffolk County Legislature authorized accepting the historic farm property known as Hallockville, which will now be administered jointly by Suffolk County and Hallockville, Inc. through a contractual agreement. A proposal by the county to establish a linear farm museum at the site, using eleven separate but contiguous farmsteads was submitted and is being considered by the Long Island Lighting Company, which still owns the tract. The goal of the museum would be to interpret 300 years of architecture, domestic life and agriculture in Suffolk County at one location.

*HAWKINS-JACOBSEN HOUSE -*

Yaphank's Hawkins Homestead was the setting in early June for the dedication of a Victorian garden, donated by the Yaphank Historical Society in memory of Wallace Stroud. Mr. Stroud, a society member whose efforts largely resulted in the restoration, rather than the demolition, of the county-owned historic site in 1976. The carriage house at Hawkins also was the recipient of a $22,500 EQBA grant for restoration in September.

*THE BIG DUCK -*

Perhaps the most publicized preservation project in the history of Long Island was Suffolk County's successful proposal to preserve the famous *Big Duck* of Flanders, America's premier example of roadside architecture. Threatened with relocation to a remote site by its owners, the unique structure was donated to the County of Suffolk in December 1987 for preservation as an historic landmark. The *Big Duck's* international prominence and popularity was highlighted by the four mile gala parade which accompanied its move to Suffolk County parkland. A $50,000 *Big Duck Preservation Fund* is now being developed by the Friends for Long Island's Heritage to support interpretive exhibits and programs about the structure. A proposal to establish an outdoor museum highlighting Long Island's roadside culture and its relationship to the development of highway travel in the United States is also being explored.

Efforts by the Historic Services Division to expand public awareness and support for the county's historic structures also continued during 1987. In addition, *the Friends for Long Island's Heritage*, a non-profit educational organization with over 10,000 members, has continued to support the historic preservation programs of both Nassau and Suffolk County governments. The Friends raise funds, develop collections and add supplemental support to dovetail with county efforts at specific sites at no cost to county taxpayers. These efforts not only provide significant resources to the counties, but also serve to promote the regional identity of Long Island and a spirit of cooperation between the county governments.

One innovative program administered by the Friends for Long Island's Heritage under a contract with Suffolk County is the *Landmark Preserve Program*. This program, which was enlarged in 1987 with the addition of three new units, licenses to the Friends certain county-owned historic structures, such as gatehouses and cottages in county parklands, which have been determined by the Historic Trust to have no direct public use but whose retention adds to the ambiance of parks and preserves. The Friends restore and maintain the structures and relicense them to county-approved tenants with the rents used to supplement building maintenance and interpretive programs at county historic sites. The tenants provide incidental security to the parkland and the buildings themselves become self-sustaining.

The Historic Services Division continued to fulfill the requirements of the County Historian during 1987 including providing various public history services such as community outreach, research and environmental review regarding historical or archaeological sites. These services, which have increased dramatically during the past few years traces the increasing interest in local history and historical preservation in Suffolk County.

***Office of Ecology***

Local Law No. 837-1986 created the Office of Ecology within the Department of Health Services. The main purpose for establishing the new office in the Division of Environmental Quality was to expand the county's commitment to the environment. This commitment was to be fulfilled by broadening the authority of DHS beyond strictly public health related issues. There are two bureaus within the Office of Ecology: *Environmental Management* and *Marine Resources*.

The Bureau of Environmental Management is responsible for water pollution control studies, SEQRA, environmental education, investigations of fresh surface water and upland and wetland natural resources, and conservation programs. During 1987, this bureau, with the assistance of a consultant, began work on a water pollution control study entitled *Wastewater Management Plan - Portion of North Central Brookhaven*--(see *GROUNDWATER - STUDIES AND PROGRAMS* Most of the staff time was devoted to the expanded role in SEQRA. As part of the review activities, natural resources protection issues were addressed in addition to traditional sanitary code requirements.

Environmental review pursuant to the State Environmental Quality Review Act (SEQRA) changed dramatically within the Department of Health Services in 1987 with the formation of the new Office of Ecology. Expanding review beyond sanitary code concerns, Bureau of Environmental Management staff examined projects for environmental concerns such as wetlands, drainage and erosion, special plant communities, and species of distinction. Among the species of distinction addressed in this year's reviews were birds, such as the *northern harrier* (threatened), *osprey* (threatened), *least tern* (endangered), *piping plover* (endangered), and *grasshopper sparrow* (special concern); reptiles, such as the *eastern mud turtles* (threatened); amphibians, such as the endangered *eastern tiger salamander*; insects, such as the *buck moth* (special concern); and plants, such as the *Atlantic white cedar* and the rare *bushy rockrose*. Staff gave full natural resources and sanitary code review to over 100 projects. Another 250 projects were examined by Environmental Management staff for sanitary code concerns only. In all cases SCDHS sent comments to the lead agencies for their use in determining environmental significance and deciding approvals.

Through the ex-officio standing of the SCDHS on the County's Council on Environmental Quality, Bureau of Environmental Management reviewed and sent comments on over 37 Capital Programs projects. Field inspections and natural resources commentary by Environmental Management staff supplemented these environmental reviews of county projects. In one case, staff cooperated with the Department of Public Works in completing a terrestrial ecology description section of a DEIS being prepared for a road improvement project, CR 100 (Suffolk Avenue). In another case, staff conducted a natural resources inventory of the Great Bog, north of Lake Ronkonkoma, for a Final EIS being prepared by CEQ.

A report by the County Executive's Office in 1986 titled, *Enhancement of Suffolk County's Environmental Program,* stated:

> The effectiveness of Suffolk County's environmental programs must be supported by active community education programs. Community awareness on environmental issues must be brought to the forefront and special emphasis placed on public information. Specific goals would include the development of a community awareness program on environmental topics directly related to wildlife and vegetation, and the development of a working relationship with environmental groups and civic associations.

The Office of Ecology was created in 1986 in part to meet these goals. In the Division of Environmental Quality, Department of Health Services, the new Office of Ecology works with an advisory group, *Advisory Council for the Environment* (ACE), made up of representatives of various environmental organizations throughout Suffolk County. The ACE relationship with Health Services has improved communication between the county and nonprofit as well as other governmental organizations involved in environmental protection and education.

The Office of Ecology conducted an environmental education survey during January and February 1987. The survey was accomplished by sending a questionnaire prepared by the Office of Ecology staff to 103 groups involved in environmental education and examining the answers provided in the 46 questionnaires returned. Additional information was gained through interviews with 14 environmental educators currently running programs in Suffolk County. The major objectives of the questionnaire were to:

1. gain a more thorough understanding of the environmental education programs offered in Suffolk County;
2. pinpoint gaps in environmental education in Suffolk County;
3. provide a tool for the Office of Ecology in formulating its own environmental education program.

The results of the questionnaire show that there are a variety of environmental education programs now available in Suffolk County. The subject of ecology is the most often covered topic followed by environmental issues and tours of nature preserves.

The survey supported the belief that there are definite gaps in the programs now offered in the county. Survey results attest to the widely discussed need for more education programs aimed at the general public and brought out the ongoing concern for the lack of environmental education programs in this area. In addition, the survey brought out the ongoing concern for the lack of environmental education programs in school curriculums. The participants in the survey also voiced the need to promote public awareness on environmental issues and the need for more cooperation between organizations.

A report on the results of the questionnaire was prepared. Using the report as a guide, the Office of Ecology plans to establish an environmental education program that will address some of the needs of the citizens of Suffolk. In addition, the report may serve as a useful tool to other organizations involved in environmental education in the modification of current programs and the planning of new ones.

The Bureau of Marine Resources is responsible for marine water, recreational water, shellfish and finfish monitoring and protection programs, and meteorology. The major activity in 1987 of this bureau was the extensive monitoring of the Flanders-Peconic Bay system for the Brown Tide which devastated the scallop crop. A proposal was prepared and submitted to the NYSDEC requesting Sec. 205(j) grant funds necessary to conduct a study entitled *Brown Tide--Comprehensive Assessment and Management Program.* Monitoring also continued to investigate the possible occurrence of Red Tide in east end waters (see *MARINE ENVIRONMENT --ALGAL BLOOMS*).

***Pine Barrens Review -***

The Suffolk County Pine Barrens Review Commission (PBRC) reviews applications within the Pine Barrens Zones as shown in Figure 3. During the 1987 year, the Suffolk County Pine Barrens Review Commission (PBRC) reviewed 224 applications, a slight increase over 1986. As in previous years, the largest number of applications were received from the Town of Brookhaven (83) although the Town of Southampton was a close second with 71. Table 40 summarizes the applications by municipality and category.

**TABLE 40**
**Number of Applications Reviewed by the Suffolk County Pine Barrens Review Commission**

| Town or Village | Total Applications | Sub-Division | Rezoning | Var. | Special Permit | Code Amend. | Other* |
|---|---|---|---|---|---|---|---|
| Brookhaven (T) | 83 | 32 | 26 | 8 | 2 | 9 | 6 |
| East Hampton (T) | 50 | 21 | 0 | 13 | 7 | 6 | 3 |
| Quogue (V) | 7 | 1 | 0 | 0 | 0 | 6 | 0 |
| Riverhead (T) | 12 | 6 | 0 | 2 | 1 | 1 | 2 |
| Southampton (T) | 71 | 35 | 0 | 20 | 8 | 5 | 3 |
| Westhampton Beach (V) | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| **TOTAL:** | **224** | **95** | **26** | **43** | **18** | **28** | **14** |

*No jurisdiction, incomplete, duplicate, or no action.

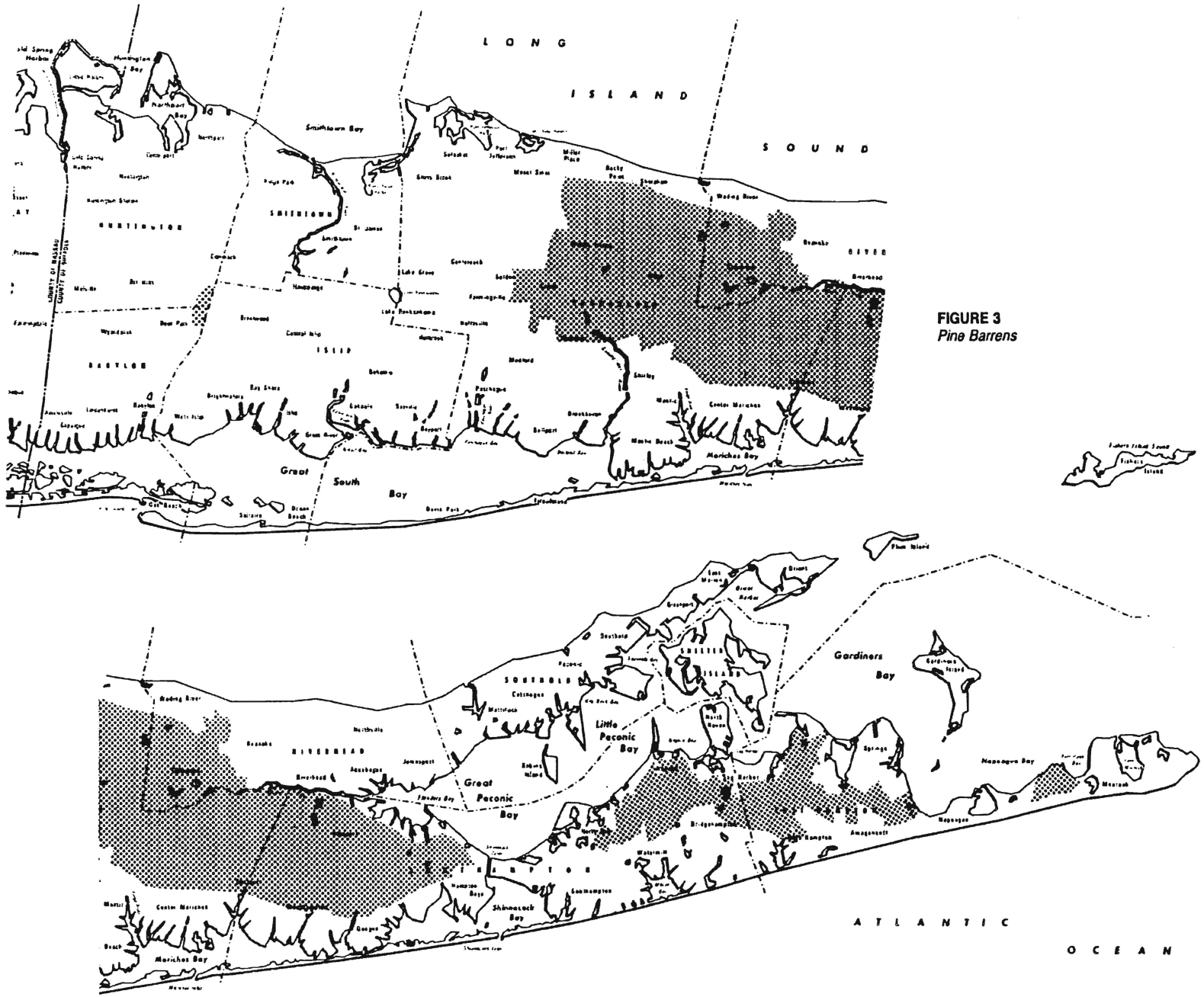



**FIGURE 3**
*Pine Barrens*

This table shows that requests for subdivision approval are more numerous than any other type. Requests for variances are next in frequency. Variances, special permits, and code amendments are most likely to be processed as Level I reviews and returned to towns for local determination. The numbers indicate that all of the rezoning requests in 1987 involved properties in Brookhaven.

While there were more applications received in 1987, the total acreage and potential number of dwelling units was less than in 1986. Table 41 is a comparison of applications reviewed by the commission during the past three years.

**TABLE 41**
**Comparison of Application Reviewed by Pine Barrens Review Commission (PBRC) 1985-1987**

| Year | Applications | Acres | Potential Units |
|---|---|---|---|
| 1985 | 71 | 3,332 | 3,437 |
| 1986 | 159 | 5,128 | 4,463 |
| 1987 | 224 | 4,061 | 3,989 |

The moratorium in Brookhaven affected the overall activity in the Pine Barrens Zone(s). In 1985, the number of applications submitted to the PBRC for Brookhaven was 34; in 1986, the number was 93; and in 1987, only 83. Land subdivision applications, which account for the greater portion of the development activity in the Pine Barrens towns, declined as a percentage of total applications, from 67% in 1985 to 55% in 1986 and 38% in 1987. During the three year period, Brookhaven sent 23, 51 and 32 subdivisions for 1985, 1986 and 1987 respectively.

In the other two South Fork towns, Southampton and East Hampton, subdivisions represented 52% and 42%, respectively, of the Pine Barrens development activity. The moratorium in Brookhaven appears to have had a rather noticeable effect.

The commission members have found that by reviewing subdivisions at the preliminary stage, they are more likely to have a positive influence on subdivision design. All applicants that followed the recommendations of the Town Committee were approved at final submission and conversely all that ignored the recommendations were disapproved.

An analysis of Table 41 shows that more than 4,000 acres might be developed if all applications were approved by the Pine Barrens Review Commission, by the Suffolk County Planning Commission and ultimately by each town. This table provides an indication of the extent of the developmental pressures affecting the Pine Barrens and should not be construed as an indication of what may be ultimately built. The Pine Barrens Review Commission is only one step in a lengthy review process taking several years in most cases. Many applications are at the preliminary stage and are submitted voluntarily by towns for comments early in the review process. Preliminary reviews in 1985 and 1986 averaged four (4) per month. In 1987 the average was close to three (3) per month, a further indication of the possible effects of the moratorium.

Although the vast amount of applications deal with residential subdivisions, not all requests for subdivision review concern residential development. Under certain conditions commercial and industrial development is possible in the Pine Barrens. Table 42 shows the relationship between commercial/industrial subdivisions involving 258.6 acres and residential subdivisions involving 3,255.6 acres within the Pine Barrens.

Potential dwelling units and associated increases in population may come from sources other than subdivision applications. Subdivision applications represent the source for approximately half of the potential dwelling units. The other half appears to come from zoning, variance, and special permit requests.

Other legislation that may affect the Pine Barrens Review Commission includes the proposed extension of the 1/4 cent sales tax and the newly enacted code of ethics. The county's effort to provide funding to purchase permanent open space for watershed protection could preclude the development of particularly sensitive parcels thereby preserving groundwater resources. The commission went on record in support of Proposition No. 2 in October 1987.

Throughout the year the Pine Barrens Review Commission provided developers with an opportunity to present and discuss their proposals at an early stage in the design process. A two-fold benefit was derived as

1. the developer was able to receive environmental input before vast amounts of design-time and money were spent,
2. commission members were introduced to all phases of a project so that when submissions were transmitted from the towns - sometimes in several separate phases - a comprehensive picture was available.

Occasional applications involving horse farms have led to research towards developing standards for minimizing associated environmental impacts. Calculations have been made relating nitrate loading from animal husbandry and from residential development. A correlation equates one horse to eight people. Visually, a horse farm becomes a bucolic statement of rural serenity and peace. The effects on the groundwater may be quite different unless horse farm populations and their wastes are carefully regulated. Other agricultural uses and the effects of pesticides and fertilizers on groundwater is an emerging field needing research.

Brookhaven's Master Plan Update advocates the use of *Transfer of Development Rights* (TDR) as a mechanism to preserve open space, a concept endorsed by the Pine Barrens Review Commission. This concept has been proposed several times, but the commission has yet to review its first proposal within an application. Research done by PBRC staff found that TDR has been used in other parts of the county.

In May the commission heard a presentation of the East Hampton Water Resources Management Plan.

The information bulletin of the education committee, The Pine Barrens Reviewer, was issued twice during the year.

In 1987, the commission also requested reports from the towns so that the final disposition of applications in the Pine Barrens would be known. Such reports are required by Article XIV of the County's Administrative Code. East Hampton's and Southampton's Zoning and Planning Boards regularly send copies of resolutions which they enact. Notification is sent to Brookhaven regarding rezoning applications. These are summarized and reported at commission meetings, then filed as part of each application's record.

A major goal has been to improve the relationship between the towns and the commission. Maps showing existing and potential Pine Barrens development together with suggested open space were prepared by planning staff for Brookhaven, Riverhead, Southampton and East Hampton. The maps were presented to both the Pine Barrens Review Commission and to the Suffolk County Planning Commission, and copies sent to the towns. Potential open space linkages were outlined so that future cluster development could be coordinated to preserve natural areas to the fullest extent.

**TABLE 42**
**Proposed Actions: Number of Acres Involved by Type of Proposal and Municipality**

| Town or Village | Total Number of Acres Involved | Acres in Residential Subdivisions | Acres in Commercial/ Industrial Subdivisions | Acres Affected by Rezoning | Acres Affected by Variances | Acres Affected by Special Permits | Acres/Other |
|---|---|---|---|---|---|---|---|
| Brookhaven | 1845.19 | 1184.8 | 217 | 391 | 36.3 | .09 | 16 (DEIS) |
| East Hampton | 1102.63 | 1051.2 | 13.6 | 0 | 19.2 | 14.33 | 4.3 (DUAL)* |
| Quogue | 8 | 0 | 8 | 0 | 0 | 0 | 0 |
| Riverhead | 82.7 | 80 | 0 | 0 | 2.7 | 0 | 0 |
| Southampton | 1022.48 | 939.6 | 20 | 0 | 57.04 | 5.84 | 0 |
| Westhampton B. | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Acres** | **4061** | **3255.6** | **258.6** | **391** | **115.24** | **20.26** | **20.3** |

*Variance & Special Permit
Number of Acres reviewed by Brookhaven Zoning Board of Appeals is not known.
Source: PBRC 1987

A review of Brookhaven's Master Plan Update was coordinated through the staffs of the town and of the two county commissions (Planning and Pine Barrens). A massive job was reviewed and the concept of up-zoning was commended. A similar process, though on a smaller scale, was coordinated with the Town of Riverhead. A presentation on Riverhead's Floating Zone was given in May.

The towns are sending the Pine Barrens Review Commission *Draft Environmental Impact Statements* (DEIS) more and more frequently. If a project falls within the Pine Barrens Zone, the staff tries to review the DEIS with respect to standards and criteria which the commission has adopted. Comments are returned to the towns.

The Suffolk County Department of Health Services, Office of Ecology is sending comments which become a part of the PBRC record of each application. If notice is seen in the N.Y.S. Department of Environmental Conservation Environmental Notice Bulletin, or if a notice is received from the Suffolk County Health Department, these items also are filed. Suffolk County Planning Commission comments are also included. All these documents and the information contained provide a comprehensive record of each project reviewed.

Most of the applications initially classified as incomplete by PBRC staff are eventually processed as new material is received. Very few are held over. A follow-up contact will frequently be made, when, after a notice of incomplete application has been sent to the town a long time elapses without the arrival of additional material.

Where an application cannot be reviewed by the Suffolk County Planning Commission, because it has not been reviewed by the Pine Barrens Review Commission, a letter is sent to the referring town and a copy of the letter is filed with the PBRC. Thirty of these letters are on file for 1987. Brookhaven, East Hampton and Southampton have four each, while Westhampton Beach has six and Riverhead has twelve. Duplicate referrals should always be made to the PBRC and the SCPC. Coordinated review is likely to run more smoothly.

***Environmental Crime Unit -***

The Environmental Crime Unit of the Suffolk County District Attorney's Office investigates alleged violations of various state and county laws that have been enacted to protect our environment, and, in particular, our groundwater, from the unlawful disposal of industrial and hazardous wastes. If the allegations can be proven, the District Attorney will bring appropriate charges against the company and/or individual responsible.

The unit at present consists of one Assistant District Attorney, one Detective Investigator and one District Attorney Investigator. The unit received many of its leads, regarding polluters, from disgruntled or ex-employees of commercial firms, from Health Department and Town Environmental Inspectors, the County Police Department, as well as from local citizenry.

The initial leads may result in the unit obtaining a Search Warrant for the procurement of chemical samples and other evidence. These raids involve members of the Environmental Crime Unit, with technical assistance provided by the Suffolk County Department of Health Services Inspectors and Lab personnel, by the Suffolk County Police Emergency Services Unit and State Conservation Officers.

In 1987 the unit obtained eight search warrants. There were nine criminal convictions and $107,000 in fines were imposed. $102,000 of these fines went to the New York State *Hazardous Waste Remedial Fund* for cleanup of abandoned hazardous waste sites within the state.

The following is a summary of cases handled by the Environmental Crime Unit for the period covering January to December, 1987.

- *Astro Electro Plating*, Farmingdale. Electro-Plating waste being discharged to hidden below ground pools. On 6/16/87, the corporation pled guilty to *Unlawful Disposal of Hazardous Waste in the 2nd Degree*, an **E** Felony. $50,000 fine.

- *B-Ram Corporation*, West Babylon. Drums containing hazardous waste emptied into a storm drain. On 9/17/87 the corporation pled guilty to *Industrial Waste Discharge Without a Permit*, an **A** misdemeanor. $2,500 fine.

- *Rite Off, Inc.*, Bay Shore (Search Warrant). Methylene Chloride Solvents discharged to storm drain. On 10/13/87, the corporation pled guilty to *Endangering Public Health, Safety, the Environment* in the Third Degree, an **E** Felony. $50,000 fine.

- *Robert Mashman*, 30 Intervale Rd., Setauket. Construction debris and refuse dumped in woods from the defendant's dumptruck. On 3/27/87, subject pled guilty to *Unlawful Disposal of Offensive Material*, an **A** misdemeanor. $1,500 fine.

- *Thomas McCann*, Lake Ronkonkoma. On 5/27/87 subject's corporation pled guilty to *Unlawful Disposal of Noisome Material*, a *B* misdemeanor. $250 fine.

- *Kevin Allen*, N. Babylon. Construction debris dumped in the woods from the defendant's truck. On 5/27/87, subject's corporation pled guilty to *Unlawful Disposal of Noisome Material*, a *B* misdemeanor. $250 fine.

- *Brian Jahrsdoerfer*, Melville. Construction debris dumped in woods from defendant's truck. On 6/19/87, subject's corporation pled guilty to *Unlawful Disposal of Noisome Material*, a *B* misdemeanor. $250 fine.

- *Joseph Guida & Sons Trucking Corp.*, Lake Ronkonkoma. Construction debris was dumped in the woods from the defendant's truck. On 9/3/87, corporation was found in default (Failure to Appear) of ECL 71-3501, a *B* misdemeanor. $250 fine.

- *Jack Campo Enterprises*, Setauket, New York. A fuel oil tank emptied onto ground. On 11/9/87, corporation pled guilty to *Industrial Waste Discharge*, ECL 71-1711, an *A* misdemeanor. $2,000 fine.

- *Touch of Class, Inc.*, West Babylon. Chemical discharges from a multi-tenant building. 9/24/87 search warrant executed and corporate records subpoenaed. Investigation continues.

- *Mr. Vin's World of Prints*, West Babylon. Chemical discharges. 9/24/87 search warrant executed and corporate records subpoenaed. Investigation continues.

- *Lamar, Inc.*, West Babylon. Chemical discharges from a multi-tenant building. 9/24/87 search warrant executed. Case closed; subject found not to be source of pollution. Another source was identified.

- *Scott Shafiroff Racing Enterprises*, West Babylon. Chemical discharges from a multi-tenant building. 11/4/87 search warrant executed and corporate records subpoenaed. Investigation continues.

- *Systematic Impressions, Inc.*, West Babylon. Chemical discharges from a multi-tenant building. 11/4/87 search warrant executed. Case closed, subject found not to be the source of pollution. Another source was identified.

- *Camelot Images, Inc.*, East Setauket. Abandonment of 3,000 gallons of chromic acid. 11/24/87 search warrant executed and corporate records subpoenaed. Investigation continues.

- *Joseph Lalota*, Farmingdale. Approximately 95 abandoned drums of chemicals found in a trailer. The investigation continues, the suspect resides out of state.

- *Richmond Avenue*, Lindenhurst. Thirty-nine gallons of pesticide abandoned. Investigation continues.

- *T & S Metals, Inc.*, Deer Park. Drums of chemicals and cyanide waste were abandoned in a building. Search warrant executed 12/17/87. Investigation continues.

With respect to Suffolk County's efforts in this area, the 1988 conference on the Criminal Enforcement of the Hazardous Substance Laws, sponsored by the Joint Legislative Commission on Toxic Substances and Hazardous Wastes, and the New York Bar Association did report, in its listing of environmental cases prosecuted, that the Suffolk County District Attorney's Office accounted for 20 percent of all environmental cases successfully prosecuted in New York State for the years 1983-1987.

***Radiation -***

The Radiation Control Unit of the DHS is responsible for the inspection of all diagnostic x-ray facilities within the county. At the end of 1987 there were 1,490 x-ray facilities with 2,870 x-ray machines, representing a four percent increase from the prior year. The interval of inspection for these facilities varies from one to three years. During 1987 there were 620 facility inspections, 1,270 x-ray machine inspections and 320 facility reinspections. The federally required D.E.N.T. program involved the survey of 660 dental x-ray machines. Fees collected approximated $63,000.

A 21% increase in facilities over the past five years and the increase in the technical aspect of each inspection has resulted in a four month delay in facility surveys. A program was adopted whereby all annual facilities have been given priority of inspection due to their relative complexity and heavy radiation workload. Consequently all such facilities, comprising hospitals, radiologists and clinics, have been surveyed on a timely basis for 1987.

In 1987 the *New York State Bureau of Environmental Radiation Protection* promulgated a program of quality assurance for providers of mammography. The program, similar to that implemented for hospitals four years ago, requires the facility to evaluate and retain records of patient dose, processing, phantom imaging and x-ray equipment performance. The Radiation Control Unit performs an annual audit to determine that the program is effective in keeping patient dose low and imaging quality high. Presently there are 36 providers of mammography in the county that are to be audited. Training provided by New York State Bureau of Environmental Protection was required to familiarize inspectors with the components of the audit and new survey techniques. The program comes at a time when there is heightened public awareness of mammography's benefit in early detection of breast lesions.

Regulations concerning the discharge of x-ray processing solutions and rinsewater were placed into effect during the year by the Solid Waste Section. The regulations are applicable to the 1,490 x-ray facilities registered county-wide. The Radiation Control Unit commenced official written notification to each facility operator during scheduled New York State Sanitary Code - Part 16 compliance inspections.

Sample collection on behalf of the New York State Health Department and the Environmental Protection Agency continued throughout the year. Approximately 296 radiation samples were collected and submitted to the appropriate agency for analysis of gross beta and gamma radiation.

Hospital Quality Assurance Audits is an ongoing program. Each of the sixteen hospitals was audited during 1987. The effectiveness of quality assurance has become apparent in the decreased number of equipment violations found at some facilities during inspections. The less tangible, but no less important, result of quality assurance is reduced radiation exposure and increased image quality.

**2. Local**

All 10 towns within Suffolk County, as well as the Villages of East Hampton, Sag Harbor, Head of the Harbor, Northaven, Lindenhurst and Northport, have local SEQRA ordinances. The Towns of Babylon, Brookhaven, Huntington, Islip and Smithtown also have environmental departments which aid their towns in environmental review of projects, as well as enforce their towns environmental laws.

In addition to projects and activities initiated by the municipalities themselves, the towns and villages within Suffolk County review hundreds of projects and activities related to proposed development as part of their planning and site plan review processes. Table 43 shows the types of permits that may be required during the site plan review process of a proposed land use project. As stated previously, environmental concerns as required by SEQRA have become increasingly important at the local level and most municipalities have incorporated them into their planning and site plan review processes. Figure 4 illustrates a town site plan review process incorporating SEQRA.

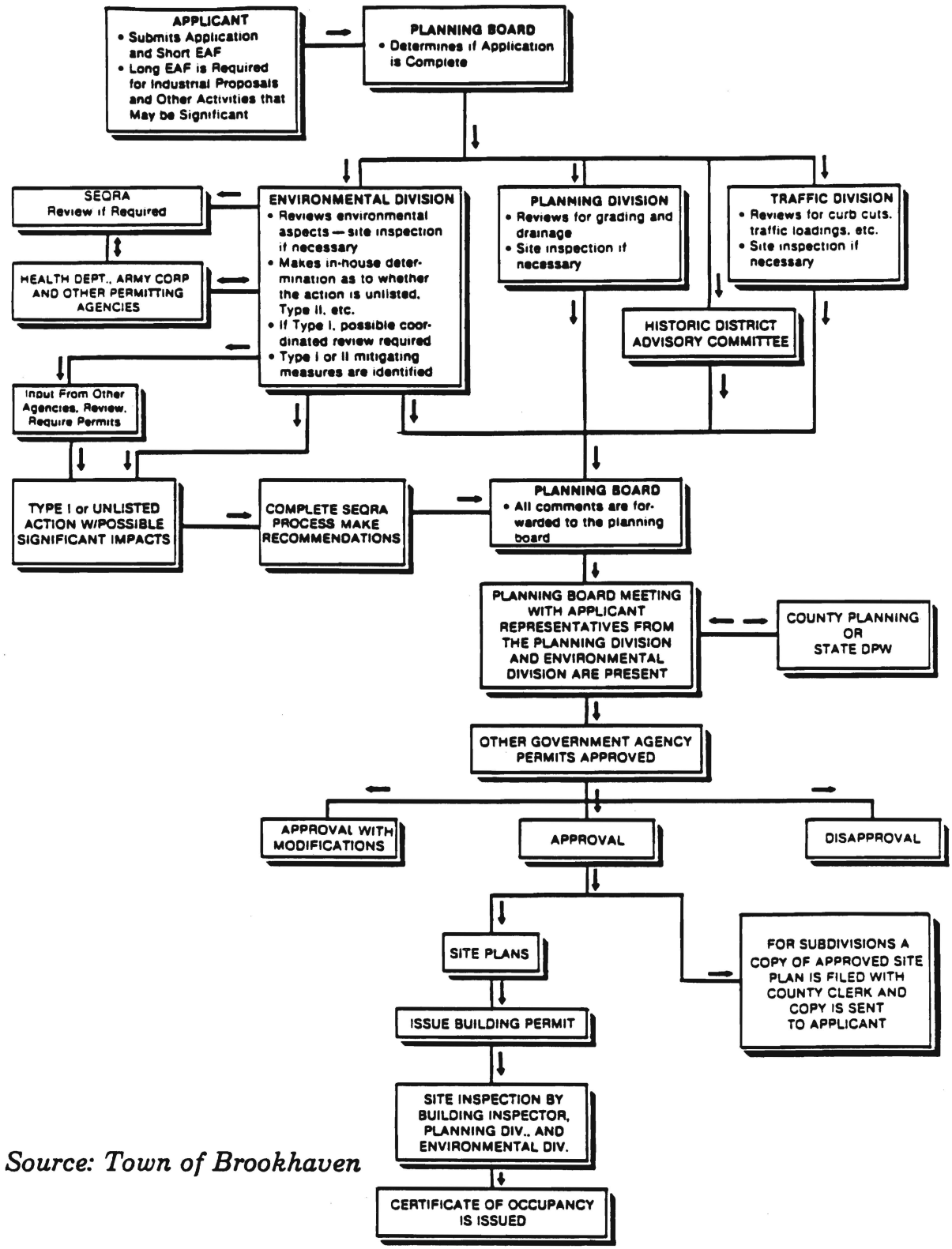
The New York State Department of Environmental Conservation office in Albany records SEQRA determinations filed with them by the various municipalities and agencies throughout Suffolk County. During 1987, 675 negative declarations (actions requiring no environmental impact statements) were issued within the towns for Type I and unlisted actions. Likewise, 136 positive declarations (actions requiring preparation of an environmental impact statement) were issued within the towns during 1987.

Also at the local level, Suffolk County has a total of 19 Conservation Advisory Councils (CACs) which have been duly authorized by the New York State Department of Environmental Conservation (NYSDEC). The municipalities of Babylon, Brookhaven, East Hampton, Huntington, Islip, Riverhead, Shelter Island, Smithtown, Southampton, Southold, Asharoken, Brightwaters, Head of the Harbor, Lloyd Harbor, Nissequogue, Old Field, Port Jefferson, Village of the Branch and Westhampton have CACs. All of the CACs play a direct role in the SEQRA review process in their respective towns and villages giving environmental advice, and are asked to send representatives to the Suffolk County Council on Environmental Quality.

## TABLE 43
## Permits Required for the Site Plan Review Process

| Action | Permit Required | Agency | Authority |
|---|---|---|---|
| Project area on or within 100 feet of a freshwater wetland or freshwater body of 12.4 acres or larger (Town regulations may be more stringent) Project involving draining, dredging, filling, excavating, erecting structrures, roads, utilities or other alterations or placing any form of pollution in a wetland. (Consult the Regional Environmental Assessment Unit at 516/751-7900 if unsure) | Freshwater wetland | NYSDEC (Authority may be delegated to the municipalities) | ECL Article 24; 6 NYCRR Parts, 662 and 663 |
| Project changing, modifying or otherwise disturbing the course, channel or bed of any stream classified C(T)[1] or higher. | Protection of Waters Permit | NYSDEC (Towns also have permits or review) | ECL Article 15; Title 5: 6 NYCRR Part 608 |
| Project involving the temporary or permanent artificial obstruction of a natural stream or watercourse | | | |
| Project involving the construction or repair of a permanent dock, pier or whar having a top surface area more than 200 square feet. | | | |
| Project involving any excavation or placing of fill in the navigable waters of the State and adjacent wetlands. | | | |
| Future restricted activities within the boundary area. | Wild, Scenic and Recreational Rivers Permit | NYSDEC (Towns) | ECL Article 15; Title 27 Regulations have not yet been adopted |
| Acquisition, conservation, development or use of land or construction of facilities for water supply or distribution purposes | Water Supply Permit | NYSDEC (or County) | ECL Article 15; Title 15: 6 NYCRR Parts 601 and 602 |
| Construction of new well or deepening or increasing capacity of an existing well to withdraw water at rate greater than 45 gpm<br>or<br>if project will lower groundwater levels for construction purposes. | Well Permit | NYSDEC | ECL Article 15; Title 15: 6 NYCRR Part 602 |
| Project located in tidal waters or within 300 feet of either the landward edge of a tidal wetland boundary or a tidal body of water | Tidal Wetlands Permit | NYSDEC (Towns) | ECL Article 25; 6 NYCRR Part 661 |
| Any subdivision of land or physical alteration of land or water. | | | |
| Exemptions to the above regulated locations if<br>- Project will be located at a ground elevation of 10 feet or higher above mean sea level (excepting on the face of a bluff or cliff).<br>- A substantial, manmade structure (such as a paved street or bulkhead) 100 feet or longer exists between the project site and tidal wetlands or tidal water. | | | |
| Any quantity of industrial waste | SPDES | NYSDEC (County | |
| Industrial hazardous waste greater than 1,000 kg/month | Part 360 Article IX NCDH Code<br>Article 12 SCH Code | Health Departments<br>Municipalities (Zoning) ) | |
| Mining of greater than 1,000 tons of mineral within a 12 calendar month period | Mining Permit | NYSDEC (Towns) | ECL Article 23; Title 27; NYCRR Parts 420-426 |
| Construction or modification of facilities (such as highways, stadiums, large shopping centers and parking lots) which, by generating significant traffic, may contribute to air quality deterioration. | Permit to Construct Indirect Sources | NYSDEC (Towns) | ECL Article 19; 6 NYCRR Part 108 |

[1]The best usage of class C waters are fishing, propogation, survival and growth of fish, other aquatic life and wildlife, secondary contact recreation. "C" waters are not used as a source of water supply or for swimming. "T" represents waters suitable for trout habitat and spawning areas.




*Source: Town of Brookhaven*

**FIGURE 4**
*Site Review Process Incorporating SEQRA Action*