LONG ISLAND REGIONAL PLANNING BOARD

Long Island Comprehensive Waste Treatment Management Plan

Volume II: Summary Documentation

THE LONG ISLAND COMPREHENSIVE WASTE TREATMENT MANAGEMENT PLAN

VOLUME II: SUMMARY DOCUMENTATION

LEE E. KOPPELMAN
Project Director

July 1978

NASSAU-SUFFOLK REGIONAL PLANNING BOARD

Hauppauge, New York

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*****replaced Francis T. Purcell 1/1/78
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*replaced Arthur Koerber 9/1/77
**replaced Theodore Burger 1/1/78
***replaced Philip DeGaetano 7/1/77

Other Study Participants

Nassau County Department of Health
Francis V. Padar
Sheldon O. Smith
Maxim Lieber
Michael Alarcon
Stanley Juczak

Nassau County Planning Department
Robert O. Berry
John W. Follis
William G. Turner

Nassau County Department of Public Works
Steven A. Fangmann
Francis J. Flood
James S. Gillen

Suffolk County Department of Environmental Control
Joseph Baier
Steven Cary
John Frizzola
Ellis Koch
Robert Nuzzi
Sue Quinn
Ben Wright

Suffolk County Department of Health Services
Herbert Davids
Paul Grosser
Keith Jensen
Dennis Moran
John D. Wirenius
Mahfouz Zaki, M.D.

Suffolk County Water Authority
Jack B. Graham
William J. Schickler
Louis W. Weinfurt

208 Consultants

Edward Beltrami
Brookhaven National Laboratory
T. Owen Carroll
Cooperative Extension Association of Suffolk County
Delta Well Company, Inc.
Energy Resources Company, Inc.
Geraghty & Miller, Inc.
Malcolm Hair
Town of Islip
Princeton University
Suffolk County Soil & Water Conservation District
Tetra Tech, Inc.
Roy F. Weston
Woodward-Clyde Consultants
United States Geological Survey

Administration and Report Preparation

DeWitt Davies
Teresa Dowd
Arthur Kunz
Catherine Morrison
Sy Robbins
Fred Rosenberg
Carol Swick
Edith Tanenbaum
Ronald Verbarg
Michael Volpe
Burton Weinstein
Israel Wilenitz

Clerical Staff

Joyce Barsky
Deborah Ann Courtney
Paula Davantzis
Keri Grattan
Edith Jones
Mary Jane Korwan
Eileen Retzger
Dolores Truglio

Accounting

Lucille Gardella

Cartographic

Anthony Tucci

Typography

Ariel Graphics

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Daniel Martinez	Local 138 Operating Engineers
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Newsday Photo

Foreword

Water, life's ultimate indispensible mineral, is no match for its greatest enemy, man. But man's victory is hollow.

"Mommy, my toothbrush tastes funny." This scene could be early morning in Levittown, Lynbrook or Port Jefferson, as a typical Long Island family prepares to begin another day. The circumstances along with others similar in consequence could become reality in the absence of the comprehensive water quality management program contained in this multi-faceted work. Even with this document, they might come to pass. The program only shows the way. Unless implemented, toothbrushes may indeed begin to taste funny and surface waters, commercially and recreationally, may become endangered hydrological species. In this brief context—citing hazards but knowing they can be eliminated—I write this introductory segment with utmost pride. This work, in my opinion, represents excellence unusually distinctive in quality, a demonstration of a public agency's ability to create, produce and execute at the highest level of competency.

Long Island possesses rich and unusual natural bounty: white and pebbleless ocean sands, vast expanses of salt meadow, white-cedar swamps, inland pine barrens, flat plains, colorful downs, fiordlike harbors, bays, ponds, lakes and freshwater bogs. It offers something to suit the taste for nature in each of us. It is a remarkably varied, beautiful and fertile insular tract, lying at the threshold of the greatest urban center in the nation. For 250 years after its first settlement Long Island changed little. From 1812 to the turn of the century Suffolk County's total population increase amounted to only 42,582 souls. Even the railroad did little to alter the generally rural atmosphere. All this serenity came to an abrupt end following World War II when people, equal in number to the population of more than a dozen states, emigrated eastward across the city line. Vast public works were carried out, parkways and expressways laced the largest island on the Atlantic seaboard. But it was not until 1974, two years after passage of the Federal Water Pollution Control Act Amendments, that the fruits of environmental management became apparent and resulted in this far-reaching document. Chronologically it represents the Region's fourth most important plan—following the Nassau County Charter in 1938, the Suffolk County Charter in 1959 and the Bi-county Comprehensive Development Plan in 1970—affecting the lives of all its residents.

There is a valid question concerning the Region's success in developing comprehensive studies. Would they be possible without a regional planning agency? Possibly, yes; anything is. But as timely and of such professional calibre; probably not. Therefore, the underlying wisdom in establishing an areawide regional planning agency has been amply justified. The Nassau-Suffolk Regional Planning Board was created in 1965 by adoption of ordinances and resolutions by the Boards of Supervisors of Nassau and Suffolk, in accordance with provisions of the General Municipal Laws of New York State. As the solutions to economic and social problems become increasingly regionwide in nature, having this agency with a proven track record in performance already in place will serve as a source of assurance to Long Island citizens.

It would be extremely shortsighted to view this plan as just another study—its pages like leaves on trees, deciduous and gone, once fallen to the ground. Its direct value is in its use as a working document, important to the life-styles of future generations and business growth. Indirectly, the applicability of its analyses and findings renders it of national importance and in turn assures national recognition of Long Island as a homogeneous entity with identity well beyond its false reputation as simply a bedroom community.

There is a legal expression, "The evidence speaks for itself." So do the following pages. In the main, Long Island's water supply, derived solely from its own groundwater sources (and not even partially from Connecticut—the erroneous impression lingers) is adequate in terms of quantity. Tunnels from upstate or other outside sources are not only unnecessary, they are equally foolish even to consider. But there is the point-blank question of preserving the quality of our water. This stern challenge must be met by the courage of government supported by an informed constituency, sensitive to parochial interests, yet willing to override them for the common good. Effective implementation will provide bread-and-butter benefits in preserving home values, protecting the quality of life and sustaining economic strength.

Elsewhere in this document the reader will find amply justified expressions of appreciation to the numerous private citizens who served on the technical and citizens advisory committees. Policy was always determined by Board members, past and present. Their cooperation along with that of elected officials was crucial to the completion of this work. In this regard our lasting gratitude is enthusiastically extended to the following: to former founding member and Chairman, Leonard W. Hall; former County Executives Ralph G. Caso and H. Lee Dennison; County Executives John V. N. Klein and Francis T. Purcell; former Board members, Thomas Halsey and Robert Flynn; and present Board members: Vice Chairman Seth Hubbard, Vincent Balletta, Robert Bell, Winfield Fromm and John Wickham. Finally, words are often weak and fruitless when attempting to describe the single most important contribution. For that I simply conclude with where it all began, was and will be, by use of proper noun: Dr. Lee E. Koppelman.

Harold V. Gleason
Chairman

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This program has been a collective endeavor in the best sense of that term. Interdisciplinary skills involving a wide array of scientific talents, and administrative inputs from all levels of government, were required. The program could not have been satisfactorily completed without the enthusiastic participation and support of all persons involved in the development of the Nassau-Suffolk Areawide Waste Treatment Management Plan. The dedication and pride of involvement displayed by the members of the various county departments, consulting firms, and members of the public, were indeed a marvel, and credit for the products of this program must be shared with these people. We have tried to acknowledge their contributions by including their names on the Participation Page. We sincerely hope that we have not inadvertently omitted recognition of anyone. In particular, we owe a debt to our colleagues of the United States Environmental Protection Agency, Region II, who displayed as deep a commitment to the interests of Long Island as any of the local representatives. Mr. Eckardt Beck, Regional Administrator, and his able colleagues, Mr. Conrad Simon, Mr. Charles Durfor, Mr. Anthony Conetta and others, provided invaluable guidance and staff support. They were positive advocates for the program from its inception. Our requests were seriously considered and promptly acted upon—including bringing Federal scientific experts to our agency as specific problems unfolded. We enjoyed similar general support from the New York State Department of Environmental Conservation. Commissioner Peter Berle, Deputy Commissioner Theodore Hullar, Mr. Thomas Eichler, Mr. Michael O'Toole, Jr., Mr. Philip DeGaetano, Mr. Philip Barbato, Mr. Andrew Yerman, Mr. James Redman, and Mr. Wiacheslaw Fedoriw, ably represented the State's interests.

This summary documentation volume is the result of a special effort to afford the reader a solid cross-section of the supporting material used in formulating the Plan. Therefore, it is proper to acknowledge those professionals who were responsible for each of the sections. Section One was prepared by Malcolm Hair using data from field surveys and modeling studies conducted by Tetra Tech, Inc., with the assistance of member agencies. Section Two was written by David W. Miller, assisted by Jeffrey P. Sgambat, Charles A. Rich and Thomas L. Tessier. Section Three was written by James Vaughn, E.F. Landry and the following members of the Brookhaven National Laboratory Virology Group: M.Z. Thomas, Cheryl Ann Beckwith, Lois J. Baranosky, Marilyn Dahl, Neva Delihas, Wayne Penello, Mary Purpura and Thomas Vicale. Section Four was written by Ron Beck with the assistance of William Steinhauer, Mark Scott, John Ehrenfeld, Robert Pojasek, Ann Baxter and Gail Schubert. Section Five was written by Keith Porter assisted by David Bouldin, Christine Shoemaker, Leland Baskin, Douglas Zaeh, Steven Pacenka, Daniel Fricke, Brian Anderson, Albert Hermann, Wendy King, Karen Kottlar and Cynthia McGaw. Section Six was written by Charles Barnett, Anthony Esser and Adelaide Flatau. Section Seven was written by Edward Beltrami and T. Owen Carroll of S.U.N.Y. at Stony Brook. Section Eight was prepared by the Project Director. Section Nine was prepared by Arthur Kunz, Edith Tannenbaum and Carol Moor.

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Prefatory Comments

Introduction

The passage of the Federal Water Pollution Control Act Amendments of 1972 heralded a new era in environmental management. National interest and purpose was stated in the goal to achieve "water quality which provides for the protection and propagation of fish, shellfish and wildlife and provides for recreation in and on the water" by 1983, wherever attainable. It not only set forth a timetable for action but also provided some new approaches to solving the problems of our nation's polluted waters. For the first time there is a clear recognition that improved quality and the prevention of further pollution will also require changes in land use and management of growth in addition to the prevailing practice of building sewage treatment works. Non-point sources of contamination which result from construction and agricultural activities, highway runoff, widespread discarding of the residues of modern society, and the lack of control over animal wastes, etc. must now be considered. The Act is a landmark in three other instances. It provides for a comprehensive planned approach, requires strong citizen participation in the planning process and mandates a commitment from state and local governments to implement the results of the planning effort.

Section 208 of the Act specifically creates a comprehensive water quality management program to deal explicitly with both the treatment and the prevention of water pollution. The plans prepared under this program must include a process for meeting established water quality goals and must show that management institutions exist with sufficient financial and legal authorities to implement the plan; or that new institutional arrangements will be created to achieve this purpose.

The Nassau-Suffolk Regional Planning Board (NSRPB) was designated by Governor Malcolm Wilson in December 1974 as the regional planning entity to carry out Section 208 planning for Nassau and Suffolk Counties. Realizing that a program of this magnitude had to have the support and input from those governmental agencies that either have an interest in, or a mandated role to play in water pollution control, the NSRPB immediately established a Technical Advisory Committee (TAC) to assist it in the preparation of the plan. The initial voting constituency of the TAC included representatives from the Nassau County Departments of Health, Public Works and Planning. The Suffolk County participants were from the Departments of Health and Environmental Control and the Suffolk County Water Authority. The seventh member was the Executive Director of the Nassau-Suffolk Regional Planning Board who served as Chairman of the Technical Advisory Committee and Project Director for the overall program.

In addition to the seven voting members, representatives from the Interstate Sanitation Commission, Region II of the Environmental Protection Agency (EPA), the New York State Department of Environmental Conservation (NYSDEC), the United States Geological Survey (USGS), the Suffolk County Soil and Water Conservation District and the Soil Conservation Service (SCS), the Cooperative Extension Service (CES) and the New York State Department of Health (NYSDH) were invited to participate as resource members.

In accordance with the guidelines for Section 208, and prior practices of the Board in conducting other regional planning studies, the Citizens Advisory Committee (CAC) was created to provide input to the TAC from the general public, and to act as a forum for distributing the findings of the study to the general public.

The Program received a $5.2 million grant from the EPA to carry out the detailed work program necessary to comply with the requirements of the Act.

Between January 1975 and June 1978 the TAC, which was formed prior to the grant award in June 1975, met at least one day a week, first for the design of the Program and selection of consultants, and then for the general conduct of the Program. The CAC met bi-weekly during this period.

The consultants retained to carry out specific technical tasks were selected by national solicitation on the basis of merit. This single factor was one of the key elements in achieving the high level of competence displayed in the Plan.

Report Description

This volume is a consolidation of the six interim reports, and the special report on animal wastes, published during the conduct of the study. It summarizes the almost 200 technical documents used in the preparation of the 208 Plan. In addition, two new sections have been added that discuss the results of the organics sampling program and the nitrates study. This particular information was an integral input into the Plan and appears here in print for the first time.

This volume affords the serious reader a reasonably complete summary of the scientific and planning data used in developing and substantiating the direction of the recommended alternatives in the Summary Plan (Volume I).

The presentation is in nine sections, with two appendices. The first two sections describe surface and groundwater conditions, followed by four sections that provide more detailed information on the four major parameters that impact ground and surface waters, *i.e.,* viruses, organics, nitrates and animal wastes. The next section explains the types of models used for analytical and predictive purposes in assessing ground and surface water conditions. The last two sections present the management alternatives and population projections developed for the Plan. The appendices provide detailed tabular demographic data.

Section One—Surface Water Quality—contains the summarized results of the collection and review of all existing data on marine surface waters; the statistical analysis of, and identification of shortfalls in, the existing data; the design of field sampling programs to complete the data base; and the design, calibration and verification of the mathematical models used to represent and predict surface water quality under various conditions.

Section Two—Groundwater Conditions—is presented in three parts. The first discusses the availability of water in the two counties, and includes a brief explanation of some of the previously proposed water management plans applicable to Long Island. The second part is an assessment of the principal sources of groundwater contamination. The last part characterizes existing groundwater conditions, by aquifer; discusses trends in quality; and summarizes the preliminary findings of the virus study and organics evaluation.

Section Three—Virus Study—proceeds from a literature review to a discussion of the methodology used in site selection, sample collection, virus concentration and isolation, and identification procedures and related tests. This is followed by a discussion of the results of the study in terms of its implications for ground and surface waters.

Section Four—Organics—summarizes the methodology and analytical results of the sampling program, which attempted to determine the types of organic compounds that may already have contaminated portions of the aquifer system. Health implications are discussed.

Section Five—Nitrates—provides an overview of existing data on nitrogen sources to groundwater. The methodologies and results of fertilizer use surveys and field studies are described. The relationship between development and groundwater quality degradation is examined, and a regional nitrogen budget is presented.

Section Six—Animal Wastes—discusses the impact of animal wastes as a major non-point source of pollutants to ground and surface waters. It also contains a series of administrative and legal recommendations for the control and management of animals and their wastes.

Section Seven—Modeling Studies—presents a brief description of the hydrodynamic principles used in the design of water quality models. This is followed by a description and discussion of the surface water and groundwater models used in the 208 Study.

Section Eight—Management Options—addresses non-point pollution sources and stresses non-structural solutions, stormwater runoff control, conservation, and watershed management in the first of two parts. The latter portion addresses point source pollution control, where the emphasis is on structural solutions. Conventional treatment technology is described. The balance of this part mentions alternatives to conventional technology, ranging from sprinkler irrigation and meadow/marsh/pond systems, to on-site facilities.

Section Nine—Population Projections 1975—1995—contains estimates of the 1975 population and of the population at zoned capacity for each of the 108 municipalities, 126 school districts, and 30 drainage basins in the two counties. It also contains population projections in five-year intervals for these areas. Two appendices are included. The first is a complete tabular listing of the projection series. The second discusses the comparison of these projections with projections made earlier by other agencies.

Administrative Observations

The Section 208 effort discussed herein has proven to be challenging and rewarding. Since the Program is entirely new from a national point of view, it can serve as an example for other parts of the nation. An indication of the strengths and weaknesses, successes and failures resulting from this initial effort can assist in the formulation of continuing programs to be carried out in this Region and in other parts of the country.

First among the strengths, we should acknowledge the strong interest and support received from Region II of EPA, which recognized that Nassau and Suffolk Counties are completely dependent on groundwater for potable water supply; have a varied and complex marine environment surrounding the entire Region; and contain areas of human settlement that represent the full triad of planning concerns, *i.e.,* urban, urban-suburban interface, suburban-rural interface. The recognition by EPA that all three impact the natural environment led to the granting of sufficient funds—well beyond the normal allocation formula—to carry out the program.

Second among them was the full cooperation in the best professional sense, of the various members of the TAC who represented organizations

with sometimes strong and differing institutional biases. Third was the very high caliber of talent that exists in public service at all levels of government and which is evidenced in the results of this Study. A fourth source of strength was the impartial selection of consultants by the TAC without any external political or parochial controls to inhibit its national search for the most competent firms; and a fifth was the establishment of a strong CAC, who were self-organized rather than selected by the agency.

The weaknesses of the Program were primarily of an administrative and timing nature. Two major limitations were imposed by the insistence of EPA on plan completion, including approval by the Governor, within a two-year planning period. Although the Act requires Plan development within twenty-four months, provisions existed for project design prior to this phase for up to twelve months. EPA determined to dispense with the pre-planning opportunity. In a sense this fiat is the antithesis of the planning concept itself. The Agency was forced to "learn on the job," thus creating plans by work assignment amendments. The problem was further compounded by the changes in guidelines, regulations and reporting procedures imposed by EPA after the contract and original work program were agreed upon and approved. In essence, EPA was also "learning on the job."

The remedy for these time constraints was either to curtail some of the work efforts or to rigorously manage the productivity of staff and consultants. We chose the latter course, thus placing all of the participants under constant pressure. This in not an optimal administrative choice.

The second shortfall could have developed at the end of the planning period. Implementation, in the full sense of the term, often can take as much time as the Plan development process itself. If the intent is to achieve the sincere acceptance and approval of the general public and various elected and appointed officials—and not be the result of default—then the planners and CAC members must have adequate opportunity to present the case. This was attempted in part during the plan development period. The Project Director delivered nearly 50 presentations to various governmental, professional, civic, environmental and business groups in the two counties. Other members of the TAC, CAC, and consultants also made many presentations. However, the Plan options themselves could only be finalized at the end of the planning process. Thus, the public information phase has to extend beyond the first two years. This is particularly the case in a region of almost three million people. One, or even several, "public hearings" are simply not adequate.

Fortunately, our colleagues at EPA recognized this problem and granted a time extension. Thus far, the Project Director and other TAC members have made formal presentations to almost all of the municipal governments and the two county legislative bodies. In some instances, towns have asked for a second public hearing in order to attract wide citizen attendance. This will be done in the coming weeks. The speakers' bureau, organized by members of the Citizen Advisory Committee, has assumed the responsibility for making similar presentations to non-governmental groups. It is pleasant to note that the result of these efforts have been overwhelmingly positive. Support from government, in the form of formal resolutions of support, has been most gratifying.

Another positive result has been the immediate implementive responses. One of the major towns directed their 201 consultant to conform to the 208 Plan recommendations. In another case, the Attorney General of the State of New York has taken steps to ban or otherwise control the sale and use of certain toxic compounds that can contaminate ground and surface waters. The County of Suffolk is in the process of placing de-icing materiais under proper cover, and several municipalities have passed ordinances to control animal wastes. EPA itself has designated the aquifer of Long Island to be a "Sole Source Aquifer." These are encouraging indications that the Long Island 208 Plan will not be a shelved "paper plan."

July 31, 1978

Lee Koppelman
Project Director