

PUBLIC HEARING

before

SENATE COMMITTEE ON ENERGY AND ENVIRONMENT
and
ASSEMBLY COMMITTEE ON AGRICULTURE AND ENVIRONMENT

on

S-1659, S-1804, S-1808 and A-2320, A-2357

(Ocean Pollution)

Held:
March 16, 1977
Ocean County Community College
Toms River, New Jersey

MEMBERS OF COMMITTEES PRESENT:

Senator John F. Russo (Chairman)
Senator Joseph L. Mc Gahn
Senator Barry T. Parker
Assemblyman James J. Barry
Assemblyman C. Louis Bassano
Assemblyman Walter J. Kozloski

ALSO:

David C. Mattek, Research Associate
Legislative Services Agency
Aide, Senate Committee on Energy and Environment

Michael F. Catania, Research Associate
Legislative Services Agency
Aide, Assembly Committee on Agriculture and Environment

Algis P. Matioska, Research Associate
Legislative Services Agency
Staff, Special Assembly Ocean Dumping Committee

STATE OF TEXAS

before

JOINT COMMITTEE ON ENERGY AND ENVIRONMENT

and

ASSEMBLY COMMITTEE ON AGRICULTURE AND ENVIRONMENT

on

H.B. 1002, H.B. 1003, H.B. 1004, H.B. 1005 and H.B. 1006

(House Bill)

March 14, 1977
Green County Community College
Tomb River, New Jersey

MEMORANDUM FOR THE COMMITTEE

Re: H.B. 1002, H.B. 1003, H.B. 1004, H.B. 1005 and H.B. 1006
The following information was received from the Green County Community College, Tomb River, New Jersey, on March 14, 1977:

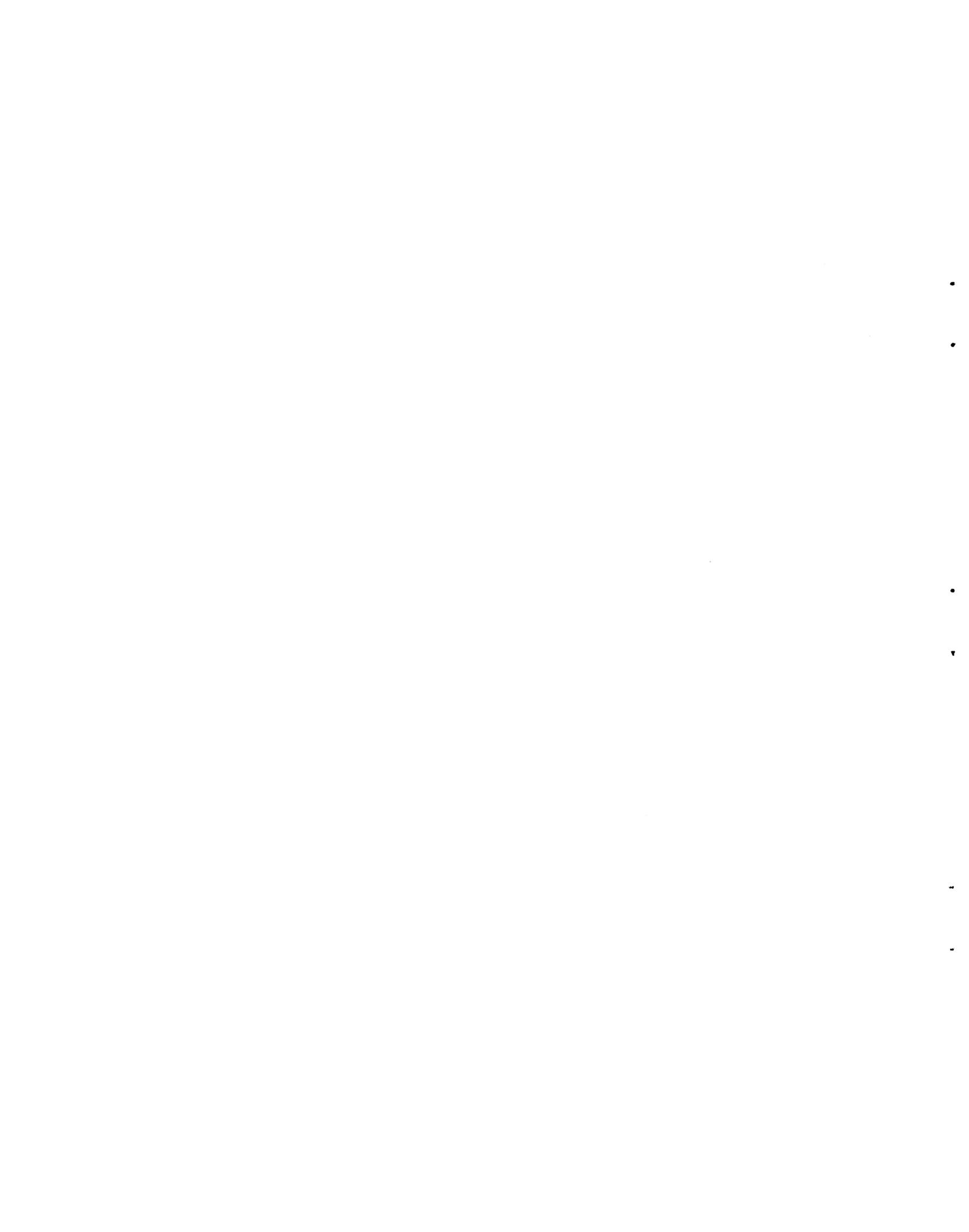
David L. ...
Executive Director
Green County Community College
Tomb River, New Jersey

Michael J. ...
Executive Director
Green County Community College
Tomb River, New Jersey

John J. ...
Executive Director
Green County Community College
Tomb River, New Jersey

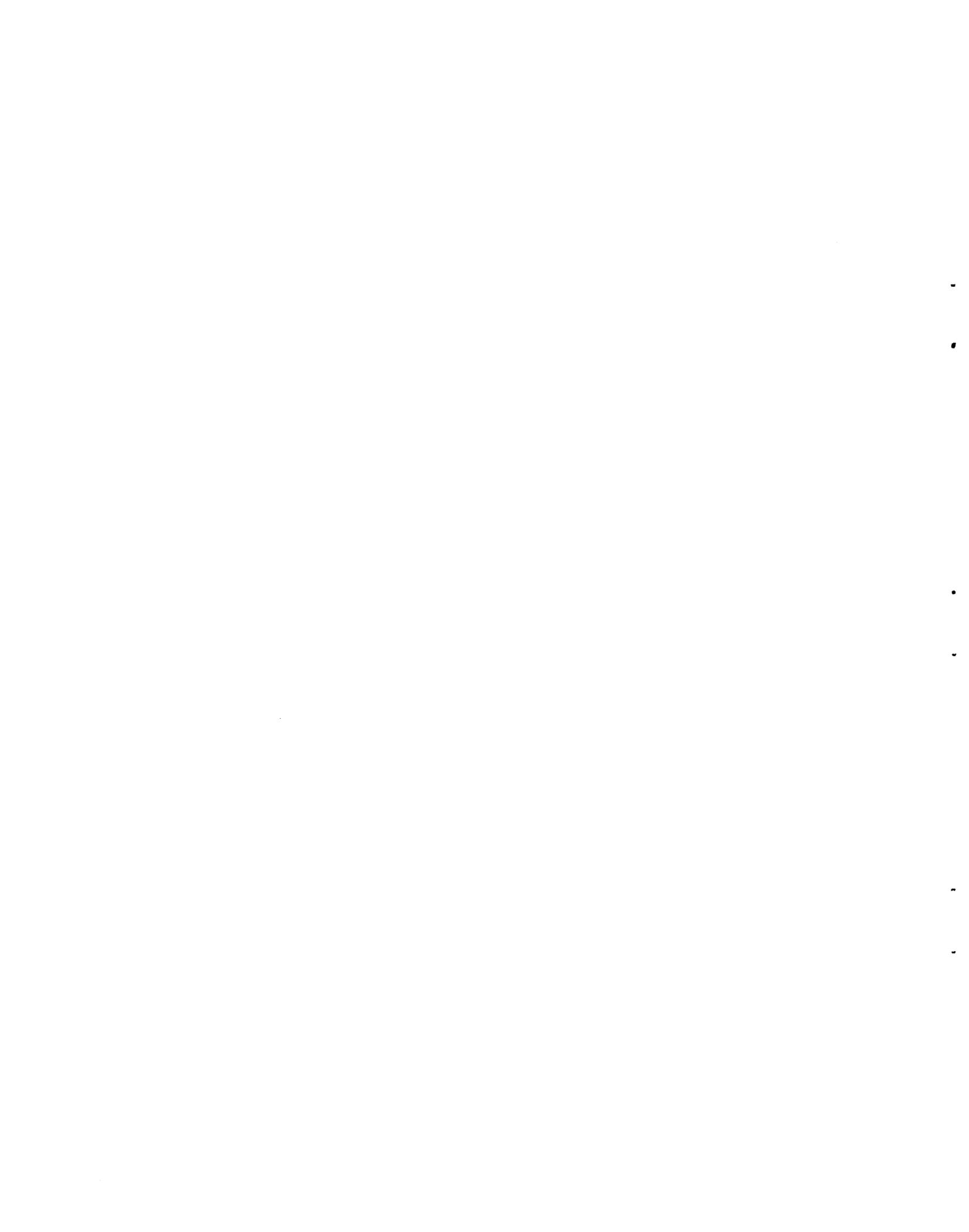
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SENATE, No. 1659

STATE OF NEW JERSEY

INTRODUCED SEPTEMBER 23, 1976

By Senators PARKER, RUSSO and VREELAND

Referred to Committee on Energy and Environment

AN ACT supplementing the "Clean Ocean Act," approved June 1, 1971 (P. L. 1971, c. 177; C. 58:10-23.25 et seq.).

1 BE IT ENACTED *by the Senate and General Assembly of the State*
2 *of New Jersey:*

1 1. After January 1, 1977 no person shall dispose of any sludge
2 in the ocean or in any of the waters of this State and no person
3 shall load a vessel with sludge which is to be disposed in the ocean
4 or in any of the waters of this State.

1 2. As used in this act, the word "sludge" means domestic or
2 industrial sewage or wastes and the solids precipitates and liquids
3 derived during the storage or treatment of said domestic or indus-
4 trial sewage or wastes.

1 3. Within 30 days of the passage of this act, every generator
2 of sludge shall report to the commissioner, the amount of such
3 sludge which is now disposed of in the ocean or waters of this
4 State and the proposed method for the disposal of such sludge
5 after December 31, 1981.

1 4. The commissioner shall compile a list of sanitary landfills,
2 of landholders, and of any other persons who, currently, accept
3 sludge, whether treated or untreated, for disposal or treatment
4 and the commissioner shall circulate such list to those generators
5 of sludge, who now dispose of sludge in the ocean or waters of
6 this State.

1 5. The commissioner shall review the current literature and
2 studies on alternate methods to ocean dumping for the disposal of
3 sludge, including pyrolysis, incineration, the combined processing
4 of solid waste and sludge, landfilling, the land application of wet
5 or dry sludge, and composting, and shall report the environmental
6 and economic advantages and disadvantages of each such method
7 for the use of interested persons and agencies.

1 6. The commissioner shall designate from three to 30 regional
2 sludge processors from among the existing regional sewerage
3 agencies, solid waste disposers or any other agencies or persons
4 who are capable of disposing of sludge on a long-term basis in an
5 environmentally and economically sound manner. Such designated
6 processors shall be favored in the distribution of any Federal or
7 State aid which is available and shall be required to accept the
8 sludge of smaller adjacent sewerage agencies for processing.

1 7. The commissioner shall promulgate pretreatment standards
2 for sewage, pursuant to P. L. 1972, c. 42 (C. 58:11-49 to 58), which
3 require the removal of heavy metals, nutrients and toxic substances.

1 8. Within 90 days of the effective date of this act, the commis-
2 sioner shall complete each step required herein and shall report
3 to the Legislature on the current and projected methods of sludge
4 disposal and said report shall contain whatever recommendations
5 the commissioner believes appropriate for legislative action to
6 expedite the solution of this problem.

1 9. This act shall take effect immediately.

STATEMENT

This bill prohibits the disposal of sludge in the ocean and in any waters of this State. It recognizes that short-term alternatives will depend, in part, on heavy utilization of sanitary landfills. It further provides procedures for determining long-term disposal strategies, which will include, among other things, the use of sludge as a medium for growing plants, and, possibly, the use of sludge in combination with other solid waste to produce energy, as well as other means of disposal utilizing new or existing technologies. The bill recognizes the regional nature of the problem by requiring the Commissioner of Environmental Protection to designate regional sludge processors, who would be favored for the receipt of Federal or State aid and who would be required to process the sludge of smaller adjacent sewerage agencies. The act requires the commissioner to promulgate pretreatment standards for the removal of heavy metals, nutrients and toxic substances, from sewage, in order to safely utilize any sludge generated from such sewage as a medium for growing crops, as occurs in many Asiatic and European countries.

SENATE, No. 1804

STATE OF NEW JERSEY

INTRODUCED DECEMBER 14, 1976

By Senators RUSSO, BUEHLER and McGAHN

Referred to Committee on Energy and Environment

AN ACT to amend and supplement the "Clean Ocean Act," approved June 1, 1971 (P. L. 1971, c. 177).

1 BE IT ENACTED *by the Senate and General Assembly of the State*
2 *of New Jersey:*

1 1. Section 3 of P. L. 1971, c. 177 (C. 58:10-23.27) is amended to
2 read as follows:

3 3. For the purposes of this act unless the context clearly indicates
4 another meaning:

5 a. "Commissioner" means the Commissioner of Environmental
6 Protection;

7 b. "Department" means the Department of Environmental
8 Protection;

9 c. "Vessel" means every description of watercraft or any other
10 artificial contrivance used, or capable of being used, as a means of
11 transportation on or into water;

12 d. "Person" means and shall include corporations, companies,
13 associations, societies, firms, partnerships and joint stock com-
14 panies as well as individuals, and shall also include all political
15 subdivisions of this State, and any other state, or any agencies or
16 instrumentalities thereof **[.]**;

17 e. "Materials" include, but are not limited to, sewage sludge,
18 acid wastes, chemical wastes, rubble and dredge spoils.

1 2. Section 4 of P. L. 1971, c. 177 (C. 58:10-23.28) is amended
2 to read as follows:

3 4. The commissioner shall **[have the power to]** formulate and
4 promulgate, *within 180 days of the effect date of this act, and may*
5 amend and repeal rules and regulations preventing, conditioning
6 and controlling the loading of a vessel within the State with
7 materials of any composition whatsoever and the handling of such

EXPLANATION—Matter enclosed in bold-faced brackets **[thus]** in the above bill
is not enacted and is intended to be omitted in the law.

8 materials which if disposed of at sea cause, or may tend to cause,
9 adverse effects on the waters, beaches or tidal lands of the State.

1 3. Section 5 of P. L. 1971, c. 177 (C. 58:10-23.29) is amended to
2 read as follows:

3 5. a. The commissioner **[may]** *shall* by rule or regulation require
4 that the person responsible for the loading of a vessel **[or the**
5 **handling of]** *with* materials of any composition whatsoever which
6 are to be disposed of at sea first obtain a permit.

7 The department **[may, in accordance with a fee schedule adopted**
8 **as a rule or regulation, establish and]** *shall* charge fees for **[any**
9 **of the services it performs in connection with this act, including]**
10 the issuance of permits, which fees shall be **[annual or periodical as**
11 **the department shall deem.** The fees charged by the department
12 pursuant to this section shall not be less than \$100.00 nor more
13 than \$1,500.00 based on criteria contained in the fee schedule**]**
14 *at the rate of \$1.00 per cubic yard of materials loaded for ocean*
15 *disposal commencing on July 1, 1977. The rate of the fee shall*
16 *thereafter increase on July 1 of each succeeding year in annual*
17 *increments of \$1.00 per cubic yard of materials.*

18 b. The permit required by this section **[may]** *shall* be conditioned
19 upon compliance with all rules and regulations adopted pursuant
20 to this act.

1 4. (New section) a. There is hereby created and established in
2 the State Treasury a separate fund, to be known as the "Clean
3 Ocean Fund" to be administered by the State Treasurer. The
4 fund shall be credited with all fees and penalties collected pur-
5 suant to this act. Interest received on moneys in the fund shall
6 be credited to the fund.

7 b. The State Treasurer may invest the moneys contained in such
8 fund as other trust funds of the State are invested, and all earnings
9 therefrom shall be accumulated and added to the principal of the
10 fund.

11 c. The moneys in said fund shall be appropriated by law only
12 for the following purposes, upon the certification of the commis-
13 sioner:

14 (1) For the provision of technical and financial assistance by
15 the department to those agencies which develop alternate methods
16 to ocean dumping for the disposal of materials, including sewage
17 sludge, such as pyrolysis, incineration, the combined processing of
18 solid waste and sludge, landfilling, the land application of wet or
19 dry sludge and composting;

20 (2) For the cleanup and removal of materials by the department
21 which are disposed in the ocean and which cause adverse effects on
22 the waters, beaches or tidal lands of this State;

- 23 (3) For the costs of administration of this act.
24 d. At the end of each fiscal year all revenues in excess of a sum
25 calculated by the commissioner, subject to the approval of the
26 State Treasurer, to meet the projected annual costs necessary
27 to assure the continuous administration of this act shall be trans-
28 ferred to the General Fund of the State Treasury.
- 1 5. This act shall take effect immediately.

STATEMENT

This bill amends the Clean Ocean Act to require, rather than authorize, the Commissioner of Environmental Protection to promulgate rules and regulations controlling the loading of a vessel within the State with sewage sludge and other materials and the handling of such materials, which if disposed at sea cause, or may tend to cause adverse effects on the waters, beaches or tidal lands of the State. It, similarly, requires, rather than authorizes, the establishment of permits and contains a revised fee schedule for such permits. The fee charged by the department for a permit for the loading of a vessel with sewage sludge or other materials which are to be disposed at sea shall be \$1.00 per cubic yard of such sewage sludge or other materials during the first year and shall be increased at the rate of \$1.00 per cubic yard for each succeeding year until the disposal at sea of such materials is terminated.

A supplementary section establishes a "Clean Ocean Fund," authorizes the Department of Environmental Protection to provide technical and financial assistance to those agencies which develop alternate methods to ocean dumping for the disposal of sewage sludge and other materials and authorizes the department to clean up and remove those materials which cause adverse effects on the waters, beaches or tidal lands of the State. The financial and technical assistance, the cleanup and removal costs and the costs of administration are to be financed from Legislative appropriations earned from the fees charged for the loading of a vessel with said materials. The fees are high and will be increased annually in order to make the cost of ocean dumping less attractive than alternate methods of disposal.



SENATE, No. 1808

STATE OF NEW JERSEY

INTRODUCED DECEMBER 14, 1976

By Senators PARKER, BEADLESTON, RUSSO, ZANE, CAFIERO,
VREELAND, IMPERIALE, McGAHN, BUEHLER and
DAVENPORT

Referred to Committee on Energy and Environment

AN ACT to authorize the creation of a debt of the State of New Jersey by the issuance of bonds of the State in the aggregate principal amount of \$100,000,000.00 for the purposes of researching, planning, acquiring, developing, constructing, improving and maintaining methods and facilities for improving the quality of New Jersey's ocean waters and for providing alternative means which do not utilize the ocean as the repository of wastes; providing the ways and means to pay the interest of such debt and also to pay and discharge the principal thereof; and providing for the submission of this act to the people at a general election; and providing an appropriation therefor.

1 BE IT ENACTED by the Senate and General Assembly of the State
2 of New Jersey:

1 1. This act shall be known and may be cited as the "Clean Ocean
2 Waters Bond Act."

1 2. The Legislature finds and determines that the ocean off the
2 coast of the State is being used increasingly for the disposal of
3 wastes, including sewage sludge, industrial wastes and dredged
4 spoils; that ocean-dumped wastes contain materials which may have
5 adverse effects on the public health, safety, and welfare; that
6 many of these materials are toxic to human and marine life, and
7 are damaging to the fish population and the food chain supporting
8 all life including man, as well as to other valuable natural and
9 economic resources; and that therefore the State must regulate and
10 control this practice and encourage the development and utilization
11 of advanced and alternative methods of waste disposal which do
12 not utilize the ocean as the repository for harmful materials and

13 develop and utilize methods to clean and treat its ocean waters to
14 insure their suitability to human and marine life.

1 3. As used in this act:

2 a. "Bonds" means the bonds authorized to be issued, or issued,
3 under this act;

4 b. "Commissioner" means the Commissioner of Environmental
5 Protection;

6 c. "Construct" and "construction" mean, in addition to the
7 usual meaning thereof, acts of construction, reconstruction, re-
8 placement, extension, improvement and betterment;

9 d. "Cost" shall mean, in addition to the usual connotations
10 thereof, the cost of acquisition or construction of all or any part
11 of a project and of all or any real or personal property, agreements
12 and franchises deemed by the department to be necessary or useful
13 and convenient therefor or in connection therewith, including
14 interest or discount on bonds, cost of issuance of bonds, cost of
15 geological and hydrological services, engineering and inspection
16 costs and legal expenses, cost of financial, professional and other
17 estimates and advice, organization, administrative, operating and
18 other expenses prior to and during such acquisition or construction,
19 and all such other expenses as may be necessary or incident to the
20 financing, acquisition, construction and completion of such project
21 or part thereof and the placing of the same in operation, and also
22 such provision for reserves for working capital, operating, main-
23 tenance or replacement expenses and for payment or security
24 of principal of or interest on bonds during or after such acquisition
25 or construction as the State Comptroller may determine, and also
26 reimbursements to the State General Fund, or to any other fund
27 from which moneys may have been transferred to the State General
28 Fund, of any moneys theretofore expended for or in connection
29 with such project;

30 e. "Department" means the Department of Environmental
31 Protection;

32 f. "Net revenues" means any or all revenues received by the
33 department from the operation of a project or any part thereof, in
34 excess of the operating expenses thereof and provision for such
35 reasonable reserves therefor as the State Comptroller may require
36 or approve;

37 g. "Operating expenses" means, in addition to the usual mean-
38 ings thereof, all costs and expenses of operating, maintaining, man-
39 aging, repairing and reconstructing a project and each and every
40 part thereof including, without limiting the generality of the fore-

41 going, administrative expenses, premiums on insurance, including
42 use and occupancy insurance and casualty insurance, costs of
43 collection of any revenues, legal and engineering expenses, financ-
44 ing expenses, payments to employee retirement, insurance, health
45 and hospitalization funds, expenses, liabilities and compensation
46 of fiduciaries, and any other expenses required to be paid for or
47 with respect to proper operation or maintenance of such project;

48 h. "Project" means any work relating to ocean water improve-
49 ment methods and facilities;

50 i. "Real property" means lands, within or without the State,
51 and improvements thereof or thereon, any and all rights-of-way,
52 water, riparian and other rights, any and all easements, and privi-
53 leges in real property, and any right or interest of any kind or
54 description in, relating to or connected with real property;

55 j. "Ocean water improvement methods and facilities" means:

56 (1) The planning, research, development and implementation of
57 methods to (a) detoxify, filter, treat and generally improve the
58 quality of the ocean waters of this State, and (b) provide alternative
59 means of waste treatment and disposal which do not utilize the
60 ocean as a repository; and

61 (2) The real property and the plants, structures, machinery and
62 equipment and other property, real, personal and mixed, acquired,
63 constructed or operated, or to be acquired, constructed or operated
64 in whole or in part by or on behalf of the State, or a political
65 subdivision or subdivisions of the State, or any agency of the State
66 or of a political subdivision or subdivisions thereof, for the purpose
67 of treating or disposing of ocean-dumped wastes, providing alterna-
68 tive means of treatment and disposal of those wastes and for
69 generally improving the quality of this State's ocean waters.

70 k. "Commission" means the New Jersey Commission on Capital
71 Budgeting and Planning.

1 4. Bonds of the State of New Jersey are hereby authorized to
2 be issued in the aggregate principal amount of \$100,000,000.00 for
3 the purposes of researching, planning, acquiring, developing, con-
4 structing, improving and maintaining methods and facilities for
5 improving the quality of New Jersey's ocean waters and for pro-
6 viding alternative means which do not utilize the ocean as the
7 repository of wastes.

1 5. The commissioner shall issue and promulgate such rules and
2 regulations as are necessary and appropriate to carry out the
3 provisions of this act. The commissioner shall review and consider

4 the findings and recommendations of the commission in the admini-
5 stration of the provisions of this act.

1 6. Said bonds shall be serial bonds and known as "Clean Ocean
2 Waters Bonds" and as to each series, the last annual installment
3 thereof (subject to redemption prior to maturity) shall mature and
4 be paid not later than 35 years from the date of its issuance but may
5 be issued in whole or in part for a shorter term.

6 Said bonds shall be issued from time to time as the issuing officials
7 herein named shall determine.

1 7. The Governor, State Treasurer and Comptroller of the
2 Treasury or any two of such officials (hereinafter referred to as
3 "the issuing officials") are hereby authorized to carry out the pro-
4 visions of this act relating to the issuance of said bonds, and shall
5 determine all matters in connection therewith subject to provisions
6 hereof. In case any of said officials shall be absent from the State
7 or incapable of acting for any reason, his powers and duties shall
8 be exercised and performed by such person as shall be authorized
9 by law to act in his place as a State official.

1 8. Bonds issued in accordance with the provisions of this act
2 shall be a direct obligation of the State of New Jersey and the faith
3 and credit of the State are pledged for the payment of the interest
4 thereon as same shall become due and the payment of the principal
5 at maturity. The principal and interest of such bonds shall be
6 exempt from taxation by the State or by any county, municipality
7 or other taxing district of the State.

1 9. Said bonds shall be signed in the name of the State by the
2 Governor or by his facsimile signature, under the Great Seal of the
3 State, and attested by the Secretary of State, or an assistant Secre-
4 tary of State, and shall be countersigned by the facsimile-signature
5 of the Comptroller of the Treasury. Interest coupons attached to
6 said bonds shall be signed by the facsimile signature of the Comp-
7 troller of the Treasury. Such bonds may be issued notwithstanding
8 that any of the officials signing them or whose facsimile signatures
9 appear on the bonds or coupons shall cease to hold office at the time
10 of such issue or at the time of the delivery of such bonds to the
11 purchaser.

1 10. a. Such bonds shall recite that they are issued for the
2 purposes set forth in section 4 of this act and that they are issued
3 in pursuance of this act and that this act was submitted to the
4 people of the State at the general election held in the month of
5 November, 1977, and that it received the approval of the majority
6 of votes cast for and against it at such election. Such recital in

7 said bonds shall be conclusive evidence of the authority of the
8 State to issue said bonds and of their validity. Any bonds contain-
9 ing such recital shall in any suit, action or proceeding involving
10 their validity be conclusively deemed to be fully authorized by this
11 act and to have been issued, sold, executed and delivered in con-
12 formity herewith and with all other provisions of statutes
13 applicable thereto, and shall be incontestable for any cause.

14 b. Such bonds shall be issued in such denominations and in such
15 form or forms, whether coupon or registered as to both principal
16 and interest, and with or without such provisions for interchange-
17 ability thereof, as may be determined by the issuing officials.

1 11. When the bonds are issued from time to time the bonds of each
2 issue shall constitute a separate series to be designated by the
3 issuing officials. Each series of bonds shall bear such rate or rates
4 of interest as may be determined by the issuing officials, which
5 interest shall be payable semiannually; provided, that the first
6 and last interest periods may be longer or shorter, in order that
7 intervening semiannual payments may be at convenient dates.

1 12. Said bonds shall be issued and sold at such price not less than
2 the par value thereof and accrued interest thereon, and under such
3 terms, conditions and regulations, as the issuing officials may pre-
4 scribe, after notice of said sale, published at least once in at least
5 three newspapers published in the State of New Jersey, and at
6 least once in a publication carrying municipal bond notices and
7 devoted primarily to financial news, published in the city of New
8 York or in New Jersey, the first notice to be at least 5 days prior
9 to the day of bidding. The said notice of sale may contain a pro-
10 vision to the effect that any or all bids in pursuance thereof may
11 be rejected. In the event of such rejection or of failure to receive
12 any acceptable bid, the issuing officials, at any time within 60 days
13 from the date of such advertised sale, may sell such bonds at
14 private sale at such price not less than the par value thereof and
15 accrued interest thereon and under such terms and conditions as
16 the issuing officials may prescribe. The issuing officials may sell
17 all or part of the bonds of any series as issued to any State fund
18 or to the Federal Government or any agency thereof, at private
19 sale, without advertisement.

1 13. Until permanent bonds can be prepared, the issuing officials
2 may, in their discretion, issue in lieu of such permanent bonds
3 temporary bonds in such form and with such privileges as to
4 registration and exchange for permanent bonds as may be deter-
5 mined by the issuing officials.

1 14. The proceeds from the sale of the bonds shall be paid to the
2 State Treasurer and be held by him in a separate fund, and be
3 deposited in such depositories as may be selected by him to the
4 credit of the fund, which fund shall be known as the "Clean Ocean
5 Waters Fund."

1 15. a. The moneys in said "Clean Ocean Waters Fund" are
2 hereby specifically dedicated and shall be applied to the cost of the
3 purposes set forth in section 4 of this act, and all such moneys are
4 hereby appropriated for such purposes, and no such moneys shall
5 be expended for such purpose (except as otherwise hereinbelow
6 authorized) without the specific appropriation thereof by the Legis-
7 lature, but bonds may be issued as herein provided notwithstanding
8 that the Legislature shall not have then adopted an act making
9 specific appropriation of any of said moneys.

10 b. At any time prior to the issuance and sale of bonds under this
11 act, the State Treasurer is hereby authorized to transfer from any
12 available money in the treasury of the State to the credit of the
13 "Clean Ocean Waters Fund" such sum as he may deem necessary.
14 Said sum so transferred shall be returned to the treasury of this
15 State by the treasurer thereof from the proceeds of the sale of the
16 first issue of bonds.

17 c. Pending their application to the purpose provided in this act,
18 moneys in the "Clean Ocean Waters Fund" may be invested and
19 reinvested as other trust funds in the custody of the State
20 Treasurer in the manner provided by law. Net earnings received
21 from the investment or deposit of such fund shall be paid into the
22 General State Fund.

1 16. In case any coupon bonds or coupons thereunto appertaining
2 or any registered bond shall become lost, mutilated or destroyed, a
3 new bond shall be executed and delivered of like tenor, in substitu-
4 tion for the lost, mutilated or destroyed bonds or coupons, upon the
5 owner furnishing to the issuing officials evidence satisfactory to
6 them of such loss, mutilation or destruction, proof of ownership and
7 such security and indemnity and reimbursement for expenses as
8 the issuing officials may require.

1 17. Accrued interest received upon the sale of said bonds shall be
2 applied to the discharge of a like amount of interest upon said
3 bonds when due. Any expense incurred by the issuing officials for
4 advertising, engraving, printing, clerical, legal or other services
5 necessary to carry out the duties imposed upon them by the pro-
6 visions of this act shall be paid from the proceeds of the sale of
7 said bonds, by the State Treasurer upon warrant of the Comp-

8 troller of the Treasury, in the same manner as other obligations
9 of the State are paid.

1 18. Bonds of each series issued hereunder shall mature in annual
2 installments commencing not later than the tenth year and ending
3 not later than the thirty-fifth year from the date of issue of such
4 series, and in such amounts as shall be determined by the issuing
5 officials, and the issuing officials may reserve to the State by appro-
6 priate provision in the bonds of any series the power to redeem all
7 or any of such bonds prior to maturity at such price or prices and
8 upon such terms and conditions as may be provided in such bonds.

1 19. The issuing officials may at any time and from time to time
2 issue refunding bonds for the purpose of refunding in whole or in
3 part an equal principal amount of the bonds of any series issued
4 and outstanding hereunder, which by their terms are subject to
5 redemption prior to maturity, provided such refunding bonds shall
6 mature at any time or times not later than the latest maturity date
7 of such series, and the aggregate amount of interest to be paid on
8 the refunding bonds, plus the premium, if any, to be paid on the
9 bonds refunded, shall not exceed the aggregate amount of interest
10 which would be paid on the bonds refunded if such bonds were not
11 so refunded. Refunding bonds shall constitute direct obligations of
12 the State of New Jersey, and the faith and credit of the State are
13 pledged for the payment of the principal thereof and the interest
14 thereon. The proceeds received from the sale of refunding bonds
15 shall be held in trust and applied to the payment of the bonds re-
16 funded thereby. Refunding bonds shall be entitled to all the bene-
17 fits of this act and subject to all its limitations except as to the
18 maturities thereof and to the extent herein otherwise expressly
19 provided.

1 20. To provide funds to meet the interest and principal payment
2 requirements for the bonds issued under this act and outstanding,
3 there is hereby appropriated in the order following:

4 a. Revenue derived from the collection of taxes as provided by
5 the "Sales and Use Tax Act" (P. L. 1966, c. 30) as amended and
6 supplemented, or so much thereof as may be required; and

7 b. If in any year or at any time funds, as hereinabove appro-
8 priated, necessary to meet interest and principal payments upon
9 outstanding bonds issued under this act, be insufficient or not
10 available then and in that case there shall be assessed, levied and
11 collected annually in each of the municipalities of the counties of
12 this State a tax on real and personal property upon which municipi-
13 pal taxes are or shall be assessed, levied and collected, sufficient to
14 meet the interest on all outstanding bonds issued hereunder and

15 on such bonds as it is proposed to issue under this act in the
16 calendar year in which such tax is to be raised and for the payment
17 of bonds falling due in the year following the year for which the
18 tax is levied. The tax thus imposed shall be assessed, levied and
19 collected in the same manner and at the same time as other taxes
20 upon real and personal property are assessed, levied and collected.
21 The governing body of each municipality shall cause to be paid to
22 the county treasurer of the county in which such municipality is
23 located, on or before December 15 in each year, the amount of tax
24 herein directed to be assessed and levied, and the county treasurer
25 shall pay the amount of said tax to the State Treasurer on or
26 before December 20 in each year.

27 If on or before December 31 in any year the issuing officials shall
28 determine that there are moneys in the General State Fund beyond
29 the needs of the State, sufficient to meet the principal of bonds
30 falling due and all interest payable in the ensuing calendar year,
31 then and in the event such issuing officials shall by resolution so
32 find and shall file the same in the office of the State Treasurer,
33 whereupon the State Treasurer shall transfer such moneys to a
34 separate fund to be designated by him, and shall pay the principal
35 and interest out of said fund as the same shall become due and
36 payable, and the other sources of payment of said principal and
37 interest provided for in this section shall not then be available, and
38 the receipts for said year from the tax specified in subsection a.
39 of this section shall thereon be considered and treated as part of
40 the General State Fund, available for general purposes.

1 21. Should the State Treasurer, by December 31 of any year,
2 deem it necessary, because of insufficiency of funds to be collected
3 from the sources of revenues as hereinabove provided, to meet the
4 interest and principal payments for the year after the ensuing
5 year, then the treasurer shall certify to the Comptroller of the
6 Treasury the amount necessary to be raised by taxation for such
7 purposes, the same to be assessed, levied and collected for and in
8 the ensuing calendar year. In such case the Comptroller of the
9 Treasury shall, on or before March 1 following, calculate the
10 amount in dollars to be assessed, levied and collected as herein
11 set forth in each county. Such calculation shall be based upon the
12 corrected assessed valuation of such county for the year preceding
13 the year in which such tax is to be assessed, but such tax shall be
14 assessed, levied and collected upon the assessed valuation of the
15 year in which the tax is assessed and levied. The Comptroller of
16 the Treasury shall certify said amount to the county board of taxa-

17 tion and the county treasurer of each county. The said county
 18 board of taxation shall include the proper amount in the current
 19 tax levy of the several taxing districts of the county in proportion
 20 to the ratables as ascertained for the current year.

1 22. For the purpose of complying with the provisions of the
 2 State Constitution this act shall, at the general election to be held
 3 in the month of November, 1977 be submitted to the people. In
 4 order to inform the people of the contents of this act it shall be
 5 the duty of the Secretary of State, after this section shall take
 6 effect, and at least 15 days prior to the said election, to cause this
 7 act to be published in at least 10 newspapers published in the State
 8 and to notify the clerk of each county of this State of the passage
 9 of this act, and the said clerks respectively, in accordance with the
 10 instructions of the Secretary of State, shall cause to be printed
 11 on each of the said ballots, the following:

12 If you approve the act entitled below, make a cross (X), plus
 13 (+), or check (✓) mark in the square opposite the word "Yes."

14 If you disapprove the act entitled below, make a cross (X), plus
 15 (+), or check (✓) mark in the square opposite the word "No."

16 If voting machines are used, a vote of "Yes" or "No" shall be
 17 equivalent to such markings respectively.

CLEAN OCEAN WATERS BOND ISSUE	
Yes.	Should the "Clean Ocean Waters Bond Act of 1976" which authorizes the State to issue bonds in the amount of \$100,000,000.00 for the purposes of researching, planning, acquiring, developing, constructing, improving and maintaining methods and facilities for improving the quality of New Jersey's ocean waters and for providing alternative means which do not utilize the ocean as the repository of wastes, providing the ways and means to pay the interest of such debt and also to pay and discharge the principal thereof, be approved?
No.	Should the "Clean Ocean Waters Bond Act of 1976" which authorizes the State to issue bonds in the amount of \$100,000,000.00 for the purposes of researching, planning, acquiring, developing, constructing, improving and maintaining methods and facilities for improving the quality of New Jersey's ocean waters and for providing alternative means which do not utilize the ocean as the repository of wastes, providing the ways and means to pay the interest of such debt and also to pay and discharge the principal thereof, be approved?

18 The fact and date of the approval or passage of this act, as the
 19 case may be, may be inserted in the appropriate place after the
 20 title in said ballot. No other requirements of law of any kind or
 21 character as to notice or procedure except as herein provided need
 22 be adhered to.

23 The said votes so cast for and against the approval of this act,
 24 by ballot or voting machine, shall be counted and the result thereof
 25 returned by the election officer, and a canvass of such election had
 26 in the same manner as is provided for by law in the case of the
 27 election of a Governor, and the approval or disapproval of this

28 act so determined shall be declared in the same manner as the result
29 of an election for a Governor, and if there shall be a majority of
30 all the votes cast for and against it at such election in favor of
31 the approval of this act, then all the provisions of this act not
32 made effective theretofore shall take effect forthwith.

1 23. There is hereby appropriated the sum of \$5,000.00 to the
2 Department of State for expenses in connection with the publica-
3 tion of notice pursuant to section 22.

1 24. The commissioner shall submit to the State Treasurer and the
2 commission with the department's annual budget request a plan for
3 the expenditure of funds from the "Clean Ocean Waters Fund"
4 for the upcoming fiscal year. This plan shall include the following
5 information: a performance evaluation of the expenditures made
6 from the fund to date; a description of programs planned during
7 the upcoming fiscal year. This plan shall include the following
8 information: a performance evaluation of the expenditures made
9 from the fund to date; a description of programs planned during
10 the upcoming fiscal year; a copy of the regulations in force govern-
11 ing the operation of programs that are financed, in part or in whole,
12 by funds from the "Clean Ocean Waters Fund"; and an estimate
13 of expenditures for the upcoming fiscal year.

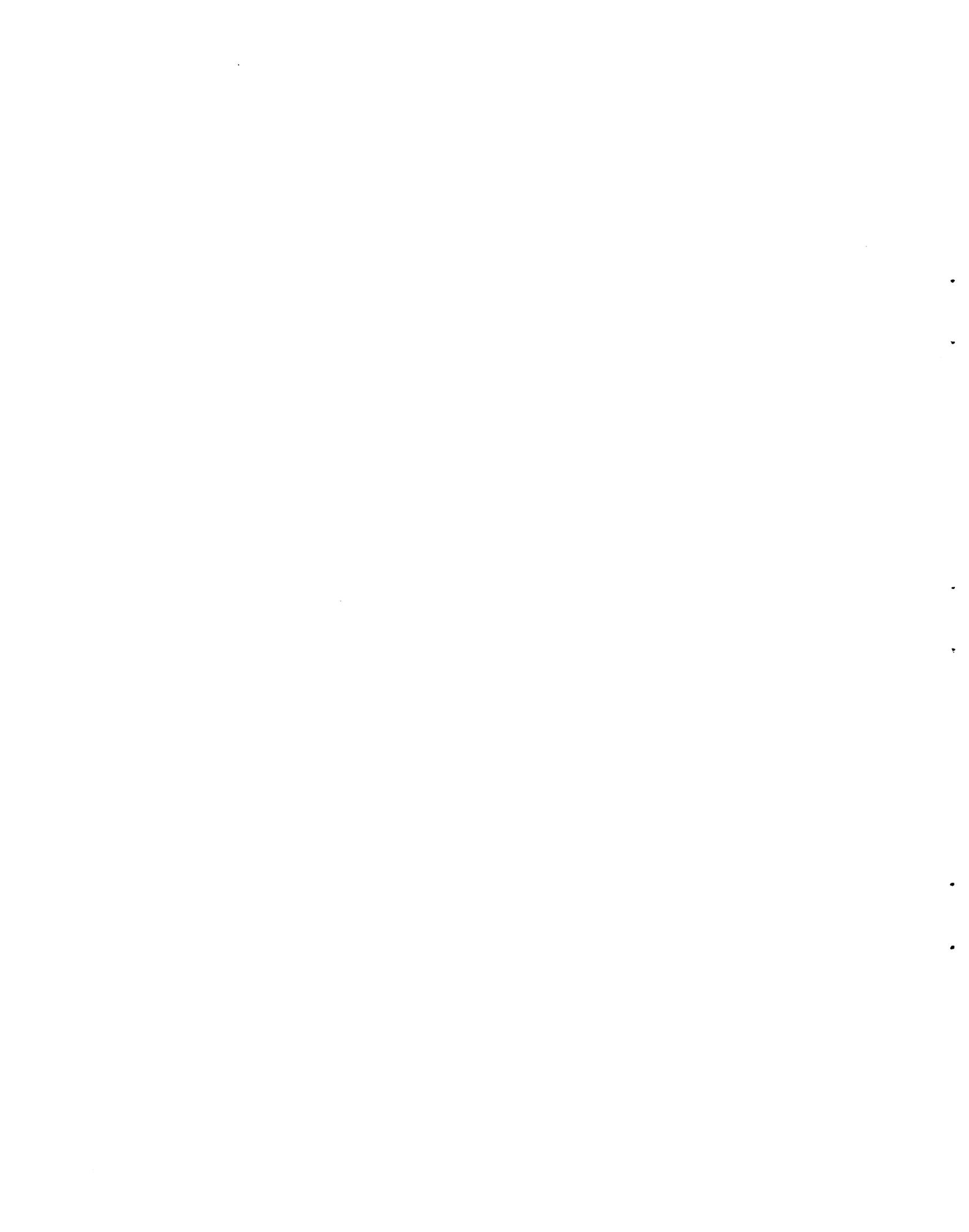
1 25. Immediately following the submission to the Legislature of
2 the Governor's Annual Budget Message the commissioner shall
3 submit to the Assembly Agriculture and Environment Committee,
4 the Senate Energy and Environment Committee and the special
5 joint legislative committee created pursuant to Assembly Con-
6 current Resolution No. 66 of the 1968 Legislature, as reconstituted
7 and continued by the Legislature from time to time, a copy of the
8 plan called for under section 24 of this act, together with such
9 changes therein as may have been required by the Governor's
10 budget message.

1 26. Not less than 30 days prior to the commissioner entering into
2 any contract, lease, obligation, or agreement to effectuate the
3 purposes of this act the commissioner shall report to and consult
4 with the special joint legislative committee created pursuant to
5 Assembly Concurrent Resolution No. 66 of the 1968 Legislature as
6 reconstituted and continued from time to time by the Legislature.

1 27. This section and sections 22 and 23 of this act shall take effect
2 immediately and the remainder of the act shall take effect as and
3 when provided in section 22.

STATEMENT

This bill would provide \$100,000,000.00 through the sale of State bonds to be expended to promote and provide for the clean up of our ocean waters and to provide alternates for ocean disposal of wastes.



ASSEMBLY, No. 2320

STATE OF NEW JERSEY

INTRODUCED NOVEMBER 9, 1976

By Assemblymen VILLANE, BARRY, KOZLOSKI, VAN WAGNER, KENNEDY, Assemblywoman MUIHLER, Assemblymen FAVA, DiFRANCESCO, KUPPERMAN, OLSZOWY, KAVANAUGH, D. GALLO, Assemblywoman CURRAN, Assemblyman MAGUIRE, Assemblywoman MISZKIEWICZ, Assemblymen BASSANO, SAXTON, SNEDEKER, SPIZZIRI, RYS, MARKERT, ALBANESE, WEIDEL, McMANIMON, Assemblywoman SZABO, Assemblymen PERSKIE, HERMAN, GALLAGHER, JACKMAN, ADUBATO, CALL, VISOTCKY, Assemblywoman BURGIO, Assemblymen MARTIN, CHINNICI, PATERO, FROUDE, RAND, SCHUCK and BATE

Referred to Committee on Agriculture and Environment

AN ACT concerning sludge disposal and supplementing Title 58 of the Revised Statutes.

1 BE IT ENACTED *by the Senate and General Assembly of the State*
2 *of New Jersey:*

1 1. One year after the effective date of this act no person shall
2 dispose of any sludge in the ocean or in any of the waters of this
3 State and no person shall load a vessel with sludge for the purposes
4 of transporting such sludge to any disposal site in the ocean or
5 in any of the waters of this State.

1 2. As used in this act, the word "sludge" means domestic or
2 industrial sewage or wastes and the solids, precipitates, and liquids
3 derived during the storage or treatment of said domestic or
4 industrial sewage or wastes.

1 3. Within 90 days of the effective date of this act, any person
2 who is currently utilizing the ocean or any of the waters of this
3 State as a sludge disposal site shall forward to the commissioner
4 or his designated representative a written 1 year projection of
5 the total amount of sludge said person anticipates that he will
6 dispose of at offshore disposal sites; a listing of any alternative
7 methods of sludge disposal that said person may be considering,
8 as well as a written summary of the anticipated economic con-

9 sequences to such persons of the prohibition of offshore sludge
10 disposal 1 year after the effective date of this act.

1 4. The commissioner shall compile a list of sanitary landfills,
2 of landholders, and of any other persons who, currently, accept
3 sludge, whether treated or untreated, for disposal or treatment
4 and the commissioner shall circulate such list to those persons who
5 now dispose of sludge in the ocean or waters of this State.

1 5. The commissioner shall designate a number of regional treat-
2 ment centers for the processing of sludge, hereinafter referred to
3 as regional treatment centers, from among the existing regional
4 sewerage agencies, solid waste disposers, new and existing landfill
5 sites, solid waste or sewerage treatment or disposal facilities, or
6 any other agencies or persons, whether public or private, who are
7 capable of disposing of sludge on a long term basis in an environ-
8 mentally and economically sound manner.

9 The number and location of such regional treatment centers shall
10 be determined by the commissioner in accordance with the following
11 criteria:

12 a. The availability of new and existing facilities and their
13 proximity to potential users;

14 b. The anticipated quantities of sludge to be processed by the
15 proposed regional treatment center;

16 c. The anticipated economic and social constraints involved in
17 the designation of any given new or existing facility as a regional
18 treatment center.

1 6. The commissioner shall vigorously pursue all Federal, State
2 or private aid which is available or may become available for sludge
3 disposal and shall coordinate such aid requests as may be forth-
4 coming with the appropriate State, county and local agencies and
5 authorities.

6 Facilities designated as regional treatment centers shall be
7 favored in the distribution of any Federal, State or private aid
8 which is available and shall be required to accept the sludge of
9 smaller adjacent sewerage agencies for processing.

1 7. The commissioner or his designated representative shall
2 coordinate and control:

3 a. The continued maintenance and enforcement of all new or
4 existing rules and regulations promulgated pursuant to law pertain-
5 ing to the offshore disposal of sludge, as well as the vigorous
6 pursuit, as may be provided by law, of any violations of such rules
7 and regulations;

8 b. The continued monitoring of all landfill sludge disposal
9 methods to insure that such landfill sludge disposals will not
10 endanger the health and safety of the citizens of New Jersey
11 affected thereby and that all sludge disposal methods comply with
12 existing State laws and any rules and regulations promulgated
13 thereunder;

14 c. The development of long range plans for sludge disposal in
15 the State of New Jersey which take into consideration:

16 (1) Population trends in terms of numbers and movement,
17 including suburban and rural migration patterns and their effects
18 upon landfill sites;

19 (2) Alternate methods of sludge disposal, such as pyrolysis
20 incineration, the combined processing of solid waste and sludge,
21 landfilling, the land application of wet or dry sludge, and com-
22 posting, or any other socially and economically useful and environ-
23 mentally acceptable method that currently exists or may become
24 available;

25 (3) Periodic evaluations and analyses of the economies of using
26 the regional treatment center approach to sludge disposal.

1 8. Within 6 months of the effective date of this act the commis-
2 sioner shall complete each step required herein and shall report
3 to the Legislature the current and projected methods of sludge
4 disposal, the current and anticipated measures employed by persons
5 utilizing offshore sludge disposal sites in meeting the time con-
6 straints imposed by section 1 of this act, and whatever recom-
7 mendations the commissioner believes appropriate for legislative
8 action to expedite the solution of the sludge disposal problem.

1 9. The commissioner shall have, and is hereby vested with, the
2 authority to grant temporary relief from the provisions of this
3 act to persons who can demonstrate a severe financial hardship,
4 or who cannot be accommodated in their sludge disposal require-
5 ments by existing facilities, or who, in the judgment of the com-
6 missioner, should be granted a time extension on the time
7 constraints imposed by section 1 of this act. In no case shall any
8 time extension or temporary relief from the provisions of this
9 act be granted for a period longer than 1 year. Any such temporary
10 relief or time extensions granted to any person shall be reported
11 by the commissioner to the Legislature forthwith, stating the
12 reasons compelling such action, as well as the anticipated date upon
13 which the provisions of this act will be complied with by said
14 person.

1 10. The commissioner shall make and promulgate, pursuant to
2 the provisions of the "Administrative Procedure Act," P. L. 1968,
3 c. 410 (C. 52:14B-1 et seq.), whatever rules and regulations not
4 inconsistent with any provisions of this act which he deems neces-
5 sary and appropriate for the timely effectuation of the purposes
6 of this act.

1 11. The commissioner shall promulgate pretreatment standards
2 for sewage, pursuant to P. L. 1972, c. 42 (C. 58:11-49 et seq.),
3 which require the removal of heavy metals, nutrients and toxic
4 substances.

1 12. This act shall take effect immediately.

STATEMENT

This bill would prohibit the disposal of sludge in the ocean and in any waters of this State 1 year after its enactment into law. During the interim, the Department of Environmental Protection will designate certain new or existing sewerage agencies and waste disposal facilities as regional treatment centers, and direct persons utilizing offshore sludge disposal sites to convert to their use.

The objective of this legislation is to accomplish a complete elimination of offshore sludge dumping within the next year. The Commissioner of Department of Environmental Protection, however, shall have the authority to grant time extensions to users in hardship situations. Such time extensions shall not exceed 1 year and must be reported to the Legislature in all cases.

This legislation recognizes that short term alternatives to offshore sludge disposal will depend, in part, on heavy utilization of sanitary landfills. It further provides procedures for determining long term disposal strategies, which will include, among other things, the use of sludge as a medium for growing plants, and, possibly, the use of sludge in combination with other solid waste to produce energy, as well as other means of disposal utilizing new or existing technologies. The bill recognizes the regional nature of the problem by requiring the Commissioner of Department of Environmental Protection to designate regional treatment centers for sludge processing, which would be favored for the receipt of Federal, State or private aid and which would be required to process the sludge of smaller adjacent sewerage agencies. The bill requires the commissioner to promulgate pretreatment standards for the removal of heavy metals, nutrients and toxic substances, from sewage.

ASSEMBLY, No. 2357

STATE OF NEW JERSEY

INTRODUCED NOVEMBER 23, 1976

By Assemblymen VAN WAGNER, FLYNN, NEWMAN, DOYLE,
KOZLOSKI, OTLOWSKI, PERSKIE, KARCHER, HAMILTON,
COSTELLO and VILLANE

Referred to Committee on Agriculture and Environment

AN ACT to supplement the "Solid Waste Management Act," ap-
proved May 6, 1970 (P. L. 1970, c. 39, C. 13:1E-1 et seq.).

1 BE IT ENACTED *by the Senate and General Assembly of the State*
2 *of New Jersey:*

1 1. a. The Legislature hereby finds that the current practice
2 of ocean disposal of sludge is, to a large degree, responsible for
3 the degradation of the coastal waters of this State and the serious
4 environmental and economic problems related thereto; that such
5 degradation and problems will be aggravated by a continued reli-
6 ance upon this practice to the point of being virtually irreversible;
7 that land disposal methods and new technological processes now
8 make it feasible to minimize the adverse effects of sludge while
9 deriving useful products therefrom; and that the health, safety
10 and welfare of the citizens of this State now require that such
11 methods and processes replace the practice of ocean disposal of
12 sludge.

13 b. The Legislature further finds that the efficient and reasonable
14 management of solid waste and sludge are inherently compatible;
15 that the recycling of solid waste and the processing of sludge into
16 energy, fertilizers and other useful products are complementary;
17 that State programs which seek to provide for comprehensive
18 approaches to the proper disposal or utilization of solid waste or
19 sludge must be regional in nature; and that the interests of the
20 citizens of this State would best be served through an integration
21 of sludge management with the regional solid waste planning and
22 management process.

23 c. The Legislature, therefore, declares that it is the policy of
24 this State to supplement the regional objectives of the "Solid
25 Waste Management Act," P. L. 1970, c. 39 (C. 13:1E-1 et seq.),

26 by requiring that the solid waste management districts established
27 therein plan and provide for the processing or land disposal of
28 sludge in the manner and extent hereinafter provided.

1 2. As used in this act:

2 a. "Sludge" means the solids, precipitates and liquids, other
3 than effluent, which are produced as a result of the storage or
4 treatment of domestic or industrial sewage.

5 b. "Processing of sludge" means the use of sludge for the
6 production of energy, fertilizer or other useful materials.

7 c. "Land disposal" means the disposal of sludge at a sanitary
8 landfill or the application of wet or dry sludge on agricultural,
9 park or institutional lands in a manner which conforms to the
10 Statewide solid waste management plan and the solid waste
11 management plan for the district wherein such disposal or applica-
12 tion occurs.

13 d. "Effluent" means liquids which are treated in, and discharged
14 by, public sewage treatment plants.

1 3. The solid waste management plan developed and formulated
2 for every solid waste management district in this State pursuant
3 to sections 11 through 15 of P. L. 1975, c. 326 (C. 13:1E-20 to
4 13:1E-24) shall provide:

5 a. An inventory of the sources, composition, and quantity of
6 sludge presently generated within the solid waste management
7 district;

8 b. Projections of the amounts and composition of sludge which
9 will be generated within the district in each of the subsequent
10 10 years;

11 c. An inventory and appraisal, including the identity, location
12 and life expectancy, of any solid waste facility or recycling facility
13 located within the district which could be utilized for the processing
14 or land disposal of sludge;

15 d. An analysis of the present systems of sludge disposal for
16 the district;

17 e. A statement of the sludge disposal strategy to be applied in
18 the district, which strategy shall provide for the maximum
19 practical processing of all sludge generated within the district
20 following the adoption of the solid waste management plan by such
21 district and for the land disposal of any such sludge deemed im-
22 practical for such processing;

23 f. A site plan, which shall include all existing solid waste facilities
24 or recycling facilities which could be utilized for the processing or
25 land disposal of sludge, provided that they are operated and
26 maintained in accordance with all applicable health and environ-

27 mental standards, and sufficient additional available suitable sites
28 to provide for the processing or land disposal of the amounts of
29 sludge presently generated within the district as well as the
30 amounts of sludge projected to be generated in each of the sub-
31 sequent 10 years.

1 4. a. The Statewide solid waste management plan developed
2 and formulated by the department pursuant to section 6 of the act
3 to which this act is a supplement shall provide for the maximum
4 practical processing of all sludge generated within the State follow-
5 ing the adoption of such plan, and for the land disposal of any such
6 sludge deemed impractical for such processing.

7 b. The department is hereby empowered to direct any solid
8 waste management district, pursuant to the Statewide solid waste
9 management plan, (1) to plan for the utilization of any existing
10 solid waste facility or recycling facility for the land disposal or
11 processing of sludge, or (2) to develop a program, singly or with
12 one or more other districts, to provide for the land disposal or
13 processing of sludge generated within such district or districts.

1 5. All sludge generated within the boundaries of any solid waste
2 management district in this State shall be disposed of in a manner
3 which conforms to the Statewide solid waste management plan
4 and the solid waste management plan for the district wherein such
5 sludge is generated.

1 6. This act shall take effect immediately; provided however,
2 section 3 shall be implemented pursuant to the following schedule:

3 a. Immediately, with respect to any solid waste management
4 plans not due to be submitted to the commissioner within 120 days
5 of the effective date of this supplementary act; and

6 b. Two years, from the effective date of this act with respect
7 to any other solid waste management plan.

STATEMENT

The adverse environmental and economic effects of the ocean disposal of sludge were forcefully demonstrated by the algal bloom, fishkills and fouled beaches which have plagued the coastal areas of our State during the last 6 months. Analysis of these problems has shown that sludge is a contributing factor to the nutrient buildup now held responsible. Since that time, considerable public attention and pressure have concentrated on alternatives to the ocean disposal of sludge.

This bill would provide the statutory framework and mandate for the land disposal and processing of sludge. Land disposal of

sludge, either in suitable sanitary landfills or through application on agricultural, park or institutional lands, would do much to minimize the adverse effects of sludge disposal. The processing of sludge would, in addition, provide useful by-products such as energy and compost.

As a means of accomplishing these beneficial results, this bill recognizes the inherent compatibility of the proper disposal and utilization of sludge and solid waste. Many of the innovative processes now in use, or being considered for use, in the production of energy, fertilizer, or other useful materials from solid waste would be complemented by the addition of sludge. In addition, recent legislation has already provided for a regional solid waste planning and management process to be conducted by each county, the Hackensack Meadowlands and the State. This bill, then, would provide for the integration of sludge planning and management with that solid waste planning and management process.

Accordingly, this bill would supplement the "Solid Waste Management Act" P. L. 1970, c. 39 (C. 13:1E-1 et seq.) by requiring every solid waste management district and the State to plan and provide for the processing or land disposal of sludge pursuant to the district and Statewide solid waste management plans. Such a requirement would facilitate the proper disposal and utilization of both solid waste and sludge.

The provisions of this bill would implement recommendations concerning the regional processing of sludge contained in recent reports of the Interstate Sanitation Commission and the New Jersey Department of Environmental Protection.

SENATOR JOHN F. RUSSO (Chairman): We will begin. I am Senator John F. Russo of Ocean County, the Chairman of the Senate Energy and Environment Committee, and to my left is my colleague on the Committee, Senator Joseph Mc Gahn of Atlantic County. To my right is an Assembly representative of the Assembly Committee, Assemblyman Walter Kozloski of Monmouth County. To his right - I am sorry, I skipped him - is Senator Barry Parker of Burlington County also a member of the Senate Energy and Environment Committee. To the far right is David Mattek, our Committee Aide.

These are joint hearings on bills that basically pertain to ocean pollution. I won't go into any history of the problem. You are all aware of it, or you wouldn't be here. You know what happened to our ocean last summer, and you know what has happened in the past and what our concerns are.

Basically, these hearings will focus upon a series of bills that are pending before the Senate Energy and Environment Committee, concerning which we will have to vote on release, favorably or unfavorably. If they are released, they will have to go to the full Senate for consideration; and if they then pass, they will have to go to the Assembly for a similar consideration by the Assembly Energy and Environment Committee, and then the Assembly body as a whole, and then if they pass there, to the Governor.

The purpose is to obtain testimony to give us further information to aid us in determining which, if any, of these bills should be released for a floor vote in the Senate. The bills that we are concerned with today, very briefly, are Senate Bill Number 1804, sponsored by myself and co-sponsored by Senators Buehler of Monmouth County and Mc Gahn of Atlantic County, which basically in a nutshell is similar to the oil spill liability compensation fund that was passed this year. This would create a sludge liability compensation fund to compensate those harmed by sludge or ocean pollution in general, and also provide some funds to remedy any problems that may arise. We will get into that bill more later.

A second bill will be explained by its sponsor. That is a bill sponsored by Senator Parker, co-sponsored by Senators Beadleston, myself, Zane, Cafiero, Vreeland, Imperiale, Mc Gahn, Buehler and Davenport. That is a bond issue bill with regard to ocean pollution, and Senator Parker will explain that a bit later.

The third bill is Assembly Bill Number 2320 sponsored by Assemblyman Villane and a number of other Assemblymen. Assemblyman Villane is here and will testify early in the proceedings and explain his bill that is before us.

Next is Assembly Bill Number 2357 by Senator Van Wagner and others, an act to supplement the Solid Waste Management Act. Assemblyman Van Wagner has indicated that he will be here.

There is a further bill S-1659 by Senators Parker, Russo, and Vreeland, supplementing the Clean Ocean Act, and that will be explained by Senator Parker. I think I have covered the bills that are before us today, and I do not feel at this time it is necessary to make any further statement as Committee Chairman, or any comment regarding the bill that I have sponsored that is before us. We will get into it as we go along.

However, before we get to the first witness, if there is any other member of the Committee who wishes to make any opening statement, you are certainly welcome to do so. Is there anyone?

In that case, we will accommodate Assemblyman Villane who has requested that he be called early in the proceedings so that he can return to his practice. We will start with Assemblyman Villane.

A N T H O N Y M. V I L L A N E, JR.: Thank you, Senator Russo. I would like to say first that this is a great approach to working out the bills both for the Senate and the Assembly, and I think all four of these bills have merit, and I will speak on my bill particularly and tell you what the intent is.

I would like to also thank the Senate for acting on Senate Resolution 36 that created a Senate Committee that mirrors my Assembly Bill Number 32. Senator Russo, what that bill did about nine months ago was to create a bi-state agency with New York and New Jersey for the first time, and that bi-state agency that we now have includes four Assemblymen from New York, and four Assemblymen from New Jersey, and now it is joined by four Senators from New York and four Senators from New Jersey. It is the first time that we have approached the problem on a bi-state basis. In my experience, this is the first time we have had so much cooperation from the people in New York. We have gotten great input from their Assemblymen.

As you know, this problem that we address in New Jersey probably represents about 35% of New Jersey's waste contaminating the ocean, and about 65% of New York's, so it has been the contention of my Committee, from the very beginning, that we must approach this problem on a joint basis.

It is interesting to note that probably 90% of all the waste that is dumped in the ocean is dumped in the New York Bight; 90% of the waste anywhere in the United States is dumped right here off our Atlantic Coast. And you representatives from as far down as Atlantic County, and all the way up north, to my county, I think, bear the brunt of it from our constituents. I am happy to see the kind of input we have had, and I think that we are really getting to the nitty-gritty of this problem. We are now getting to the serious parts of the case.

The history of the activities of this bi-state agency, just so the Senate knows, and perhaps we have been remiss in not sending you a periodic report, is that we have had three meetings so far. At our first meeting we called in all the Federal, State and bi-state agencies to testify. At that original meeting that was held in New York City at the World Trade Center, with the stipulation that nobody on the Committee could use the bathrooms, because we didn't want to pollute up there, the Committee called in the Federal EPA, the State of New York EPA, the City of New York EPA, and the Bi-State Sanitation Commission. At that meeting we had testimony from all of those agencies. The only one that was missing was the New Jersey agency, and something got fowled up and they didn't show. But the input from that Committee at that time was that, yes, we were all trying to eliminate sludge dumping, but we were all going off in a different direction.

And to be honest with you, the residue that resulted from that is, we do not have a planned procedure to phase out sludge dumping by 1981. We also got tremendous input from the Bi-State Sanitation Commission telling us that the sludge is not the only problem. They said that dredge spoils are a large part of the problem, and from that information, we decided that perhaps after being in the public sector that we would go to the private sector.

Our second meeting was held at the Sports Complex in New Jersey, and we had the New York people come, and we had everybody from New Jersey there - incidentally, Mr. Kozloski is a member of that Committee. We called in private

industry, marine biologists, chemists, technical people, manufacturers of sludge equipment. There is no lack of equipment to handle the sludge processing. There are a tremendous number of people who manufacture the things that we need in the State of New Jersey. Incidentally, they are used all over the world. They have been used all over the world for ten or fifteen years. We have companies in the State of New Jersey that manufacture turnkey operations to handle sludge.

One of the problems we have in New York and New Jersey is that it is too cheap to dump in the ocean. One of the bills today addresses that issue. That is why we are dumping in the ocean, because it is too cheap. It is more expensive, perhaps, to put in a plant that can handle the sludge, and it may be more expensive at the moment to put the capabilities at the sewer plants to dehydrate sludge, rather than cart millions of tons of sludge out into the ocean, but that practice has to be stopped. I have heard arguments from everybody as to why it shouldn't be stopped, but in all truth and in all reality, you can't use the Atlantic Ocean for a septic tank. You can't do it. You can't do it for yourself, and you can't do it for your children, and you can't do it for the economy of the State of New Jersey. We act in a medieval, archaic way in a modern society. It used to be that we dumped raw sewage into the Atlantic Ocean. Now we have refined the art, and what we do now is we separate. We put the effluents out in the ocean through a pipe that goes up a couple of hundred feet or a thousand feet, or whatever; we take the solid waste, we truck it up to New York, or we truck it out by a barge, and we dump that solid waste in the form of sludge out in the ocean.

So what we have done with the introduction of billions of dollars into sewage treatment plants is to separate them and put the end products of the sewage treatment plants back into the ocean. Now, that is not much of a refinement, as far as I can see it. What the missing link is, Senator, is the ability to handle the sludge, to treat the sludge, to recycle the sludge, precipitate it, dry it, landfill it, pyrolysis, to create composting sites, and that is where, I think, our problem has been.

Incidentally, most times in the State we fight primarily vested interest groups. We are not fighting a vested interest group here. We are not fighting a profit agency on the surface. We are fighting the agencies that are supposed to protect the people, and I maintain that the agencies have not provided for the land sites, the composting, the pyrolysis. We have not done it. There are just a few people who have the mechanics and the hardware to do that. There are people who manufacture these plants. These are readily available. We do not have one plant like this in the State of New Jersey. Incidentally, we have a landfill site in Monmouth County at the present time that can accept dry sludge.

In Ocean County, and I spent some time down at your sewer plant up in Mantoloking, there is an outstanding, beautiful plant. They have the capability to dry, and that will be one of the first plants, when they accumulate enough sludge --- And incidentally, it isn't a whole lot that is generated down there at the moment, but when it is, and when it is dried and that plant has the capability, that plant can landfill, because it doesn't contain the heavy metals. And I have checked with the chemist at that particular plant on this.

Many of our plants that we pay large numbers of dollars to in sewer fees have not even started to investigate the drying capabilities, and that, I think, is a major problem.

Just so everyone will know, tomorrow morning at eleven o'clock, we are having our third meeting of the Bi-State Ocean Pollution Control Committee of New York and New Jersey. That meeting tomorrow is addressing the third portion of the problem. The meeting is in Sandy Hook, and we are going to call in the Coast Guard in order to question them as to just what the surveillance is. Through some of the research that my staff - Algis Matioska is here, my staff member - has done, we have found out that there is just about no policing - just about no policing - of what is dumped in that Atlantic Ocean. We have people here from industry today, and I can tell you, out of the 6,000 dumpings at the 106-mile site, about 7% of all of those dumpings were either observed or accompanied by a ship rider. At the sludge dumping site, they call it observation surveillance. If they see a boat leaving and coming, they call that surveillance.

The EPA has neglected its duty, because they have modified the laws of 1972, and I can tell you honestly they are in violation of State statutes, Federal statutes. They do not let them dump their sludge, and according to bioacade recommended times. And the reason why they have relaxed the standards is because they said at the twelve mile site it is a hazard to navigation. Now, that is a wonderful thing. A hazard to navigation is the reason why we have to close beaches because of a polluted ocean. Well, we are actually killing the entire ocean. We are living in a period that has to be looked back on as a period of ignorance, as far as the treating of the human race. It is the most universal problem in the world. Every single person contributes to the problem and we have not, as intelligent legislators or as intelligent environmentalists, been able to address the problem properly.

Just to round the discussion out today, the future plan of the Committee is to assimilate all the material we have had, both from the public sector, and the private, and the official agencies that are supposed to control the dumping of sludge, and also from the Coast Guard, to find out who is the prime violator for what is being dumped into the Atlantic Ocean. The dredge spoils that are dredged up from the harbors of the states of New York and New Jersey represent about 35% to 40% of the pollutants, and the nutrients, and the poisons that get dumped, not even twelve miles off the Atlantic Coast, but even closer than that.

We have not addressed the problem, and after the hearing tomorrow, I will have a hearing of my Committee, a workshop session. I cordially invite you, Senator, to this session. I think that our approach after that is delination of the problem, and what I will call for is joint legislative action of the Federal Senate, the Congress, for a meeting in Washington with the President of the United States. We have had commitments from the President during his campaign about his concern about the water quality standards, and I think what we have to do is have a coalition of the people that are responsible for the welfare of the people of the State of New Jersey, our elected officials. And I would like to see this Committee, and my Committee, and all the Congressmen and all the Senators from the states of New York and New Jersey go to Washington and really lay these cards on the table. That is about the history of it.

I would like to tell you now ---

SENATOR RUSSO: Before you get to your bill, Tony, I wonder if I might ask you a couple of questions and sort of put the problem in perspective. You suggest that we are merely dumping into the ocean because it is a cheaper

place to go, and that there is a feasible alternative, and by feasible I mean, and perhaps I am assuming more than you intended to say, economically as well as practically feasible. All we have to do is treat this properly, dry it and dump it in landfills, and that in spite of an obvious alternative that is there, and that is feasible and reasonable, nevertheless, we are still dumping in the ocean. Would this be correct?

ASSEMBLYMAN VILLANE: That is more correct than not correct, Senator. I will give you an example. It is cheaper, for instance, now for the Monmouth Regional Sewerage Authority to take their sludge down a river in a river barge that can't navigate ocean waters out twelve miles, but then he must transfer from a river-navigable barge to an ocean-navigable barge, and it costs about \$1.3 million to do it.

It is cheaper now for them to do that than it is for them to put in drying capabilities at that plant and to put that sewage, which incidentally doesn't contain the contaminants of heavy metals, in a landfill site. That can be eliminated immediately.

Your bill calls for a charge on sludge dumpers at \$1 per cubic foot for the first year, and an increase of double that in the second year, and that bill is a good bill, because it is going to make people look at alternatives. It will force them to look at alternatives. What we have said, interestingly throughout the history of the environment of the United States, is that we don't want air pollution. And do you know what? The manufacturers of automobiles never address the problem. What they did was build cars with greater horse power - and that is what their advertising campaign was - which gives higher pollutants to the air.

Until some legislature got wise to them and said they were going to enact a law that you must put anti-pollutant equipment on your automobiles, they would have continued this practice. They said they couldn't do it, and do you know what? They did it. And I think it is our responsibility as legislators to force the issue.

The Federal Government said in 1970, seven years ago, that the dumping of pollutants and sewage waste and other things in the ocean is contaminant and hazardous to the population of the United States and to the sea life and everything else. They said that in 1970, which precipitated the act of 1972, which we now operate on, which has been watered down over the years by the agencies themselves. Not only that, but, now, seven years later, they tell us in 1977 that they don't think they are going to be able to meet the deadlines of 1981. Senator, they are not going to be able to meet the deadlines, because you can't tell me, and Walter Kozloski can't tell me what alternatives we are preparing for those people. Senator, in 1976, we dumped 5.7 million wet tons of sewage sludge in the Bight area. The projections by EPA are 11.5 million tons in 1981. Without alternatives, without phase-in programs, without dump sites, pyrolysis sites, composting sites, there will never be an end to sludge dumping. Because as we approach the date, they will change the date, and as we get more sewer plants operating, we are going to generate more sludge. So I say again to you, Senator, that it is the responsibility of the Legislators to force the issue, to play the hand. We are not fighting industry, primarily; we are not fighting vested interest groups; we are fighting agencies that represent people, and to put it quite frankly, we have to get them off their duff, and my bill, 2320, does exactly that, sir.

SENATOR RUSSO: You have indicated, and I think you are quite right, that the majority of the problem we are concerned about is not industry, it is really the municipalities and public groups. Assuming, as I do, that is correct, can you give us an indication, based upon the extensive work your Committee did, what percentage of our ocean pollution problem is coming from these public bodies as distinguished from private industry?

ASSEMBLYMAN VILLANE: That is an interesting question, and the answer to that question, when I give it to you, is probably going to surprise some people. The pollutants that are dumped in the Atlantic Ocean as a result of sewage sludge represent about 3% to 5% of the problem, a minor portion of it. But, Senator, I think that 5% or 3% has been the straw that has broken the camel's back. I think that our jurisdiction over what is being done in the Atlantic Ocean centers around what our municipal sewer plants do and where they dump. And we have the approach. That is a very small percentage, Senator.

SENATOR PARKER: Your figures differ from mine, Doctor. My understanding is, from the figures that I have seen, that sludge is 20% of the problem. They have five major sources, sludge, raw sewage, dredge spoil, agricultural runoff and industrial waste, which all amounts to 20% of the problem.

I don't have all my figures here, but when you said 3% to 5% of the sludge, that doesn't coincide with my understanding of that problem.

ASSEMBLYMAN VILLANE: There is somebody here today that I think can clear that up for us later on. We ought to get those figures together. But what I am saying is, whatever that number is, it doesn't represent the major portion of it. The major portion of the pollutants that cause the nutrient problem, and also the heavy metals, the cadmium, the mercury and the lead that are killing our fish and actually poisoning the waters in the Atlantic Ocean, come from the dredge spoils. I think that is the second thing we will get to.

I think the third thing we are going to get to is the chemical dumping. I know there are people here from industry, and I have talked to them, and I can appreciate the research they put into it, but they cannot dump in that ocean to poison the water in another area. The Atlantic Ocean was never meant to be a dump site. What we have to do in industry, and what we have to do in the public sector, is to find the efforts to recycle. It sounds like a dream, but most things happen as a result of a dream. And those things can be done.

They talk about the large investment that it is going to take. There is no large investment that can compare with the loss of an Atlantic Ocean. The Federal Government should address the problem of the Atlantic Ocean like we do the welfare problem, the transportation problem. They should address that as a utility, as a social cost. There is no way to buy an Atlantic Ocean back. There is no way to put lobsters in beds where they can't live, or oysters or fish.

SENATOR RUSSO: Have I sidetracked you?

ASSEMBLYMAN VILLANE: Just a little bit, Senator, but I think when the Bi-State Sanitation Commission testifies, I think they will clear up the point about exactly what the sludge problem is. But I maintain that no matter how small it is, that may be the straw that broke the camel's back, that changed the nutrient level. It caused the temperature inversion in the thermalcline level. It is the area we can address most intelligently as legislators within the State of New Jersey and solve the problem. At one point, I got so frustrated

I thought that maybe the State of New Jersey ought to have their own Navy. They say the only way to survey the Atlantic Ocean is to have helicopters. Well, if that is what we need, that is what we ought to do. If you were to fly over that area, you would see guys blowing their bilge out, going up the Atlantic Coast, dumping garbage in the ocean. We have gotten reports 100 times about sludge dumpers who dump short. Incidentally, Senator, in the last three years of sludge dumping and chemical waste dumping, in the Atlantic Ocean, there have been 43 charges of violation. Out of the 43 charges - which, incidentally, carry a fine up to \$50,000 - of violation there have been three convictions in three years. That is unbelievable, and it should not be believed.

We then go beyond the problem of municipal waste and things like that. We have to get into surveillance and things that will protect the citizens of the State of New Jersey. The Coast Guard - and I will say it in their defense - does not have the personnel. The Coast Guard does not have the equipment. The Third Region Coast Guard now has been given the obligation of policing the 200-mile limit. Well, do you know how much attention short dumpers or long dumpers or people without permits are going to have? They are not going to have any attention at all.

Another thing that I ought to tell you is that through my investigation, the barge owners and the sludge haulers call their own shots. They tell people what it is going to cost to dump. Incidentally, the major sludge haulers and sludge dumpers bid to handle contracts, so there is a true bidding, and there is a true competition with those sludge haulers. There are three or five major sludge haulers that bid in contract, and I think that is an area we should address.

I can't stress to you any more the importance that we should address to the bi-state problem. The people in New York are willing to cooperate. True, that state is in financial trouble, but the people of New York are just as concerned as we are. The Arthur Kill has been made a wasteland, a dead river. Their beaches have been closed. Look at the beaches down along the New York side. They have suffered the same thing we have.

Senator Parker, you are on the new Senate Committee, and I hope---

SENATOR PARKER: That is news to me. I didn't know that the Senate had joined with the Assembly Committee. We had recommended it, but I didn't know it had been done.

ASSEMBLYMAN VILLANE: There was a piece of legislation that was passed about one month ago, and yesterday you were named to the Committee, along with Senator Mc Gahn.

SENATOR PARKER: Well, you are telling me something I didn't know.

ASSEMBLYMAN VILLANE: Congratulations. It is good to have you on the Committee. We need a big fellow like you. It was nice to see that bill passed in the Senate. We need it. We got it in the Assembly and now we have the Senate Committee.

Are there any other questions, Senator, before I get into the bill? I will be happy to answer anything, because I have a lot of material here.

SENATOR MC GAHN: Mr. Chairman, simply as a matter of clarification, you were queried by Senator Parker concerning the percentage figures. As far as algae is concerned, Assemblyman Villane is correct, about 5% comes from sewage sludge disposal sites, and about 2% from the ocean dump off the Atlantic Coast.

I think the difficulty that Senator Parker has is with the statement as far as waste water is concerned. That constitutes approximately 30% of the total nutrient build-up.

ASSEMBLYMAN VILLANE: Senator Parker is right, because in the effluent that we put out into the ocean, we are talking about 95% pure water, and I think the residuals in that do contribute somewhat to the pollution. I don't know that there is any solution to that, except that we get into finer refinement of the water portion of the sewage sludge.

SENATOR MC GAHN: Incidentally, as we upgrade water quality in the State, as far as waste water is concerned, the percentage of sludge increases.

ASSEMBLYMAN VILLANE: No question about it.

SENATOR RUSSO: Are there any further questions before Assemblyman Villane proceeds with his bill?

ASSEMBLYMAN VILLANE: I would like to, if I may, Senator, review a couple of things that are important in the consideration of these four bills. Senator Parker has a bill here that calls for \$100 million bond issue, and that bill was co-sponsored by you, Senator Russo, and by Dr. Mc Gahn, and that bill is an admirable one. I think that we are approaching the oil spill problem, and that this perhaps will address the sewage problem.

However, this bill does not affect New York. I think that it addresses the problem just like the oil spill does. It addresses the problem after the fact, and we need probably to address that problem where people have had a loss of income due to sludge and sewage waste, and pollution of the water. Senator Russo, you have a bill, sir, that includes materials that are not limited to sewage sludge waste, chemical waste, rubble and dredge spoils. There is no way that the State of New Jersey can control what the Corps of Engineers is doing in that particular portion of your bill. I like this bill very much in that it does provide for a fee schedule; it will get people off dead center and get them moving in the right direction. However, I would like to point out that the bill does include dredge spoils, and through legislation of the State of New Jersey, I don't think we have any recourse to the Federal dumpers who are dredging the waters in our coastal waterways.

SENATOR RUSSO: Which section is that?

ASSEMBLYMAN VILLANE: That, sir, is 1804; it is section 1, line 17 where you define what the materials include. They include but are not limited to sewage sludge, acid waste, chemical waste, rubble and dredge spoils. I wish, sir, that we could include that in our legislation, and maybe we can rewrite a portion of this somehow, but I would make that recommendation to you.

SENATOR RUSSO: Your suggestion is that dredge spoils can't be included under State jurisdiction? And that is the reason why you feel it ought to come out of this particular bill?

ASSEMBLYMAN VILLANE: I would like, if you could, Senator, to devise a way to write it into the legislation, so that we could say that dredge spoils could not be dumped twelve miles or fifteen or twenty miles off the coast of New Jersey. I don't know how we can as State legislators. Our jurisdiction doesn't go there, but I think that would be appropriate. It does contain a revised fee schedule, and permits, and I think that is a good way to address it. It will not make the ocean the least expensive place to dump.

It does provide for technical and financial assistance, and I think that is a good way to address that problem.

The Van Wagner bill amends the solid waste problem, and Assemblyman Van Wagner and I worked together on many of our pieces of legislation. I think this is a different approach. I also think that the solid waste is probably an extension of our committee's activities - not this year - but it should be the next thing that we should attack and get some answers to. We should address the sludge problem - get legislation enacted in the State, and get the thing done accurately. I would not like to see it tied into a solid waste program, and I think there would be some great objections to including sewage sludge in solid waste, although there are systems available in the world today that combine those two techniques and actually create landfill and fertilizer from those two things. I think that our problems are so immediate in the State of New Jersey that we must address presently the sludge problem.

To get to my bill, incidentally, we have three more sponsors on the bill since we wrote the bill, and I think we have about 43 or 44 sponsors. The bill says that within 90 days of the effective date of the act that all sludge dumpers shall have a written projection of what one year's total amount of sludge they anticipate will be dumped.

Further, it designates sites. It says that the Commissioner of the DEP of the State of New Jersey shall compile a list of sanitary landfills and then the Commissioner shall designate a number of regional treatment centers for the processing of sludge, hereinafter referred to as the Regional Treatment Center. That is not to say, Senator, that every regional site shall be a composting site. It is not practical, and it is not to say that every site shall be a pyrolysis site; and it is not to say that every site shall be a radiation site. But it does say that the Commissioner shall designate a number of regional sites. I think that probably when we get to the solution, it will be a combination of those kinds of things spread out over the State of New Jersey which is so diverse from Cape May to Sussex County.

In some areas where we have the land to do it, a compost will be fine, and in some areas where we don't have so much land, we will probably get into pyrolysis or radiation. In this bill, Senator, it calls for the criteria by which these sites shall be picked. It also says that the Commissioner shall vigorously pursue federal, state, and private aid which will become available to these sludge dump sites.

It does say in another section that the Commissioner or his designated representative shall coordinate and control in the continued maintenance and enforcement of this problem, so that we don't slip back into our evil ways. It calls for the continued monitoring of the landfill sludge dump sites, so that if we decide now to landfill our sludge, whether it be wet, dry, composted or whatever, the Commissioner's responsibility shall be to monitor these sites so that they are properly run. I think that is what DEP is all about. This is so we don't get into the problem of contamination of water at a different level.

It also asks that alternate methods for sludge disposal - and it mentions pyrolysis and other things - should be considered. It asks for periodic evaluation and analysis of the economies of the regional treatment center in approaching this sludge disposal. It says that within six months

of the effective date of this legislation the Commissioner shall complete each step herein required. The bill on the face calls for sludge dumping cessation within one year. There is a provision of relief in the bill where the Commissioner is vested with the authority to grant temporary relief from this provision if a person can demonstrate a severe financial hardship or who cannot be accommodated in their sludge disposal requirements at an existing facility.

However, and I pointed this out to someone earlier today, in no case shall at any time the extension of temporary relief from the provision of this act be granted for a period longer than one year. So on the outside, we have a two-year bill here. It will get some people immediately off the ocean dumping in one year, and in two years we ought to end it all. I think there will be some vigorous activity around the State by the Department that should be charged with the protection of the environment to find these land sites that we need.

And, also, the last section of the bill calls for pre-treatment standards to be initiated by the Department of Environmental Protection. Lots of our problems--- I have to tell you a story to make this point clearer to you. When we had the hearing originally, I think it was in November or December, we had the agencies come in, and there was a fellow from the New York DPA there. He was quite knowledgeable, I guess. I said to him, "What are the sources of the heavy metal pollutants in the water." And, as you know, they have a common sewerage system. They have the water runoff and the sewerage system that are both the same. That is probably our biggest problem. And he said, "Well, you know, spoons fall down in the drain, or if you have old buildings like we have in New York where the drains are wearing out, that is the cause of the heavy metal pollutants."

Well, I almost fell under the table, Senator, because that is not the cause of the heavy metal pollutants. The cause of the heavy metal pollutants is the result of industry dumping into sewers, the photographic laboratories, the chemical outfits, the drug houses, and such. And I suggest that the sewage that is generated from the household people is not contaminated with heavy metals. So this bill calls for the Commissioner to set standards, and what we need is the policing of industries, so that they may not dump in sewer lines. We find people who are chemical waste disposers that take a waste from an honest company that charges a waste hauler with the responsibility of removing this from their plant, and they charge them plenty of money to do it, and they go down there the next time and dump it in the sewer, and that is where we have not addressed the problem. The policing is so lax; that is why we have the problem.

SENATOR RUSSO: Assemblyman Villane, you have proposed a solution to the problem that seems, on its face, to make a lot of sense. It is almost too easy a solution to the problem, which doesn't mean it isn't a valid one, but let me be for a moment the devil's advocate and anticipate some of the problems that ought to be raised in opposition to it. You have put a one year time limitation on the dumping and so on. You say that there may be an extension in cases of severe financial hardship. "Severe" is, of course, a word that we can't really define. Is it practical to cease sludge dumping in the ocean - therefore require it on land - within a cost that can be borne within one year's time?

The reason I raised that question is because I think just recently the date was moved up. In response to your suggestion, the 1981 date was moved up. I think it was Congressman Forsythe from this District who opposed this. He said it is not practical; it can't be done. What is the answer to that? Is it as simple and as clear as it appears in your bill? It may well be, and it may be this is the answer we should have sought many years ago, and until your bill, no one has.

Have you anticipated the problems? Are they solvable? Can it be done? Can your bill really be carried out?

ASSEMBLYMAN VILLANE: I would like to say two things in response to that, Senator. One, simplicity is the mother of design, and my experience in the short time that I have been in the Legislature is that we take the most complicated routes sometimes to solve a problem. And I don't blame only the legislators, I blame probably some of the people that work for us. We find complicated ways to solve simple problems. When General Motors was mandated to put anti-pollution devices on their automobiles, we did not clear up pollution, because you had every automobile that was built before that, and also when we did that, we had a phase-in program. They couldn't build a catalytic converter, but they started. And today you can ride down the highways—and outside of probably the buses that we fund through the Transportation Committee—and find very few polluters. The air is cleaner today. This is a starting point. If this bill begins to work, and we dump not 5.7 million tons of sludge in 1977 or 1978, but half that, then we have approached the solution to the problem.

I don't ever expect, and I know you don't, sir, 100%, but we have to start somewhere. Right now we haven't got anything. We have a 1981 date that no one is approaching. They can give you all these complicated and extensive words, but I think half the staff of the State of New Jersey works on filing reports.

SENATOR RUSSO: The only thing is, my question still remains, can the municipalities comply? You see, it is easy enough to say, and I am sure you have thought it out, and that is what I am trying to draw out. You see, we can say, look, you can't dump in the ocean anymore. Well, that is fine, but you are going to have to seal up all the toilets in the college here, too. Because if we don't have an alternative, we still have a problem.

ASSEMBLYMAN VILLANE: We don't have to do that. Here is what we have to do: We have to create in the sewerage plants that now exist the drying capability. When we dry sludge, instead of a big bathtub full or a barge full of viscous liquid that represents three or four percent solid and ninety-seven percent water, which is a most uneconomical way to transport anything--- Can you imagine taking ninety-seven percent water and barging it out to a site, and paying for transportation costs by weight or volume?

We are saying, then, reduce the liquid portion and precipitate it into a solid. Maybe we will have to do this with sewage plants; maybe we will have to put some of the

money into that, and then dry it. Incidentally, when it is dried, Senator, it only represents about 20% to 25% solid, and it still has a lot of liquid in it, but at least it is in a solid form. That can be -if it doesn't contain the heavy metals- dried and shredded and composted and landfilled acceptably for many of our landfill sites today. And that is why my bill calls for it. The Commissioner defined these sites, and there are some already in the State of New Jersey that are willing to take it, but the reason why they don't get the business, Senator, is because it is cheaper for a sewer authority to haul liquid waste out into the ocean and pollute the ocean.

SENATOR RUSSO: Let me ask you this: There are a few people in the audience today who are very much involved with the pinelands' water supply problem. My question to you is, would you feel that this landfill disposal is safe enough that we could do it in the pinelands without contaminating that valuable underground water supply?

ASSEMBLYMAN VILLANE: It is interesting that you mention that---

SENATOR PARKER: Well, I think it ought to be within existing landfill sites, and I don't think you ought to refer to the pinelands. I don't know what relevance that has.

ASSEMBLYMAN VILLANE: I think I know what the Senator means.

SENATOR RUSSO: Wait a minute. Let me explain to you what the relevancy is, Barry. What I am trying to establish here is whether or not removing the sludge from ocean dumping and dumping it on dry land has any danger of contamination of the underground aquifers. Now, I used the pinelands as an illustration only because it is so cogent today in the news. What I want to know is, does the proposal that Assemblyman Villane makes pose any danger to underground water. Now, if it upsets you for me to use the pinelands illustration, I remove that. Use any land illustration. Is there any danger to---

ASSEMBLYMAN VILLANE: I didn't want to really get into an Ocean County-Burlington County argument.

SENATOR RUSSO: It doesn't matter. Pinelands was used only because we all understand that there is a valuable water resource under there, and my question is, would this contaminate any underground water resource?

ASSEMBLYMAN VILLANE: We have the capability today, but I don't know whether we have the dollars. We have the capability to render sludge waste neutral. We can also recycle it, use it for heat. It is a matter of commitment. We have taken the course of least resistance. We have the capability today. I have a stack this high of people who testified at my hearing. We have that capability. You have the capability and technology today to make this kind of stuff a landfill for the pine barrens and not a contaminant.

While we are on that subject, and it is a little remote from my particular district, it is interesting to note that the DEP of the State of New Jersey has promulgated laws for the pine barrens that are unliveable, and they have not addressed the problem that is so prevalent in the Atlantic Ocean. Sure, in June and July last year I continually heard

reports - and the funny thing about that Department is that the good reports come from one guy and the bad reports always come from a staff member - that the water isn't as bad as you think; that the fish kill isn't as bad as you think. And then what came after Labor Day reminded me of the movie of Jaws. After Labor Day the Department said, you know, this was a pretty bad problem. We have killed the fish. We have destroyed the ocean bottom. The lobsters won't be here for twenty years. I can't understand the overkill in one area, and now they don't know how much water is in Ocean County at the pine barrens.

SENATOR RUSSO: In defense of the Department, Assemblyman Villane and Senator Parker, the Department has never to this date, and Dr. Paulson is here, attributed the problem we had in this ocean last summer in its entirety or substantially to sludge dumping. You had an unusual combination of weather phenomena - and he will talk about it, I am sure, when he testifies. It is all contained in detailed reports given to this Committee at our request.

Although the Department can defend itself, I think---

SENATOR PARKER: Yes, I think they ought to.

SENATOR RUSSO: Excuse me, Senator Parker.

SENATOR PARKER: I think they ought to, and I don't think we ought to editorialize any more. Let's hear from them.

SENATOR RUSSO: Until you are chairing this Committee--- The Committee will be chaired by its chairman. Whether you think we ought to editorialize or not is of no concern to me. You will be given equal opportunity to counter-editorialize. Just bide your time.

SENATOR PARKER: I don't think we should. We are here to hear what other people have to say, and that is the purpose of the hearing.

SENATOR RUSSO: You have offered that comment twice. I don't know that we need it a third time. There is going to be one chairman at these hearings and it isn't going to be the Senator from Burlington County until somebody names you chairman of the Committee. Until that time, let me proceed.

ASSEMBLYMAN VILLANE: Senator, if I may continue, I really don't want to get controversial. My criticism - I would criticize myself as soon as I would criticize an agency, and I have really no particular--- Honestly, my concerns are about the environment. I am no super, way-out environmentalist, but my concerns are that some of our agencies, not only in the State of New Jersey, but some of the bi-state commissions and the federal EPA, have changed their mind on us. One time we said, don't move from the twelve-mile site because you will only pollute another portion, and the same agency, sir, six months later will come out and say, move to the twelve-mile site. When they said not to move, it was because they said we don't have the ocean going tugs; the costs will triple; there is no way to police it, and now we have changed our position.

During the summer crisis, if you remember, Senator Russo, we did say some things like the thermocline was not a result of the nutrients from the sewage, and then we said later on that perhaps it was a small percentage. I don't really mean to be critical, but

what I hope for is constructive criticism and a constructive approach to the problem. You know, all of us arguing among ourselves, we are all in the same blue, like we said when I was in the Air Force. We all want the same thing. We really do want the same thing. I think this is the greatest way to do it, to discuss the four bills involved in both houses, and for you people to join this bi-state commission of mine. I am happy to have you. My true concern is that we don't let this thing go any longer than we have to.

SENATOR RUSSO: Tony, let's go back. Do you think it is feasible to do within the period of time that you suggest? Putting the ocean aside for the moment, is it a practical alternative to take this sludge, based upon the technological knowledge we have now, and put it on dry land, disposal sites, without contaminating underground water supplies? I think you mentioned earlier that it is possible to do it, but it is just a question of money. Can we as a practical matter within one year and three months do that?

ASSEMBLYMAN VILLANE: I would like to get to that. Except for areas that are heavy contaminants of the heavy metals, where you have that - incidentally, we dump chemicals in the Bight area that are 100 times over the EPA standards, for instance cadmium - from Cape May probably to Monmouth County, there is not one place where we take sludge out that I don't believe contains heavy contaminants. That immediately can be done, if you had a regional place to start with only. If you said this was an emergency procedure - and maybe it is - and if we brought a turn-key package into place and said, all right, we are going to spend one million or three million or whatever it took to handle the sludge from those areas, and then if the Department of Environmental Protection went to the areas that they know contain heavy contaminants and said, there is a polluter in your area that is dumping heavy metals in here, and let's get on their case, that would be a step in the right direction.

There is another argument we have heard from industry and we have heard it from my end of the house, that is, we are going to drive business out of the State of New Jersey. That should be addressed. The cost of the product manufactured by these companies that cause pollutants, the cost of that product should include the cost of keeping their waste clean. That doesn't sound like a Republican attitude, but I can tell you that unemployment will be the cry that you will hear from the industries that are attempting to move out. But they must include in their product cost the cost of cleaning up their water wastes.

And so I say we have the capability, whether we do it in twenty-two regional sites like we have in the solid waste program or in three major regional sites. That is of no consequence, but we should have them spread out so we don't have transportation costs. Senator, this bill will work. We have to have the guts to stand up behind the bill and tell them to get going on it. Let's start on the project. I wouldn't mind if it was amended. I wouldn't mind if they had a new bill next year, but I would like to see us get started in that direction.

SENATOR RUSSO: Assemblyman Kozloski has a few questions.

ASSEMBLYMAN KOZLOSKI: I would like to make a couple of comments. Number one, as co-sponsor of the bill, I am glad to see there are many Senate concerns as well in this matter. There are a couple things I am very concerned about. One is, as with any other bill that comes through our Committee, and the staff of the Committee who are here already know this, we will be promulgating rules and regulations. I would like to see an amendment made here to have an oversight committee, so that before the Commissioner can just go out and promulgate rules and regulations - which again has the effect of law, you might say - the Committee can sit down and review the rules and regulations of major legislation like this.

That is my basic comment. I would like to see the amendment include that.

SENATOR RUSSO: Would you perhaps take that up with the Assembly Energy Committee.

ASSEMBLYMAN VILLANE: The first co-sponsors of my bill, Senator, are the four members of the bi-state commission, and that is Assemblymen Barry, Kozloski and Van Wagner, and I am sure we can work out that recommendation.

SENATOR PARKER: There are a lot of bills already that have been introduced that do just that. They are not only oversight, but they require notice provisions before the administrative rules go into effect. They give the legislature a veto power within 90 days. As you know now, there is absolutely no limitation on any rule making power of any agency under the Administrative Procedures Act. I think there is one in your house that has every Assemblyman almost on the bill.

ASSEMBLYMAN VILLANE: You are so right on that.

SENATOR PARKER: Whether we can move those or not is another matter.

ASSEMBLYMAN VILLANE: I served on the Commerce, Industry and Professions Committee, and we deal lots of times with the Consumer Affairs Department, and I can't recognize the regulations for the bill we passed. That is one of the problems. I think Senator Parker has a good idea.

SENATOR RUSSO: I think I have a bill pending that is waiting for floor vote now that would provide that no legislation becomes effective until after the rules and regulations have been adopted and reviewed by the Legislature, and that is basically the same thing. I hope we can pass it.

ASSEMBLYMAN VILLANE: I think we are getting smarter as we go along.

SENATOR RUSSO: Is there anything further? Senator Mc Gahn.

SENATOR MC GAHN: Yes, Assemblyman Villane, you are talking about one method of disposal, sludge disposal, which is five percent of the problem. We are not addressing ourselves to the other areas. We are more concerned with what constitutes forty percent of the problem. As we are attempting to upgrade waste fluid treatment methods in the State, that percentage will decrease. We can then come over and address ourselves to the dredge spoils, which is thirty percent of the problem, and which the Army Corps of Engineers simply dredges about 11 million tons in the New York Harbor. As such, it has no provisions for onsite confinement in those areas.

We are not addressing ourselves as yet to the strong water runoff which constitutes some twenty percent. However, there are two bills that have passed both houses, S-1224 and S-1223, and they are awaiting our signatures. They will provide for the DEP to regulate and control strong water runoff and the increased water quality. This hopefully would decrease possibly the pollutants by at least ten percent hopefully, so we are saving ten percent, basically, there.

My question, of course, is this: You are talking about landfill disposal. There is only one mechanism or alternative technique. Some of the proposals are valid and I think we should take a stand as far as coming up with alternate methods of disposal, even to the point of utilizing sludge along with solid waste in co-generation of power units simply to run that particular plant, which is fine.

We are talking about an initial capital investment, and we have to proceed - and I doubt very much whether that would be within the one or two year period of time realistically. I think you realize in the time that you have been in the Assembly that it is like pulling teeth to get the legislature to pass any major piece of legislation - look at the income tax and look at every other bill.

I think, however, the proposal that you put forward is extremely valid, but the landfill proposal itself, just utilizing existing landfill sites, - We are faced with a solid waste disposal crisis in the state as of 1990. Landfill disposal sites very frankly are going down the drain. The only ones really working at the present time are in South Jersey. This is one of the reasons why the 620 was passed. So the point here is, if we are focusing our attention, we do have to probably do this in conjunction with private industry, despite the fact that most of the areas that we are talking about here are public facilities, municipalities, counties. We have to use some regional approach. There has to be an approach to get rid of, if you will, the sewage disposal. I think this is even much more important, because what we are talking about is five percent today, and in five years it may actually be ten or fifteen percent.

As we decrease the amount of pollution from waste water fluid, as we will upgrade and advance water treatment and quality, then we are increasing the amount of sludge. And I certainly agree also that the concept must be given here for something other than the aesthetic value or odor of some of these. I think some of this basically could be used as fertilizer in certain areas, but again I get back to your point, and I have to agree wholeheartedly. I think that efforts must be made also in other areas to basically reduce the amount of pollutants.

Already at this moment on the Governor's desk there is a bill that would significantly reduce that figure by ten percent right now.

ASSEMBLYMAN VILLANE: Right, I voted for those two bills and I think you are right. We are taking a step at a time. We have taken a step in that direction and we are going to take a step in the sludge direction, and I think the next step that we have to take is on the federal level, controlling the dredge spoils operators. Of course, here within our own

State, I think we can control the heavy metal contaminants. It will take a while. We won't do it in a year, but we will be working in that direction. I think we are getting to it. People say that they become disgusted with the lack of activity, and I say that we are further today than we have been in a long time. We are closing in on the problem. We have identified it. We have heard all the testimony about all the things that are happening in the ocean, but we are now getting down to the nitty-gritty, as I said earlier. We are getting to the point where the heat is on, and I think that we can solve this problem, whether it be three percent this year or six percent, and if we can go to dredge spoils in a year or two, if we have to go to Washington, if we have to get our Congressmen and our Senators, I think we can do it, and we owe it to the people.

SENATOR MC GAHN: I think the bi-state commission that you head is an excellent example, and it certainly shows cooperation between the two states, and very frankly there is a possibility that they will come up with what is needed.

ASSEMBLYMAN VILLANE: Senator, just one closing statement. The final thrust of this particular piece of legislation, 2320, along with the Senate Committee - and of course, Assemblyman Barry, who is on my committee, and myself have talked this over - is that we are going to attempt to have New York institute the same piece of legislation in the New York Legislature. They are of the opinion that we can't get this bill out of committee, and I hope they are wrong. But if you people will be kind enough to consider my bill for release from Committee, I can take this bill to New York - and it has been my intention right along - and ask one of the Assemblymen there, whom I have been in touch with, to sponsor this bill in the New York Legislature. The particular Assemblyman I have in mind has been an Assemblyman for 32 years in the New York Assembly, and he is as concerned about the environment as we are.

I would like to see this bill written to effect New York. Can you imagine what kind of progress that would be? It would be far harder in the State of New York to comply with this. They have serious, big, big problems, but if they could address the problem as we have addressed it in the State of New Jersey, we would be well along the way. They have problems that are going to take ten years to solve, but if we can get something together to work on with them, that is the important part. We have to get this into a regional approach. I think that we are getting there. Thank you, Senator, for your time this morning, and I appreciate your tolerance.

SENATOR RUSSO: Thank you very much, Assemblyman Villane. I think the Committee joins with me in commending you for your efforts in this particular field of ocean pollution. You are quite involved in it, and we appreciate your help here today, and we will do what we can. Thank you.

The next scheduled speaker is Senator Parker, with regard to bills 1659 and 1808, sponsored by Senator Parker and others. Barry.

B A R R Y P A R K E R: I will just comment from here, and I will be very short. The one bill does exactly what Dr. Villane's bill does, put an immediate stop on ocean dumping. I will comment just briefly. I think it is essential that we pass legislation to prohibit dumping, at least from our state, as a token effect. It may not be the sole answer, as has been indicated, but I think we have to take the step.

In reference to composting, landfills, pyrolysis, certainly the capability is here. If we don't put a deadline on them, which is immediate, none of the state agencies or any of the federal agencies take any initiative to move in that direction. I call to your attention the fact that four years ago I requested the PUC to fund and start a pyrolysis program and composting program for all types of solid waste, and today at this point nothing has been done.

Dr. Villane indicated that the problem was one of agency, and I am not blaming either the agencies in Washington or here particularly. I just think it is a general inertia that pervades most of our administrative agencies that nothing has been done. And until we put an immediate deadline on them, nothing is going to be done, so I think we have to move immediately.

In reference to the bill, I recognize the financial difficulty and capability that many of our municipalities may have in funding this type of program. That is why I put in, back in December, a bill which would provide a \$100 million bond issue to provide for alternate means of disposing of all types of solid waste, which includes not only garbage, landfill, sewage sludge, but I think we have to tackle all of the problem in reference to solid waste, and this would provide the funding for it.

It seems to me that we have had enough testimony; that we know exactly what caused the black cloud or black ocean last year. Those of you who live there and went through it know what it was. Certainly we have problems with landfill sites with the leaching, and problems with metals on the sludge, and solid waste refuse, but we can isolate these, require pre-treatment before it goes to sewage plants and provide for sales tax rebates on this type of program.

But unless we do something - and it is rapidly coming to the summer again when we are going to be faced with the same situation - there will be 21,000 square miles of dead ocean, the clam industry dead, the lobster industry dead, and the lack of oxygen driving all of our fish in shore where they are over-fished and possibly depleted. I don't know whether all the flounder are depleted or not. Only time will tell. Stripers have moved on, and the various fishing industries, after we have just passed the 200-mile limit, may well be dead because we haven't taken any move to protect our ocean.

Now, that is the end of my comment. There is a cost factor that is immediate and has to be addressed. There is a time factor forcing industry, local sewerage authorities and utilities authorities and our other state agencies, federal agencies and the like, to move. And unless we move immediately and do something, we are going to be severely criticized come this summer if the same situation occurs. Incidentally, if we don't pass the bond issue referendum bill now, it won't be on the ballot in time for this Fall, so that the

people can provide the funds, or assist in providing the funds that are necessary. So, even if we don't pass the sludge bill, if some of you feel that we don't have an immediate problem there, or if there are too many difficulties in getting it passed, we should immediately pass a bond issue and give the people the right to vote on whether they want to spend an additional \$100 million to set up pyrolysis, composting, and various types of drying facilities, so that we can use sludge and refuse for fertilizer.

So it is essential that we move this bill within the next month, because we have an election year and it will not have an opportunity to be passed if we don't do it before May 15th, when we adjourn.

SENATOR MC GAHN: Does anyone on the panel wish to question Senator Parker? Senator Parker, I know it is election year, and I had forgotten until you reminded me. I have one criticism of this bill, and you are fully aware of this, and I wish you would address yourself to it, and that is, the marine industry, and the fishermen of the State have criticized this because it does nothing, as far as they are concerned, to simply help them out in their own particular situation. Would you kindly address yourself to that?

SENATOR PARKER: That is a different bill, Senator. That is a bill which sets up a fund from the benefit of the marine fuel gas. That is not being considered today. This bill has nothing to do with that. S-1808 provides for a bond issue to be put on the ballot this fall for the public to vote on spending additional funds for certain types of composting, certain types of pyrolysis units, drying units, all forms of alternate ways to dispose of solid waste, including sewage sludge.

The other bill which you are referring to is not on the schedule for today, I don't believe, but we have amended it. I am aware of the "boating interest" objection. We have amended it. When the bill was originally drafted, part of it was left out, and I think provisions for an amendment have been put in there to broaden the scope of it to include their objections. But, of course, some of that money in that bill would be used in an ongoing basis to help fund some of these programs on the state level.

SENATOR MC GAHN: If there are no further comments, our next witness is Assemblyman Van Wagner.

R I C H A R D V A N W A G N E R: Mr. Chairman, first let me apologize for not having a prepared statement. I will submit, in writing, my comments to the Committee. I don't think it is necessary, based on the controversy and dialogue that has been carried on throughout the past several years, to go back over much of what has happened, particularly as it relates to the question of ocean dumping in the area off our shore known as the New York Bight. It has been a problem that I know people have been working on for years before me, and people probably before that, from the time that ocean dumping was approved as a means of disposing of certain wastes. Those of us who live along the shore area, and others, I might

add, have become concerned about the continued impact of this dumping in that particular area. In recent years - and, again, if I am repetitious, it is just so that I might perhaps put my legislation in some perspective - we have experienced widespread fish kills, damage to our shores, losses of considerable amounts of money by our resort industry, and unfortunately, many of those agencies that are charged with the responsibility of seeing to it that this does not happen to our shore have engaged and are apologetic over what has caused the various negative impacts that have occurred off our shores, and it seems to me at least that at this point, some several years later, we are still talking about what is causing it, and we have not moved very far toward solving it.

Perhaps one of the most dramatic points that I might bring to your attention is that recently in one of the newspapers the GAO Office in Washington published a report wherein the Environmental Protection Agency, the Federal Environmental Protection Agency, readily admitted that it was permitting the dumping of toxic materials in the New York Bight, and in other ocean dumping areas. They readily admitted it, and readily admitted that many of these materials might be dangerous to marine life and subsequently dangerous to our shore regions, and offered as their own reason for continuing this the fact that they had no viable alternative. Perhaps that is partly our problem.

The bill that I am here to speak to you about is A-2357, and in my judgement I believe it presents to you for your consideration a viable alternative or at least an approach to developing a viable alternative. Merely the use of landfill as an alternative to ocean dumping, or landfill efforts as an alternative to ocean dumping is not going to strictly solve our problem. As many of you probably know, we have had to in recent years pass a solid waste management act because of the crisis that we faced in terms of our sanitary landfill. It was from this act, the Solid Waste Management Act, which I believe was passed by the Legislature and signed into law somewhere around 1975, if I am not mistaken, or 1974, that I attempted to develop an alternative plan to dispose of sludge waste. I might add that sludge is only part of the problem in terms of what is being dumped off our shores.

I mentioned to you earlier that EPA has admitted to the dumping of dangerous toxic substances. It is my opinion that this legislature, this Congressional Delegation, and anyone else who has any voice in the matter ought to hold EPA's feet to the fire on that one. I think they ought to answer to that. They have it within their powers to stop that or to refuse those permits, so perhaps that is one remedial solution. Secondly, we have to deal with the question of sludge. We have developed sewage treatment plants throughout the State, mostly because of Environmental Protection requirements, and in doing so, we created another monster for ourselves, sludge, and the question of how to dispose of it.

It is within the confines of A-2357 that I propose to you that we answer this question. The Solid Waste Management Act, as you know, divides the state into twenty-two Solid Waste Management Districts, which include the twenty-one counties and the Hackensack Meadowlands Commission. This bill would in effect bring the question of sludge disposal under that advisory council. I realize that there have been some questions raised from the Department of Environmental Protection. I believe Dr. Paulson has recommended, perhaps, an even more regional approach to the problem. I have no particular argument with that, if that can be effected, but I do think we have to set in motion in this state a plan, an alternative plan, to ocean dumping; otherwise, we are going to find ourselves in the same "Catch 22" situation with Federal authorities that we found ourselves in in the last couple of years. And that is,

when we go before them and we present our case, and we finally get them to admit that what is being done out there is indeed dangerous to our shore line, they throw up their hands and say, "What else can we do." And it is within our prerogative as a state, as it is within the prerogative of states all along the northeast region, to begin to develop those plans. There are federal monies available for the development of those plans, but we must show the federal government a plan, a plan that we can implement.

There are many other pieces of legislation before you. Certainly, the question of what to do now is paramount in your minds. I realize the setting up of the mechanism contained in a bill like A-2357 may take a period of time to affect after passage of the bill, and the question of what we do now has drawn some direct criticism from various sources. In my opinion, at this point at least, it would appear that there are two strategies that should be taken: One, as a remedial measure, removing the dump site to approximately 106 miles off shore for a specified short period of time. That may be one remedial measure, but I do not think that measure should be taken as the sole, solitary, measure. I think it has to be backed up with an alternative piece of legislation that would prescribe the method in which we will then move to an alternative to ocean dumping.

I personally have never been an advocate of moving the dump site. I realize that just constitutes moving the problem from one spot to another, but I recently received some correspondence from a gentleman who did some research independently for me at my request last year. The gentleman's name is Mr. Patrick Ganigan, and he indicated to me that in his research, as long as it was for a short period of time, there was perhaps less of a possibility of danger to the marine life at the 106 mile limit.

SENATOR PARKER: Excuse me, if you do that, aren't you going to run into the problem at that point that it will be easier for them to do that than anything else, and they will continue on, regardless of the ecological impact, and then you are going to have more difficulty moving them off that. If you stop it immediately and don't let them dump anywhere, won't that obviate the problem?

ASSEMBLYMAN VAN WAGNER: I agree with you, if we could force the Environmental Protection Agency to enforce its own laws- which, by the way, it is reluctant to do, because the office has an excuse that in the regular organization of things, between the various agencies that become involved in what happens to the ocean, that their function can sometimes become submerged. Unfortunately, and this is only my opinion and it is only a conclusion that I have reached at this point, we don't really have, per se, an environmental protection agency because they are not doing a hell of a lot of protecting at this point. Perhaps it is because of the statutes that control their operation. I think that has to be looked into. Certainly, there seems to have been at this point a rather disorganized approach.

My fear is that we can go before them and say, I think we have a solid case, Senator, for saying, stop dumping certain kinds of materials. I think when we get into the question of sludge, and probably dredge spoils too, when you say stop dumping, they are going to say, show us how to dispose and give us an alternative. I think that is where we are running into a problem. I think right now we have the power, and either this Committee or the bi-state Committee which I serve on can say immediately to the EPA, "you have in fact admitted dumping of hazardous materials; stop that right now, and find another way of disposing of that. "

My motivation in presenting A-2357 is to provide us with a plan, and it seems to me that the most logical approach to that would be to use the present solid waste advisory act and bring sludge disposal into conformity with that act. I know I mentioned moving of the dump site as a remedial measure. That would be last in my final analysis, in terms of what should be done. I agree with you. I fear the move of it, because it seems to give them another intermediary reason for continuing. As I said, I would only recommend it in relationship to other legislation being passed.

SENATOR PARKER: Does your bill provide for any ban at all on sludge dumping or off shore dumping of deleterious substances?

ASSEMBLYMAN VAN WAGNER: I don't think there is language in the bill that specifically says to stop dumping. I think there are other bills that say that. As I mentioned earlier, this bill is not in any way in conflict with any of the other legislation. It is different from the other legislation. I think in that one area, perhaps, it does not say, stop dumping now. The reason I did not put that in is because there were bills that were saying that, and it seemed to me to be a waste of time and money to put another bill in saying stop dumping. That has been said a number of times in other pieces of legislation.

So, any of the legislation that is before you now can easily be companion to the A-2357. For example, Senator Russo's bill, which I believe levies a tax, along with A-2357 may solve another problem we have. I don't know enough about it, but I understand the controversy that is holding up the implementation of the Solid Waste Advisory Act is the question of tipping fees at this point. At least that is what I have read in the newspapers.

Perhaps Senator Russo's bill tied to 2357 creating the actual plan for sludge disposal might eliminate some of that controversy; I don't know. But certainly it is incumbent upon us that without some kind of plan --- Of course, other legislators, feeling as I do, have submitted legislation which says stop dumping or this is how we might implement a plan by the use of the sludge tax. You know, as I say, none of these other peices of legislation do any violence to A-2357. It is a separate, independent, legislative process.

ASSEMBLYMAN BASSANO: Can I say something? The problem of sludge is a problem that we naturally have all over the State of New Jersey. Most of the dumping that is taking place obviously is coming from New York, number one. I don't think we have that much jurisdiction over that 200-mile limit to stop New York City at this point.

Item number two, if we stop the dumping-which I happen to be in favor of stopping, because I happen to be a fisherman, and I enjoy the coast as most of us do- we are going to have to go to landfills. Once you get above the Raritan, that is where the problem comes in, because landfill is just not available. Just as an example, my town of Union, where I reside, is made up of 53,000 residents. We are presently dumping in the Hackensack Meadows. Now, once the Hackensack Meadows Commission takes over, they are talking about charging our community anywhere from \$550 to \$2300 per ton for solid waste without even taking into consideration sludge. This is a real, real serious problem.

Number three, I think we are going to have to look at the act that you are speaking of, the P. L. 1975-326, which really did nothing more than take the problem of solid waste and hand the problem right back to the counties. That in fact is what this particular bill did. Unfortunately, the State sort of washed their hands and walked away from it. Now, some of the counties like Middlesex County have been acting in this area to try to solve their solid waste problems.

Unfortunately, my home county, because of political differences, they are sitting on their hands, and now to pass your legislation and also throw sludge underneath their laps, I just don't see anything happening with this point.

ASSEMBLYMAN VAN WAGNER: Can I comment on that?

ASSEMBLYMAN BASSANO: Yes, of course.

ASSEMBLYMAN VAN WAGNER: First of all, the Solid Waste Management Act really came more as the result of probably a court case, and I shouldn't say as a direct result, but it was certainly influential in the final decision. I believe the court case involved Ocean County, right here. The court in that case said, concerning the issue of solid waste management, that it was an issue for the legislature to decide, and in their opinion I believe - and I am not an attorney - the language was fairly clear in that they implied at least or recommended that the State perhaps handle that on a regional basis.

The Solid Waste Management Act was then developed, because counties are the regional forms of government that we have in this state, along with the Hackensack Meadowlands Commission. I realize that many communities in many counties have differed on its implementation, but I believe Middlesex, Monmouth and Ocean Counties, and perhaps some others that I don't know about, have moved pretty fast in this area. I might add, too, Assemblyman Bassano, that the bill A-2357, and I believe the Solid Waste Management Act does also, provides that other methods of processing materials be utilized whenever possible. For example, A-2357 requires land disposal or processing of sludge as soon as the solid waste plan for the district is adopted.

So, in other words, the solid waste district - and I realize that many of them are facing problems which you mentioned - would have the opportunity first to develop its solid waste plan, and then the next responsibility would be the development of a sludge disposal plan. I frankly think that we here in New Jersey have the opportunity to turn a bad situation into an excellent economic opportunity. We have talked for years about the environmental controls that we have been placing on our land and our water and our air, and so on, as eventually producing jobs, other kinds of jobs. We have them at our disposal here and now, I think, and particularly in this area.

If you incinerate certain forms of sludge - and again I am not a scientist - I believe some of the burn off gives you a product called methane, and certainly in our society at this point, and particularly in the northeast region, I don't think we are in the position to pass up opportunities to seize other alternate energy sources, particularly when you consider the cost of energy today.

So I realize there are problems. I think whenever you set up any kind of overall legislation on a regional basis, or a countywide basis, where you are requiring another level of government to perform a certain act, that you do place a burden on them. My feeling was on the Solid Waste Management Act, and is as it relates to sludge, that we would have to offer some kind of incentives to counties that engage in these kinds of activities. I think the federal government ought to get more involved. They provide plenty of of planning money. The problem with the federal government is that sometimes they just don't provide enough implementation money. That is what seems to go begging many times. I think if they could develop at least a five or seven year funding cycle for projects such as these, that we would find a lot more counties entering into these kinds of activities.

I think there is at our disposal right now, if we are willing to plan for it, and we are willing to develop it, perhaps one of the greatest economic ventures that this State has entered into in some time, and it concerns energy and the environment.

We can do that, and at the same time we can protect our ocean front. That is the important bottom line that we have to think about. I don't think we will ever get that area back to where it was when I first came down here in 1948 to live - and others who came down before me. I don't think it will ever go back to what it was. Just as we lost Raritan Bay, we are going to lose our ocean front. But we have to move hard and fast on it, and we have to hold the federal government's feet to the fire on the issue, because they have not come up and given us the kind of support in this area that we need. They just simply have not done that. They have spread money out for planning purposes. They have talked about the concepts that are involved. Private enterprise has become increasingly more interested in this area.

There is not a damn thing wrong with private enterprise. At this point it is not a bad idea for New Jersey, perhaps to start to inject some life into the private sector and get it moving. Here again is another area we can move into. In other words, I think we could provide not only a plan but assistance to counties like Union and other places where there are problems in developing this, and really move forward on it. I feel very positively about it. I think it is time for us to stop with the redundancies.

Just to give you an example of my experience, it is rather frustrating, over the last three years I have been to numerous public hearings, and I have heard the interstate commission testify, and they have moved along with their plan. You can see their progress in their reports from year to year on what they have been doing. Again, we have to have that federal agency, which is finally going to make that kind of a commitment to all the mechanisms that have been involved in trying to solve this problem. And it becomes very frustrating, because every year we go back to these meetings, and we go back to these hearings, and we hear people repeating the same kinds of things, and we get the same kind of apologies from the EPA. We don't have enough Coast Guard to patrol the dumpings. You know, we might as well go out and get our own Navy at this point, because it is going to become cheaper for us, because what is being destroyed out there is going to cost billions. We have a multi-million dollar industry in this State, between sport fishing, commercial fishing, the fishing tackle and all the items that are sold. I think one of the papers did a survey on it. It is a multi-million dollar industry now, and it is probably going to be a billion dollar industry, and we are going to destroy it if we continue to let what is happening happen, and we have to become aggressive and positive in how we are going to develop a plan. I think this bill begins this process.

I don't say this bill is perfect, but I think it is a beginning.

ASSEMBLYMAN BASSANO: The point I am trying to make is that right now with 326 the counties are not moving. Again, are we going to ask them to take on the liquid waste problem now? I think unless we get more forceful with the counties and force them to take on this problem and give them a deadline as to when they have to solve it, nothing is going to happen. That is the point I am trying to make.

Now, last year I took the opportunity to fly down to Baltimore to review a recycling operation down there on solid waste, and it is a complete recycling operation where they actually form markets for material to compete with the private enterprise with raw material, and it has worked out very well. I am sure they are working on the liquid waste problem, too. But unless we back the counties

right against the wall and say to them,"Hey, you have a deadline to meet; this is the problem, now meet the deadline and solve the problem." I think until we do that, whether it be with this legislation or anything else, nothing is going to come out of those counties.

ASSEMBLYMAN VAN WAGNER: But, see, I think we have the opportunity to do something else for them, and backing people into a wall sometimes doesn't get you what you are looking for. And I agree with you. I am not disagreeing with you, but I am saying, what we have to do is not just say, all right, this is it, now do it; what I am saying to you is that we have to get an amalgam of thought, if you will. Perhaps we have to say to them, look, we will put people in front of state or the federal government, perhaps, to come and say, look, we will put people in at no cost to you to develop your plan, to develop proposals to get you planning money to help you move along not only with solid waste, but with the sludge disposal.

In other words, I think it is more than just holding their feet to the fire, which I think you have to do, certainly, but I think we have to say to them that we do have the resources available to help you, and that is what we want to do, we want to help you solve this problem, because it doesn't belong just to the people on the Jersey shore. It is a problem that belongs to all of us. You mentioned that you go fishing. You know, hundreds of thousands of millions of people enjoy the shore area, particularly down near Sandy Hook where you have a federal park that is free. You can't get into that park after eleven o'clock during the summer.

I think that we have to say yes to the counties so that they will move and implement, but I think at the same time we have to say, look, while you are doing that, we are willing to help you in any way we can, financially, planning, or with the development of proposals to get monies from the federal government. That, I think, is going to go down a little easier than if we just say you have until May 21st, and if you don't do it, we are going to start whatever we are going to do.

ASSEMBLYMAN BASSANO: Well, one of the other problems that all counties will be faced with if we pass legislation of this type - I know some of the counties want to get into pyrolysis, and chemical installation is just not perfected at this point. Nothing is done. They are moving along. I don't know of any project running completely by pyrolysis. I may be wrong.

SENATOR PARKER: Well, I think the experts are here. I think there are several of them here, one in St. Louis, and Philadelphia has one moving.

ASSEMBLYMAN VAN WAGNER: I have tons of information.

SENATOR PARKER: From what I understand it is perfected.

ASSEMBLYMAN BASSANO: But whether it is perfected completely or not - I guess that could be debated - I think we are going to have to also supply the counties with money. This is another problem that we have with 326, which I am sure you are aware of. But I am just asking ---

ASSEMBLYMAN VAN WAGNER: Senator Russo's bill may solve that problem for you; I don't know. I think that is part of the controversy that exists now over the question of tipping fees or whatever, and I think that has to be resolved certainly, and I know that is a problem. But I don't think it should stop us from moving ahead.

ASSEMBLYMAN BARRY: I have just one question. During your explanation of A-2357, you mentioned the availability of federal funds and you were talking about

the economics involved. Certainly as we listen to many hours of testimony in the legislative committee, the question of economics always comes up. Could you tell us a little bit about what funds may be available?

ASSEMBLYMAN VAN WAGNER: Yes. There have been at some time. I think you were at the meeting, Jim, and I don't remember the number, 208, 211, or 715, whatever. I think there is federal planning money in the area of--- I think it is section 208, non-point source planning, which can be used in the case of a non-point source. Point source would be the dumping of the World Trade Center directly into a river. I have learned some things in the last three years. Point sources are the direct source of the pollution impacting. This would be a non-point source case under federal 208 planning monies. There are non-point source monies available. That is why you might want to go to a bigger regional model, rather than to solid waste. It doesn't have to be similar to a solid waste management act in that area. You might just say instead of one county per sludge site, four counties or five counties. You know, you might want to include a regional area like that to more effectively utilize the planning monies you have available, but there are monies available in the section 208.

I believe under the act that funds municipalities and states for sewerage plants, there is also an allocation of 8%, 12%, some percentage of monies from the total allocation that is set aside for the development of sludge alternatives. Middletown Township Sewerage Authority, for example, just got appointed by the Federal Government to develop a sludge alternative. They are working on that down at their Sewerage Authority.

In other words, what I am saying is, you can create an umbrella bill, and under that bill provide the assistance to sewerage authorities and landfill operations at practically any level. You don't necessarily have to have a certain area that is not producing a great amount of sludge, let's say, a large scale operation. I think you will probably get testimony today that some of these units are modules. You can buy them in four module parts or you can buy a quarter of one or a half of one. I am not in the business, so I don't know, but as Senator Parker mentioned, I have piles of information from companies that have gone pretty far forward. Those are the two prime areas of federal funding that I know about, and I would think certainly the Congressional people in the shore area, Congressmen Howard and Hughes, and people like that, who are very, very close to this situation, are probably working on and attempting to develop additional funding, specialized, characterized funding for this particular problem. I would hope they are and assume they are.

SENATOR RUSSO: Are there any other questions from the Committee?

SENATOR MC GAHN: Rich, after all this time, this is a very difficult question to ask you. Is this bill necessary? I say that because as I read this bill, S - 624, frankly, the DEP could do everything in their that you have in that bill.

ASSEMBLYMAN VAN WAGNER: Well, I am not so sure they can, number one. I am not so sure DEP can do everything without this bill. When you say, is this bill necessary, I would have to say yes in the same manner that the Solid Waste Management Act was necessary, because I believe in that regard, had we wanted to, we could have said to DEP, do it. I think the presence of the legislation is necessary, because, number one, regulations change, personnel change, attitudes change. I am not saying that anyone in our Department of Environmental Protection - and I have talked to them about the problem - would ever change their thrust, which is to get the thing done and get it going and stop what is going on out there.

Down the road, I think you have to consider what might happen, and I think the presence of legislation providing for the methodology should be in place.

SENATOR MC GAHN: The point I am getting at, S-624, which is the Solid Waste Management Act, does get very specific, as you have enunciated the bill here, as far as mandatory sludge, the facilities, the way it is going to be treated, et cetera, is all included in the bill.

The various twenty-two districts, of course, shall be required to come up with a solid waste management plan which must be reviewed by the DEP before a statewide management plan, of course, can be put into effect. Of course, there are provisions here for regions other than the Hackensack Meadowlands. Certainly in South Jersey, Atlantic County can go along with Cape May County, and Ocean County as a region. I agree with you, I think you are spelling it out a little bit more specifically, but the point I am getting at, I think these powers already exist in DEP under the Solid Waste Act that was passed last year. That is comment number one.

Comment number two, of course, I agree. I struggle with S-624 for a few years, and we were attempting to come up with funding as far as the counties are concerned. Initially, that bill was \$2,100,000 almost \$100,000 for each of the counties. So we finally passed the bill for authorization of \$400,000. This, of course, did not go through. The Commissioner decided a fee schedule in order to implement this. At the present time fees are being collected and being held in escrow because this is pending a court decision. The legislation last year failed to fund anything to implement the Solid Waste Act. Hopefully this year they will fund it.

But we are really talking about the fact that you can not get cooperation from the counties. It is a very difficult thing to get the counties to cooperate, particularly with a cap placed upon their spending. We are not providing the funds, and we are not providing a carrot to permit them to come up basically with what is necessary. A lot of counties have pre-empted even this act, because they have developed, prior to this time, their own solid waste disposal plan.

Again, getting back to the base line, I think the commitment for funding must be made by the legislature if we expect counties and municipalities to cooperate. I have heard everybody talk today, and this I think is perfectly fine, but I think the legislature then has to, on a one to one priority basis make a determination as to how much money is needed to effectuate this. The bottom line is we are talking about money. How much money are we willing to spend? How much money are we willing to vote for? The unfortunate part of it is - and I think that John Russo has said this, and Bill Musto has said this - in order to get anything through, it takes 21 votes in the Senate and 41 votes in the Assembly, and while I and John and Barry and yourself are here representing ocean counties, we do not always get the support of the other legislators throughout the State as far as those things which are vitally essential not only for the State, but primarily important for the counties bordering the ocean.

My original question is, do you honestly think there is any danger that DEP at the present time does not have the power that is in S-624?

ASSEMBLYMAN VAN WAGNER: May I respond to that point by point? And, John, I would like to ask you, if I get 41 votes in the Assembly, would you get 21 in the Senate? (Laughter)

Let me address myself to point one, you are correct, and I shouldn't say that, it is correct, that the process for developing all sorts of methodology and procedures is contained in the Solid Waste Management Act. However, and I point this out, this is an important exclusion, the question of sludge is excluded. Sewerage treatment facilities are excluded from the Solid Waste Management Act, all right, so this bill, although it is modeled upon the Solid Waste Management Act, addresses itself not so much to the processes developed under that bill, but to an area that is specifically excluded from that law now, and that is the sludge itself and the sewerage treatment facilities themselves, because they are the ones that will become involved in it. They are the ones that produce the sludge.

Secondly, I agree with you, and I thought I had made that point when Lou and I were exchanging thoughts on the problem in Union County, for example, and other counties; I am sure that we are going to have to provide some kind of incentive. My feeling would be this, Senator, concerning the caps - and we are struggling down in the Joint Appropriations at this point with the cap ourselves. We have many items of priority that we would like to fund but can't because of the cap - I think what we have to do at this point is begin to use our imagination, and maybe that is one of the better things about the cap, it does not cost you to use your imagination. I don't mean blue smoke and mirrors, I mean planning. I think we can develop a plan, and I would certainly have no objections to getting input from the Federal authorities on this kind of plan.

I have some input, and they have indicated strong support for any kind of regionalized plan. They are willing to put money into those kinds of plans. It is obvious that it is spreading dollars further and faster than it would if it was into one specific project. I think we could determine very closely what kind of perhaps matching funds would have to be made available. I would say in the case of the planning monies per se that that money need not be matched. I think that money is a direct grant; it is direct grant monies. It comes without any strings attached other than probably a semi-annual and final report of what the final plan is and how it is being utilized.

So, I am saying to you that I realize the appropriation process is difficult at this point, but I think even absent from it would be planning and some type of imagination, and I know we have it. We can directly involve federal monies, which I recommend that we disperse to those counties that are developing processes, and at some point when we are able to, we might want to earmark some monies from state funds specifically for this process. I think we ought to do that anyway. I don't know if that addresses the question: Is it necessary? Yes, it is necessary, because the specific area that this bill addresses itself to is specifically excluded from the Solid Waste Management Bill.

SENATOR RUSSO: If there be no further questions from the Committee of Assemblyman Van Wagner, we want to thank you very much for taking the time to be with us today.

ASSEMBLYMAN VAN WAGNER: Might I also congratulate you. I have been the recipient of your reports and Mr. Paulson's reports, and information that you have developed, and it certainly has been helpful to me. I would just like to publicly commend you.

SENATOR RUSSO: Thank you very much. Congressman Forsythe or his representative, Mr. Dinterman.

And, while we have the next witness coming forth, gentlemen, rather than extend the day into a very, very long one by taking a break for lunch, because of

the unavailability of facilities nearby, I sent for sandwiches for the Committee. Hopefully, that will carry you through, so that we don't have to stay all day. We will not break; we will continue with the witnesses. We have a lot of them left. If the reporters need a break at any time, you can just let us know.

Mr. Dinterman, you are representing Congressman Forsythe.

T E D D I N T E R M A N: Mr. Chairman, thank you very much for the opportunity to appear before you today and address some of the environmental problems plaguing the New York Bight. My name is Ted Dinterman. With your permission, Mr. Chairman, I would like to go ahead and read my statement. I got up this morning at four-thirty to catch a six A. M. train up here, so even reading will tax my ability at this point.

SENATOR RUSSO: Well, perhaps what we could suggest to you, although it is up to you, since we have your statement, perhaps you could summarize it, rather than read it in full, although feel free to do so, if you wish. I am just trying to think of how we can economize your time and ours, and it might be better to just summarize it, if you are able to.

MR. DINTERMAN: I think it is fairly brief, so I will read it.

SENATOR RUSSO: Whatever you wish.

MR. DINTERMAN: My name is Ted Dinterman; I am a Fellow from Stanford University's graduate program in Technology Assessment and Resource Policy. I am currently working with the Subcommittee on Fisheries and Wildlife Conservation and the Environment of the House Merchant Marine and Fisheries Committee and, in particular, with Congressman Edwin Forsythe, the Ranking Minority Member of the Subcommittee.

Congressman Forsythe regrets being unable to attend this hearing, but since the House is in session today, Congressman Forsythe has Committee responsibilities and business on the floor of the house which prevents him from leaving Washington.

The Congressman and I have reviewed some of the legislation pending before your Committee regarding Clean Oceans and we wholeheartedly endorse their goal. The need to end ocean dumping in waters off New Jersey's and New York's coast is urgent. Many of the steps proposed in the pending legislation would rapidly end ocean dumping and promote research into alternatives. These steps are promising and we look forward to hearing of the progress of these measures before your Committee.

Last week Congressman Forsythe introduced a bill to amend the Marine Protection, Research and Sanctuaries Act, commonly known as the Ocean Dumping Act. This bill, called the Ocean Dumping Amendments Act of 1977, has been co-sponsored by a number of Merchant Marine and Fisheries Committee Members, including Full Committee Chairman John Murphy of New York.

The bill sets a firm deadline of 1981 for ending ocean dumping which unreasonably degrades the marine environment, including the activities of New York, Philadelphia, Camden, and a number of industrial dumpers. For the interim period, the Ocean Dumping Amendments Act imposes a substantial penalty fee on harmful ocean dumping activities.

The penalty fee will be established to make the cost of ocean dumping comparable to more constructive means of waste disposal. The inequitable situation where ocean dumpers save themselves money at the expense of the nation's recreational and economic resources will be terminated.

The revenue generated by the penalty fee will be used for research and site-specific investigation in order to implement constructive alternatives

which convert wastes into compost, sanitary landfill, or natural gas substitutes. With this site-specific research, phaseout schedules will be met, and we believe ocean dumping can be phased out before 1981.

We feel that the legislation you are considering and the bill which Congressman Forsythe has introduced are critical. They attack ocean dumping at its source. Only if constructive alternatives for waste disposal are implemented can ocean dumping and its environmental damage be ended.

While all agree that ocean dumping takes a great environmental toll, we do not believe ocean dumping has any relevance to the algae bloom and subsequent fish kill in 1976. After carefully reviewing the scientific evidence, we are firmly convinced that ocean dumping of sewage sludge played no significant role in this fish kill.

Scientific workshops have summarized last summer's environmental catastrophe as follows:

First, a massive bloom of algae appeared early in 1976 along the edge of the Continental Shelf from Cape Hatteras to Cape May;

Second, as the algae moved shoreward, it decayed, using up oxygen;

Third, abnormally warm and sunny weather conditions created a situation where surface and bottom ocean waters did not mix; so when bottom waters became oxygen-depleted, no new oxygen was available; and

Fourth, finally, the lack of oxygen in bottom ocean waters caused a massive kill of marine life - in particular, bottom-dwelling organisms such as surf clams.

In sum, the fish kill appears to have been largely controlled and caused by natural phenomena.

The role of ocean dumping in this fish kill is, in the opinion of the scientists involved, insignificant. A high official in the National Oceanographic and Atmospheric Administration has indicated that ocean dumping had "a negligible effect" in the fish kill. Scientists of the distinguished American Society of Limnology and Oceanography have determined that disposal of sewage sludge "had no statistically significant effect on phytoplankton growth rates."

There are two principal reasons why scientists so firmly conclude that ocean dumping did not play a major role in the fish kill. First, ocean dumping of sewage sludge contributes only a very small percentage of the contaminants introduced by humans to the New York Bight - including less than 4% of both the nitrogen and phosphorous nutrient input and an insignificant microbial load. Naturally occurring nutrient levels may well exceed human-induced levels, so the ocean dumping of sewage sludge is a very small part of the overall picture.

Second, the New York Bight dumpsite had normal oxygen levels throughout the summer. Measurements taken during the height of the fish kill show that oxygen levels at the dumpsite were much greater than the levels measured along the New Jersey coast where the fish kill did occur, and were two to three times as great as the danger level. If the ocean dumping of the sewage sludge were at all responsible for the fish kill, one would expect at least some sign of oxygen depletion at the dumpsite itself.

It has been argued that moving the dumpsite to the edge of the Continental Shelf will reduce the likelihood of future fish kills. The scientific evidence does not support this argument. Ocean dumping at the present site had no significant effect on the fish kill. Moreover, the algae bloom began on the

edge of the Continental Shelf, so if moving the dumping activities to the 106-site is to have any effect on future fish kills, it would tend to slightly increase their likelihood and extent of future fish kills.

We agree with NOAA that the dumpsite should not be moved for the following reasons:

One, public health agencies have no evidence that the existing site is a threat to the health of people using beaches;

Two, dumped sewage sludge remains in the immediate dumpsite area;

Three, the effects of sewage sludge dumping are minimal in relation to the larger inputs of contaminants from other sources; and

Four, no significant improvements in water quality of the Bight Apex are anticipated by removing sewage sludge dumping.

We fully concur with the high NOAA official who states, "... our goal should be the more important one of adopting management practices that provide the greatest total relief to the marine environment with economic and technological constraints. Remedial measures should address this issue and not the more politically expedient but ineffective action."

We particularly oppose the dumping of sewage sludge at Deepwater Dumpsite 106. The sensitivity of biota, the likely impact on fisheries, the difficulty of policing, the high probability of short dumps, and the impossible task of thoroughly monitoring adverse impacts on the site clearly indicate that dumping at the 106-site could be an environmental nightmare.

In conclusion, Mr. Chairman, we strongly support your efforts to end ocean dumping and we hope we will have your support in our efforts to accomplish the same goal. The environmental problems of the Mid-Atlantic are complex, and we strongly believe that the opinions of scientists involved should be given considerable weight. In this spirit, we have endorsed the finding that the fish kill of 1976 is not related to ocean dumping of sewage sludge. Arguments that the dumpsite should be moved to decrease the likelihood of future fish kills serve to detract from our common concern of ending harmful ocean dumping. We believe the involved parties should devote all available financial resources to implementing constructive alternatives, instead of contaminating new areas by moving the problem from dumpsite to dumpsite.

Mr. Chairman, this concludes my statement. I will be happy to answer any questions.

SENATOR PARKER: You say scientific workshops have summarized last summer's environmental catastrophe as follows, and you list four items. I am familiar with reports by our DEP and also the reports by the National Marine Fishery Service or NOAA at Sandy Hook. What reports are you referring to here?

MR. DINTERMAN: Sir, I am referring to a report called anoxia on the Middle Atlantic Shelf During the Summer of 1976.

SENATOR PARKER: Would you provide us with copies of that for our Committee?

MR. DINTERMAN: Surely.

SENATOR PARKER: When was that put out?

MR. DINTERMAN: That was put out in November, I believe, of this past year. That would be November of '76. It was sponsored by the International Decade of Ocean Exploration within the National Science Foundation. It was held in the middle of October. I think the State of New Jersey sponsored a workshop forum similar to this and the report should be out shortly.

SENATOR PARKER: Well, I don't know whether the State of New Jersey has sponsored any specific workshop as such. I know there have been some at Sandy Hook.

MR. DINTERMAN: Right, those are the ones I am referring to. I am not sure whether it was the EPA or the State of New Jersey who sponsored that.

SENATOR PARKER: I thought it was National Marines Fishery. I am not sure.

MR. DINTERMAN: I am not sure, either.

SENATOR PARKER: Does the Congressman's bill provide funding for alternate sources? Does it provide monies, appropriations, or what?

MR. DINTERMAN: Yes, sir, it does. There are two different areas. First, its approach to ocean dumping, I think, is philosophically similar to your bill, S-1804, in that a penalty fee would be imposed on the dumpers, and that money would be directed toward research into alternative means of disposal. And the second area of Congressman Forsythe's bill is that the responsibility for research into alternatives under the Ocean Dumping Act, which is now within the National Oceanographic and Atmospheric Administration, would be transferred to the Environmental Protection Agency, and the hope is that we will be able to get more funds for them to do the research.

SENATOR PARKER: All right. How soon could we expect--- First of all, are there any other bills in on this subject?

MR. DINTERMAN: This is the only bill that I have seen within our committee on the subject. We have a number of co-sponsors within the Committee, including the full Committee Chairmen and the Ranking Minority Members and the Committee Chairman of the Oceanography Subcommittee and the Fisheries and Wildlife Conservation and Environment Subcommittee.

SENATOR PARKER: Well, is there any realistic hope that this bill will pass, number one, politically, and number two, practically with funds that might be available to the State?

MR. DINTERMAN: Well, with the co-sponsorship that we have, we are very hopeful that action will be taken early. Oversight hearings on the Ocean Dumping Act are scheduled sometime in May or June.

SENATOR PARKER: How much money do you figure this bill would raise?

MR. DINTERMAN: It will depend on the site specific estimates of the cost of alternatives, so the number isn't firm yet, but the money charged will be designed so that ocean dumping will be as expensive or more expensive than the constructive alternatives that the dumpers have in mind to phase out dumping by 1981.

SENATOR PARKER: Don't we really need a massive infusion of money, a block grant, or some kind of money from EPA or from Washington to assist us? I realize the state is going to need a substantial effort, and that is why we have bills in to raise money to provide for alternate sources.

MR. DINTERMAN: We certainly agree that the more money available, the sooner the problem will be sufficiently addressed, and one of the difficulties we have with moving the dumpsite to 106 is that we are taking a significant amount of financial resources and devoting it to transporting wastes 106 miles off the shore, and those monies would be better directed at the research into alternatives in getting at the source of the problem.

SENATOR PARKER: To construct pyrolysis, and so forth, and recycling plants and so forth?

MR. DINTERMAN: Yes.

ASSEMBLYMAN KOZLOSKI: Could you give me an example of how the penalty fee works, a practical example?

MR. DINTERMAN: Okay, any county we wish to consider is right now spending a dollar amount per year to dispose of their sewage sludge. Let's say some estimates, a ballpark figure, might be \$35 a ton, and they will apply to EPA for an interim permit to cover certain amounts of waste, so we will figure out how much they are spending each year to dump them into the ocean. We will also calculate how much they would spend if the alternative were in place, if they had a more constructive, less environmentally harmful, alternative in place, and that difference which may be \$40 to \$50, depending - the numbers would vary from region to region - it would be the amount of money they would be required to devote to research into the alternative and conduct site-specific investigations.

MEMBER OF THE AUDIENCE: Will you take a comment from the floor?

SENATOR RUSSO: No, I don't think we should. If you are not on the list, we will be glad to add you at the end, but I think if we get involved in that, we will have chaos. If anyone does wish the Committee to ask any speaker a question, feel free to jot a note down and we will be glad to accommodate you. I just think we have to keep some order.

MR. DINTERMAN: I would also be very glad to speak to you, if you have some free time, and I will take your comments back to the Congressman.

SENATOR RUSSO: We would be glad to add you on as a speaker.

MEMBER OF THE AUDIENCE: I am a member of a group. I am on the list.

SENATOR RUSSO: We will be glad to have you speak as your name comes up on the list.

Are there any other questions from the Committee?

SENATOR MC GAHN: Are there any cost analyses of basically what costs are going back to the individual taxpayers as a result of upgrading this particular bill? Capital costs or capital construction of facilities as an alternate for sludge dumping is one thing, but eventually, the costs will be going back to the individual taxpayers for that service. Do you have any analyses with the group that you are with as to what the cost of upgrading this is going to be and alternate methods of disposal?

MR. DINTERMAN: The best cost estimates we have seen are the ones from the EPA or the Interstate Sanitation Commission; but, no, sir, we ourselves don't have the capability to make those kinds of cost estimates.

SENATOR RUSSO: Thank you very much. Commander Lawrence Swanson, United States National Oceanic and Atmospheric Administration.

L A W R E N C E S W A N S O N: Mr. Chairman, we do have a few slides, if you would bear with us. Mr. Chairman, I appreciate the opportunity to testify before your Committees concerning the marine environmental problems in the New York Bight.

"Creeping sludge," "fish kills," "oxygen depletion," "floatables" are terms that are becoming all too familiar to those of us living in the coastal regions of New Jersey and New York. What causes these problems? Have they occurred previously? Can we manage our resources so that we can lessen the chances of future events? The answers to these questions are complex, and often confusing, even to the point of appearing to be conflicting.

However, we do have a great deal of scientific information that has been collected over the past five years or so. This new knowledge has assisted us greatly in examining the marine environmental episodes which seem to occur with increasing frequency. If we use our knowledge and past experience wisely, we can make progress toward improving the quality of the marine environment

adjacent to New Jersey and New York. Typically though, we tend to look for simplistic actions which often contribute little to overall solutions to the problems. I hope that, having this opportunity today, we can explain some of the complexities and give you a little perspective into our view from the scientific community.

I might add also that I will leave for the record a report that has just been printed concerning the pollution problems that we experienced on Long Island this past summer.

SENATOR PARKER: Could you provide enough for all the Committee members, is that possible?

MR. SWANSON: Yes. This is a slide showing you the number of sources of ocean dumping activities in the New York Bight Apex area. I don't think I will go over the quantities that are put in on average. You have probably seen those numbers sufficiently in the past. In order to help assess the significance of man's waste in the New York Bight, we have sponsored a recently completed investigation that identifies the sources and magnitudes of contaminants put into the Bight. The study examined contaminant loads contributed by barge dumps, these being sewage sludge, dredge material, waste acid and chemical wastes.

It also looked at atmospheric fallout, waste water, both municipal and industrial, and runoff. Mass loads were computed on the basis of data available from numerous regulatory agencies. It should be emphasized, however, that this analysis does not provide insight to the availability of these various sources of contaminants to the water and to the marine organisms. However, the conclusions are still very important.

To summarize some of these, dredged material contributes the major portion of the heavy metal input to the Bight, depending on the matters between 24% and 80%. The exception to this is mercury. Seventy percent of the mercury is attributed to waste water. Sewage sludge dumping contributes less than 6% of the heavy metal load. Essentially all contaminated dredge material is disposed of at the designated site in the Apex. Consequently, the percentages become even more impressive when adjusted to include the Apex alone.

What I am trying to say is that these numbers are computed on a Bight-wide basis and not strictly on inputs to the New York Bight Apex just surrounding the dumpsites.

Organic carbon primarily comes from wastewater, dredged material, and gaged and urban runoff.

Municipal wastewater and gaged runoff contributes 65% of the nitrogen to the Bight while dredged material and atmospheric fallout contribute most of the rest. Municipal wastewater and dredged material account for 80% of the phosphorous.

Unchlorinated municipal wastewater and urban runoff from combined sewer overflows contribute the bulk of the microbial load.

Wastewater is identified as playing a significant role in contaminating the Bight Apex via transport through the oceanic boundary from the Lower Bay. The drainage basin feeding through this boundary is some thirteen thousand square miles on which there is large primary and secondary wastewater discharges. In addition, New York City now has approximately 450 million gallons per day of raw sewage discharging into the Hudson River. Of course, this figure vacillates greatly depending on the circumstances at the time.

What we know about the Bight Apex is that the physical oceanographic processes in our coastal region generally tend to thoroughly mix contaminants introduced into the Bight. To a certain extent, topography limits the area over which flushing of the system can take place. The shape of the coastline and the Hudson Shelf Valley are particularly important to the modification of the generally southwestwardly quasigeostrophic flow along the Middle Atlantic Coast. Apex circulation is further complicated by the seasonal variation of water column density.

MESA investigators have sampled the oxygen content in the water column of the Bight Apex periodically since 1973. With the exception of that portion of the year when a strong pycnocline exists, dissolved oxygen would be expected to be and has been found close to saturation. In 1974, oxygen levels in the topographic depression at the head of the Hudson Shelf Valley were as low as 30% saturation. Saturation in bottom water of 60% was not uncommon for a good portion of that year. Last year dissolved oxygen was eventually depleted in bottom waters.

Nutrient chemistry of the waters of the Bight Apex is similar to that observed for other shelf waters in temperate climates. In spring, when the pycnocline is developing, surface nutrients are rapidly depleted. Below the pycnocline and compensation depth, the distribution of nutrients remains stable. In summer, the Hudson-Raritan estuarine complex serves as a source of nutrients to the Bight Apex. In fall, with the breakdown of the pycnocline, the nutrient supply from deeper waters, serves to replenish the supply of nutrients throughout the Apex region.

Annual phytoplankton production has been calculated to be 370 grams per square centimeter for the Apex. These values are similar to those for upwelling systems, and for Long Island Sound. This high productivity is attributed to the continuous source of nutrients from the Hudson-Raritan estuarine complex during the summer months.

We can summarize our present knowledge: The Bight Apex is a complex oceanographic regime which is a highly productive system, heavily impacted by man largely through massive inputs of nutrients and contaminants introduced through the Hudson-Raritan estuarine system.

If this is the general state of the marine environment, why then did we experience severe oxygen depletion and associated fish mortalities in 1976 as opposed to previous years?

The summer of 1976 saw mortalities of about 25% of the surf clam stock off the coast of New Jersey. The immediate cause of the mortality was the low dissolved oxygen and associated hydrogen sulfide concentrations below the pycnocline. The less mobile organisms such as crabs, lobsters, cunner, and ocean pout were primarily affected. The area affected was from three to twenty nautical miles offshore, eventually measuring to extend the entire length of the New Jersey Coast.

This past year, however, is not the first occurrence of such a phenomenon. Three previous fish kills of this nature have been reported in the last eight years. The one in 1968 was the only one that was nearly as extensive as this past year, however.

We now know that the potential exists for the Apex of the Bight to become anoxic every summer around July or August. This potential exists even without the impact of ocean dumping. In 1976, the chain of events leading to the anoxic condition began early in the year. Early spring warming seems to have led to the

early development of the pycnocline, thus decreasing replenishment of oxygen to the lower water layers. This occurred up to two months earlier than normal. Stirring of the Bight water column by storms occurred only six times during the period February through June, far fewer than the more typical number of thirteen. Data from current meters deployed in the Bight show that the circulation was in fact sluggish in 1976 compared to 1975. Thus, it seems probable that these climatological conditions were very influential in causing the oxygen depletion.

I should point out that the conditions that we are now experiencing again this spring are very likely to lead to the formation of a thermalcline again, perhaps for a slightly different reason, but we have a great deal of fresh water input coming out of the Hudson River now as a result of a very heavy snowfall and we are also now beginning to get spring warming a little bit earlier than one would expect, so conditions exist potentially to have a repeat.

This past year there was another interesting and important phenomenon significant in terms of the oxygen depletion. As early as January, 1976, a bloom of the dinoflagellate *Ceratium tripos* developed in the New York Bight. The bloom apparently was a shelf-wide phenomena, and not a response to local or nutrient enrichment. As the season progressed, the bloom built up near shore parallel to the New Jersey coast, and concentrated just below the pycnocline. By June, the organic material from the bloom died off, fell to the bottom, further depleting the dissolved oxygen content of the bottom waters.

It thus appears that the best assessment of the fish kill is that it resulted from a sequence of natural events which were sufficient to stress the coastal waters to anoxia or at least near anoxia.

The appropriate question to ask is whether man's inputs were sufficient to induce anoxia in a system just on the verge of going anoxic. We do know that man and his activities contribute large quantities of carbon and nutrients to the Bight, mostly to the Hudson-Raritan estuarine system, which would not otherwise get there. We also know that this carbon can add to the depletion of oxygen from bottom waters, and that the nutrients stimulate phytoplankton production some of which also helps to deplete dissolved oxygen.

We do not yet know how much of these wastes must be retained on land in order to relieve the strain that now exists on the system. The MESA project hopes to support development of a model which will answer this question. Alternatives to ocean dumping of some of these wastes is desirable and encouraged, but it is unlikely that the elimination of the sewage sludge dumping would have a perceptible impact on water quality of the Bight Apex or on the anoxia problem. Moving the sewage sludge dumpsite around in the ocean to meet the crisis of the moment is not going to solve any of our problems.

We do know that the natural processes are perfectly capable of establishing conditions favorable to anoxia no matter what modifications or controls man places on the system.

What then should we do? Certainly mankind has badly abused the coastal waters and we must make every intelligent effort to relieve the stress that we have placed on the system. The largest sources of of man's contaminant inputs add to the problem of municipal wastewater, urban runoff, and dredged materials. The primary target for our resources and efforts should be that of cleaning the Hudson-Raritan estuarine system. This is of necessity a time consuming and costly process.

That concludes my statement, Mr. Chairman.

SENATOR MC GAHN: Thank you very much. Senator Parker.

SENATOR PARKER: I am a layman, obviously, and I have lived here all my life along the coast, and I have never seen a situation like we had last year. I spend most of my time in the ocean fishing during June through August. Why now do we have it if it is only natural causes? Why have we not had it, as far as I know, back to the early days in this country?

MR. SWANSON: Well, there are probably several things that contribute to that. First of all, we have not looked in the past.

SENATOR PARKER: Well, you don't have to look. I know when the water turns black. I know when the kids come in with algae all over them.

MR. SWANSON: May I finish?

SENATOR PARKER: Surely.

MR. SWANSON: Thank you. People have not looked very much in the past. We have experienced the same thing with the trash in Long Island Beaches. The old time residents claimed that last year really wasn't as bad as a lot of the press and so forth built it up to be. It is just simply that there are more people. We have a capability of getting out into the ocean a little more than we have in the past; people are more interested, so the problem is more obvious.

However, as far as last year in particular is concerned, I think if you took the probability of events that occurred, you would find that it was something that probably occurred only once in twenty-five or thirty years - the early spring warming, the ceratium bloom. The scientists that have been looking at ceratium still haven't the foggiest idea why there should have been a shelf-wide ceratium bloom. It is typically not there in that magnitude. And one of the problems is that ceratium does not have a predator that would help solve the problem. So I think that last year was climatologically very unusual.

SENATOR PARKER: Well, I really can't understand your testimony, that it is basically as a result of the environment and nothing that we have done. The ocean on two occasions turned black, the color of your table. I was there. The fish came to the top and died. During the course of the summer, all during the course, even though we may not have seen it, the kids who were surfing offshore just a little bit came in with their wet suits all covered with the algae, not for just one day, but during the whole summer. On July 17th, or whatever day it was, when I came in from offshore fishing, the color of my boat, which is white fiberglass, was the color of that table. Never, in thirty-two years since I have lived on Long Beach Island, have I ever seen that, and I have never heard of it ever occurring prior to that, and now you are telling me it may happen again this year.

MR. SWANSON: I am saying that the climatological conditions this year are favorable at this time.

SENATOR PARKER: And you are telling me that there is nothing that man can do, or has done, contributed to it or is causing the problem?

MR. SWANSON: I didn't say that. I didn't say that at all.

SENATOR PARKER: Maybe I misunderstood that.

MR. SWANSON: I said man's input certainly has aggravated the system. I have said that the Hudson-Raritan River is a very serious problem as far as water quality problems are in New York. I have said that sewage sludge dumping is not the problem that it has been made out to be by any number of groups. And if you want to improve water quality, you have to attack a problem that is far bigger than sewage sludge dumping.

SENATOR PARKER: And that means setting what, water quality standards throughout New Jersey that would impose restrictions on the delivery of water into the system, into the estuary that brings it out?

MR. SWANSON: I think that is certainly something that has to be examined. The combined sewer system of New York City has to be looked at.

SENATOR PARKER: Most of us are aware that is also a problem, and we are trying to do what we can. I don't know that anything is being done except a suit by Long Beach Island Township, as far as I know. But these bills which we have before us, if we attack them on the basis of, number one, stopping sludge, number two, providing alternative sources of disposal of solid waste, and upgrading our sewer plants to secondary treatment, would that, in your opinion, solve our problem?

MR. SWANSON: I am not a sanitary engineer. But as I understand it, if our problem is one of nutrient enrichment, secondary treatment probably will not solve the problem.

SENATOR PARKER: Is that our problem, the overenrichment? Is that the problem?

MR. SWANSON: I am not that familiar with the particular geographic area you are talking about. Certainly nutrient enrichment---

SENATOR PARKER: In the New York Bight, is the problem that gave rise to the algae bloom and the oxygen depletion a result of overenrichment or overabundance of nutrients in the area?

MR. SWANSON: Overabundance of nutrients probably contributed to it, but there is a physical reason why oxygen was depleted last year below the pycnocline, and it was directly related to climatology, to begin with, and then secondly, we had the unusual ceratium bloom that was Bight-wide early in the year, and then moved in shore towards the summer.

SENATOR PARKER: Now, you are saying that there is a very strong possibility this will happen again.

MR. SWANSON: I am saying that the climatological conditions for the development of an early pycnocline seem to be here. We have a lot of fresh water coming out due to the heavy snow melt. We are starting to get some spring warming, so that the potential exists that we can have early stratification, and if we have early stratification, we can expect what happens to the oceanography of the region, that the oxygen will start being depressed earlier in the year than is typical.

SENATOR PARKER: Let me ask you another question on the dredge. You have answered me about the runoff, and apparently we are going to have to have some statewide standards similar to those maybe that are being promulgated for the "pinelands." But since dredging is such a major problem - and the Congressman, or someone, said that it will cost \$750 billion to create an artificial island to dump the dredge spoil in the lower New York Harbor, and I realize we don't have much say over the Federal Government, and I assume somebody is here today to speak for them - why couldn't ecologically or scientifically an artificial island be created in lower New York Harbor, and then filled, to take away what dredge spoil is necessary to keep the harbor open.

MR. SWANSON: I think that is certainly a possibility. As far as the technical problems associated with it, I don't feel that I am capable of commenting on that without going into some considerable review. But, certainly, I think it is an alternative that should be examined. But, again, that is a short term solution.

I think they are talking about solving the problem for twenty years, and then you are going to have to do something else.

SENATOR PARKER: I don't mean to criticize you, but I think what you have told us here today, and what I am afraid we are going to hear from the rest of the witnesses, is the problem that we face. I, as a legislator, and my constituents, the people who live on the beach, the people who depend upon it for their income and their livelihood, the problem we have to face is that everybody says, well, this aspect of it is not my problem, and we run into this bureaucratic difficulty; and we are a part of it, because I am a legislator, and I know what is going on. If we don't take a simplistic attitude and say, all right, we are going to stop this by imposing restrictions on this, then we have no way of combating the problem or effectively taking any action to stop it. That is editorializing, but I don't know what else we can do. You are not advocating here today that we do nothing, are you?

MR. SWANSON: No, I thoroughly encourage you to end ocean dumping. I just want you to realize that when you end the ocean dumping of sewage sludge, in my opinion -- and the opinion of the people I work with, data we have gone over -- the water quality of this system out here is not going to be improved. And I think before you spend great quantities of money and other resources, you should consider that fact very carefully. I think we all want a better marine environment out here, and we know that our resources are limited, so we have to use them wisely.

SENATOR MC GAHN: Thank you very much. Actually, I think you have touched upon a subject that has not been brought up before this, and that is that probably the sewage sludge was not actually the main cause of the algae bloom last summer. Congressman Forsythe's aide has stated that also as you have, and I am sure that Dr. Glenn Paulson will come up with testimony comparable. We face the problem here then on a priority basis of coming up with a solution. As you say, and I incidentally happen to agree with you, ending sewage dumping at this time probably would have no effect. Unfortunately, it is the one visible thing, and I think as a politician, we certainly tend to attack that which is visible. However, there are many other things that actually are much more detrimental.

All we have to do is look at Philadelphia last year and the legionnaire's disease. To this day, they don't know what caused it. So, there are a number of problems for which there are no easy solutions. On a priority basis, as far as this State is concerned, we do have several approaches. One is to support the increased advances of water treatment plants, and secondary sewage disposal. Of course, then we have to look for a way to dispose of our sludge on land. The other is, I mentioned before, have the water quality control bills enacted, by which DEP then would be able to permit certain individuals to pollute, and bring that down and get a fee. Both these, I think, would simply over the longrun cut down on the percentage of nitrites and phosphates and nutrients that are going into the ocean.

It is a long procedure, and unfortunately it is not just a problem for New Jersey alone. The problem, even though the southern beaches get most of it, is actually coming from New York. I think we might find, ourselves, that the cities of Newark and Jersey City, or Camden for that matter, at the present time dispose of their sludge by dumping, but they might not always be in agreement with some of the methods we might be fostering down along the coast here. So, my question to you is, what would be the best policy for us to adopt concerning

alternates for sludge disposal on a long term basis between now and 1981, and at the same time promote more of our efforts to upgrade the waste water treatment and other things like that?

MR. SWANSON: Basically, I agree with your statement. I personally believe that the 1981 date to end ocean dumping is an admirable step in the right direction. I don't believe that a short-term alternative is moving the sight from one place in the ocean to another until 1981. I think, though, now is the time to start a program that examines some of the things you were referring to, particularly the problem of the Hudson River, and realize that it is going to be a costly process, and probably the fruits to be gained from it are fifteen to twenty years down the line.

SENATOR PARKER: But we do have to start, and we have to start somewhere. The easiest way to start, it would seem to me, would be to find alternate sources, such as pyrolysis, mulch, and various other ways to use the dried sludge. There are existing facilities. I get literature from these people all the time.

Don't we have to take most of these steps and insist that they be followed, in order to clear up the nutrients, and the various other things that are polluting the waters, now?

MR. SWANSON: Yes.

SENATOR PARKER: Well, let me ask you one other thing. It is my understanding, from all that I have read, that it was the over-enrichment - except for the Littoral Society in their latest magazine, who said it was the microscopic analysis of the sludge on the flora, which didn't microscopically show any skeletons or anything else that would come from decayed plankton, but that it was sludge - of this area caused by natural phenomenon, thermalcline, too many phosphates, too many nitrates, and everything else? Do you agree that there was an over-enrichment that caused this from the nitrates and phosphates?

MR. SWANSON: I believe that the system last year could have gone anoxic without man's input. I can't prove it, and I don't think anybody can. I also believe that the situation was further intensified, however, by the addition of man's nutrients to the system. The system might have gone to 85% anoxia, and the additional stress that mankind put on it, maybe pushed it over the top. That is the situation as I see it.

SENATOR PARKER: Well, we have to deal in probabilities, and from the probabilities, not the absolute scientific end, is it probable that this is what occurred, that it was because of man's putting the nutrients into the system that caused it to do this?

MR. SWANSON: It is possible that man's additions caused it to go just over the brink to anoxia. Certainly, man's inputs of nitrates to the apex area should be limited, if at all possible. They are contributing problems, as far as production is concerned. The system can't assimilate it.

SENATOR PARKER: But do you agree that we should stop all dredging, or at least find additional spoil sites rather than offshore? Do you agree that we should stop sludge dumping? Do you agree that we should stop dumping raw sewage in there, because they do contribute to this problem?

MR. SWANSON: I have agreed to most of those things for a number of years. I agreed that raw sewage probably should not be put into the river. I agreed to end ocean dumping. I agree that we have to get better control on the nutrients

that we are putting into the system. I have agreed to all this.

SENATOR MC GAHN: The only problem is, there is no free lunch. Incidentally, we will continue conducting hearings through the lunch period, so if anyone wants to go out to lunch, if you are one of the next several speakers, we suggest that you stay.

I think, Barry, to put it more simply, the long dispersal process, whereby the ocean would disperse the nutrients put into it, for the chronological reasons that were mentioned by the Commander, last year simply didn't occur. There was no stir. This then cut down on the oxygen saturation; the algae, or the organisms present, used up more oxygen, so that consequently the oxygen level went down, and this occurred. I think that certainly if there were zero pollution at the present time, that there still would be the potentiality of this occurring next year. If you went to zero pollution in the water, you are talking in terms of a fifteen or twenty-year period before actually the ocean would simply get back to what it has been.

SENATOR PARKER: Joe, that simply floors me. This is the thing that I just can't fathom. You are a Doctor, and you have lived in Atlantic City all your life. Have you ever seen anything like this before?

SENATOR MC GAHN: Oh, yes, I have seen it before.

SENATOR PARKER: Where? In the ocean? Never. Joe, come on.

SENATOR MC GAHN: We didn't see it in Atlantic City last year.

SENATOR PARKER: No, but it got to Brigantine. But you can imagine what that will do to your casino gambling next year, with that smell.

SENATOR MC GAHN: It could be worse; we could have the legionnaire's disease.

MR. SWANSON: You have been dumping these same wastes out there for thirty-five or forty years.

SENATOR PARKER: And don't you think that over that period of time that this has continued to generate and continued to over-enrich it for a period of years to the point now where man has despoiled it, as opposed to the natural consequences? Why doesn't this happen elsewhere in the world, these algae blooms where all the fish die, and you have this massive kill?

MR. SWANSON: It does.

SENATOR PARKER: Where?

MR. SWANSON: Mobile Bay is a good example. The people go out with their baskets and try to catch the fish as they jump out of the water because there is no oxygen. And the Baltic is another example.

SENATOR PARKER: Where there is no population concentration such as you have in Mobile, where has it occurred where we haven't had a tremendously large population dumping their residual wastes into the ocean?

MR. SWANSON: I don't know. I can't answer that.

SENATOR PARKER: It just flabergasts me, to say that it is occurring here as a result of a natural consequence, and it is going to occur possibly this year, all the elements are right for it to do it this year again, and it isn't attributable to what we are putting into the ocean.

MR. SWANSON: The oxygen content in the bottom waters, the barrier area that was a problem last year was ten to eleven parts per million in February. Now, that is probably very close to saturation. I haven't figured it out.

SENATOR PARKER: What do you mean, saturation, good or bad?

MR. SWANSON: It couldn't hold any more oxygen. And, you know, if man's inputs were depleting the oxygen over the twenty-five or thirty years to the point where it was steadily going down, we wouldn't be ever reaching saturation again. The system is getting regenerated.

SENATOR PARKER: With the tides, the flows, and the littoral drifts bringing different waters in, cold water, doesn't that affect it?

MR. SWANSON: Sure, stirring affects it. What I am saying is that last year we had a system in which you essentially isolated the bottom waters very early in the year. There was no stirring. The system was completely sluggish, and so the oxygen had a tendency to be depleted just naturally. If you put the ceratium bloom on top of it, the thing went to zero.

Now, I agree totally with you that the input of nutrients can and probably did contribute to the problem. The only thing I am trying to say is that the system was very close to going anoxic, if not in fact going anoxic just because of climatology and existence of the ceratium bloom. And the ceratium bloom apparently had no relation to dumping, because it was a Bight-wide phenomena.

SENATOR MC GAHN: I think you are correct. I think we can assume that certainly man and the products of man's wastes is a problem which has evolved here, but I think what we are dealing with today is the specific question of sewage sludge. Now, I think testimony has been offered by several individuals that only about 5% of the problem is because of sewage sludge. Only about 40% actually comes from New Jersey and the remaining 60% comes from New York State.

Now, the bottom line question here is, even assuming zero sludge dumping, what effect is this going to have as long as we still continue to have waste water runoff, and dredge spoils are an extremely important part of this? This is really the bottom line, Barry.

SENATOR PARKER: I don't think we ought to limit ourselves in these bills, and they don't, to sludge only. In fact, the bond issue bill is much broader. All these, really, are much broader to try and find all types of alternative ways to dispose of not only sludge, but our waste water, if necessary. We have bond issues, and we are in the process of trying to clean up our sewage plants.

Incidentally, we had the engineer from the Ocean County Sewerage Authority, the whole countywide authority, who testified before our Committee a few months ago, and he said that the effluent coming from the authorities along the coast is only 2% of the problem. And in some of these figures I see substantial differences.

SENATOR MC GAHN: He is talking about nutrient enrichment.

SENATOR PARKER: Yes, well, he is talking about nutrient enrichment, too. He said that 2% is from the out-fault line, and it seems as though everybody is saying, it is not my problem, and we just keep chasing our tail. Unless we take some affirmative steps, number one, on the easy things, and move on the easy things that we can put our finger on and start to effectually do something about--- These bills are not just limited to sewage sludge.

SENATOR MC GAHN: Thank you very much. Mr. Richard Dooling, United States Environmental Protection Agency.

R I C H A R D D O O L I N G: Senator Russo, Members of the Committee, my name is Richard T. Dooling, and I am Director of EPA's program for the ocean dumping activities in Region Two. It is our pleasure to be here before you today to discuss this overall complex problem which we agree must be addressed on a bi-state

basis, and we totally endorse any posture that the Legislature might take to end ocean dumping.

Based on some of the comments that I heard this morning, I think it is necessary to briefly review the responsibilities of the various Federal Agencies. Basically, the Coast Guard has the responsibility for police-type monitoring of the sites where the sludge goes in terms of whether the vessel arrives at the scene or it does not arrive at the scene. The Corps of Engineers has the basic responsibility for issuing permits for dredge spoils. EPA designates the site, but the Corps of Engineers actually issues the permit.

The NOAA that you just heard Dr. Swanson discuss, is responsible for the longterm research and monitoring of the New York Bight, the portion including from the tip of Long Island down to Cape May, in that particular area.

Now, our prime responsibility is to issue permits, to make a decision whether a permit should or should not be issued. We also look at alternatives and manage the sites themselves. Before we can issue any ocean dumping permit, we must have a public hearing. The individual state agencies prior to the public hearing have the opportunity to review the permit that we are issuing. If they can demonstrate that the permit we are issuing is going to contravene water quality standards - and water is under their jurisdiction ---

SENATOR PARKER: Excuse me, at that point, how can a layman or any individual do that when everybody, it seems to me, comes up with a different--- First of all, the layman, the average person, doesn't have the expertise, and even the experts have differed as to the causes of it.

MR. DOOLING: We are not talking about the fish kill now, sir. We are talking about the overall problem of dumping sludge in the New York Bight. In regard to the fish kill, I have a draft in front of me of the report that was mentioned by Congressman Forsythe's representative, and I will leave a copy with you. This group was an inter-agency steering committee consisting of representatives from New Jersey DEP, NOAA, U. S. EPA and the American Littoral Society, and the academic community. These groups of scientists came up with an unbiased opinion, from a technical standpoint, of the cause of that particular situation this past summer, and basically it is as Dr. Swanson indicated, they cannot attribute this situation solely to the dumping of sewage sludge, which has become very honestly the environmental whipping boy of all environmental problems in the New York Bight.

SENATOR PARKER: I think the raw sewage is more important, probably, than that.

MR. DOOLING: There is no question that raw sewage is a significant problem. I will show you a slide, since you have brought it up now. This gives you some idea of the problem that you face coming in from the New York Bight in terms of the Hudson River plume that comes down the Jersey Coast. All the raw sewage that would be emanating from, not only New York, but also the inadequately treated waste from such communities as the Passaic Valley, Bayonne, and that area there, are going to move down the shore, and it becomes that much more complex to define and pinpoint the one sole source of a problem that might be appearing in the New York Bight.

SENATOR MC GAHN: Is that the satellite monitor?

MR. DOOLING: These slides were taken from a high altitude U-2 aircraft at 65,000 feet.

SENATOR PARKER: Infrared?

MR. DOOLING: This particular one was not infrared. There is another one with false color that we have.

SENATOR PARKER: We realize that it comes from all sources, and we are guilty too, and we want to address ourselves to what we can knock off in New Jersey and fight like hell to get what we can knock off in New York.

MR. DOOLING: That is why it must be addressed on a bi-state basis. There is no question about that, and New York, as it was properly said before, does contribute between West Chester County and Long Island about 60% of the problem.

SENATOR PARKER: Well, New York City itself has, what, 50 million gallons of raw sewage a day.

MR. DOOLING: It has about 350 million gallons a day of raw sewage; that is correct. Now, the World Trade Center- when they had the previous hearing there- is connected to another treatment plant, so the westside of Manhattan now is the only raw sewage discharge, plus some areas of Staten Island.

SENATOR PARKER: Well, some of us tried to get the Governors of both states not to even allow the trade buildings to open because we knew they would be dumping raw sewage, but that is beside the point.

MR. DOOLING: Basically, in terms of EPA's issuance of permits, at the present time, EPA has issued fourteen permits to municipalities for dumping sewage sludge, and fourteen permits for industrial waste. Last year alone, there were ninety-seven communities in the State of New Jersey that are no longer allowed to dump sewage sludge in the ocean. My hometown of Chatham, which had a permit before, is no longer allowed to address this. I am an Environmental Commissioner there, and our problem is, nobody wants it. I mean, this is a problem that we have to recognize. There is no such thing as zero risk when we are handling sewage or sludge.

There is going to be an impact, and what we are trying to do in effect is to minimize that impact no matter what alternative we might select. The goal of EPA is to phase out ocean dumping. There is no question about that. The Federal Register just came out, and I will pass out copies to you, and I would ask you to address yourself to page 2484. Administratively this indicates that the administrator of the individual region where dumping occurs, where there is impacting on the State's waters, must make a decision regarding removal of that quantity of waste that is causing an impact. This is on page 2484, and in the last column, 228.11c.

It says, "When the EPA management authority determines that activities at a disposal site have placed the site in impact category one" - and impact category one is described in the previous problem in terms of effect on shell fish and sediments - "that the administrator or regional administrator, as the case may be, shall place such limitations on the use of the site as are necessary to reduce the impacts to acceptable loads."

Now, from an administrative and a management standpoint, those words are very easy to implement. The problem is, if we are to move the sewage sludge dump-site to the 106-mile site today, we would have possibly an irreversible environmental impact.

SENATOR PARKER: You know, I agree with the Congressman and everybody else, let's not move the off shore there. We don't have any idea what the effect would be out there. At least we know that we are having problems here, and we ought to limit it. I think most of us agree with that.

MR. DOOLING: Well, legally, the question is, can you move to the 106 mile site? Because the 106 mile site is not designated for sewage sludge; it is designated for chemical waste, so the real question is whether or not legally you can move out there without an environmental impact statement.

Now, to somewhat answer that question, within the next four months, EPA will be holding a hearing here in Jersey, and the hearing will be chaired by such individuals from Woods Hall and other academic communities, and the scientific community, to hear the scientific facts. You are hearing, as we have heard, a multitude of scientific facts that appear contradictory, that appear supplemental, that are very confusing to the public. So what we are asking is that the scientific community have a fact-finding hearing to present technical information, with a recommendation to the Administrator of EPA as to whether or not it is scientifically desirable to move to the 106-mile site.

That means that this year EPA will not be moving to the 106-mile site because we have to go out for public notice in April of this year, which is next month, and we have been making a tentative determination that sludge dumping will be retained at the present site unless scientific evidence which is developed by this hearing indicates the need to immediately move, or, if there is an immediate health threat for the use of the beaches along the coast this year.

We are concerned as much as the legislature is concerned regarding the quality of the beaches, regarding the quality of the floatables. We are greatly expanding. The fact that we are keeping the dumping at the twelve mile site requires us to greatly expand a monitoring program of the beach areas. We will be sampling the beaches at least three times a week by helicopter. They are bringing in a specially equipped aircraft. We will also be sampling three miles out and part of our missions will be to observe floatables. But the point is that we do not feel at this time, based on the technical evidence, that we could substantiate moving the sludge dumping grounds to the 106-mile site.

SENATOR PARKER: Well, as the other gentleman indicated, I think that would be a bad move, just politically, because it would give an alternate place to go, instead of trying to bring it to an end. I question the 1931 deadline for the end of dumping.

MR. DOOLING: That is a goal.

SENATOR PARKER: That is a problem as I see it. Unless we mandate a goal, legislatively here in New Jersey, and hopefully in New York, and I don't understand why the EPA doesn't mandate it, because if you mandate a goal and move it up, it requires alternate means of disposal. Chatham, Mount Holly, Atlantic City, will then have to do something else. They will have to go into pyrolysis; they will have to go into composting; they will have to go into recycling, or whatever you are going to do with your sludge and your solid waste.

MR. DOOLING: Northwest Bergen has a very efficient sewer treatment plant operation. Basically it is a bedroom-type community. The best technology is being applied up there for the combustion and sewage sludge. If we were to apply that technology, we do not solve the problem of heavy metals. The heavy metals still reside in the ash. Now, the ash which is significant in quantities must still be disposed of. The problem also is, if you think you are going to have difficulties with the ocean communities about dumping sludge, the siting of an incinerator or the siting of a pyrolysis unit will now bring to light the

environmental groups or the local legislative groups in Union and the other areas where you are going to put this material. Because when you burn sludge, the mercury which is in the sludge - there is no such thing as sludge without heavy metals in it. I have never seen sludge in this whole world that doesn't contain heavy metals, particularly bedroom-type communities. They violate the mercury level that we are allowed to dump in the ocean. And when you combust this material, it goes up the stack.

SENATOR PARKER: Is there no other way to recycle these heavy materials?

MR. DOOLING: If you look at most of the metals that are in the ash, the bulk of it is iron or some may be mercury; precious metals come to such a low percentage in the point percentages, that economically that cannot be recovered. So your goal then is to really some way fix these metals in the ash, so they will not leach out once you put it in a landfill or in some disposal site.

SENATOR PARKER: Assuming that you can't put it in a landfill site, the metals, after you have gotten to this point---

MR. DOOLING: If you had a sealed landfill, one that was controlled, you possibly could add this material without any deliterious effect, but again, you have to make sure that you are not translocating the problem.

SENATOR PARKER: Why can't you dump that offshore, because you already have, as I understand it, so much mercury in the ocean that doesn't come from dumping. They just come from natural causes.

MR. DOOLING: Yes, but the problem is that you are still having this material dumped in the ocean. The indication that was made before was that you are treating sewage, and now you are taking the sludge, and you are just putting them in two different locations. You are doing the same thing over again.

SENATOR PARKER: Well, let me ask you about the metals. You say in a bedroom community they get these metals. Now, I was led to believe that in that type of community that you did not get---

MR. DOOLING: If you have a dentist's office in any community, you have mercury in your effluent, because when you have the amalgam in your teeth, which is mercury, that material is being discharged from a dentist's office into a sewer system which actually goes into a sewage treatment plant. So that is a source of mercury. There are many other sources of these metals. When you talk about a typical bedroom-type community, that includes hospitals; that includes laundromats; it includes other activities. So a typical bedroom-type community includes commercial establishments which will give you a source of heavy metals, such as a small plating operation, a one or two man shop. You don't consider that a significant industrial contribution.

But the ultimate decision to ban ocean dumping must take into consideration the environmental trade-offs and the alternate environmental impact that must result from whatever decision is made, and it can only be addressed on a bi-state basis, and we totally support any action you might take, positively, to eliminate ocean dumping, recognizing that simply closing the valve, it is going to back up some place else.

SENATOR PARKER: Yes, we have to find an alternate source. What about bio-conversion where you get the methane gas, and/or pyrolysis? Do you still end up with a heavy metal left over?

MR. DOOLING: In the pyrolysis system, you are still left with the char, the briquets, whatever you want to call it, and the metals are still in there.

SENATOR PARKER: Don't we have some way of recycling those metals? I know they are in such minimal amounts, but isn't there somebody who can melt those metals down? Just copper, for instance, is \$50 a pound now.

MR. DOOLING: Yes, but you recover those in the particle size when they exist in the ash. You know, your average particle size of ash is around 15 microns. The average diameter of the particles. You would have to remove certain sized particles selectively to remove those metals. The cost of doing that far exceeds the cost of taking other materials.

We can recycle aluminum much more easily than we can anything else. And yet we will recycle 19% of our aluminum because the idea of recycling is not the way it was several years ago.

SENATOR PARKER: What about in the case of bio-conversion and the methane gas?

MR. DOOLING: Methane gas is nothing new. I used to operate a sewage treatment plant in New York City, and it was 97% self-sufficient. We used to take the gas from the anorobic digestion process, and run our engines, which in turn ran our electrical supply and ran our pumps and whatever have you. The only source of ConEdison power was 1% for emergency battery power, because the gases are being used.

Right now, 50% of the sludge going into the ocean is primary sludge, not secondary sludge. So, really, that is why I anticipated at least a two-fold increase in the volume of sludge they are pouring out there, because the legislative mandate of 1972 said that all sewage treatment plants must have secondary treatment. That is defined as 85% to 90% removal. When you do that, now you are increasing the volume of sludge that must be handled.

Now, we have one plant in New Jersey, the Linden-Roselle that went up to secondary treatment. The volume of sludge they handled in 1975, I think was something tlike 142 wet tons, and it went up to 228 wet tons, so we saw less than 100% increase in the volume sludge that they went to sea with.

SENATOR PARKER: Well, can't you use the gas, and then dry it through, and then use it as some kind of mulch or fiber board, or---

MR. DOOLING: The sludge that goes to sea has the methane gas removed from it; it is secondary sludge. It has been digested already. It has had the gas removed from it.

SENATOR PARKER: So when it is dry---

MR. DOOLING: When you dry it, now you are using it as a source of fuel in a pyrolysis system.

SENATOR PARKER: Or even the ash and stuff that is left over, isn't there any way, even if you just dried the sludge without using it in pyrolysis, it can be used in some commercially feasible fiber board, or some other gypsum type board, or something that---

MR. DOOLING: The answer is yes, but the question really is, how many of you use the waste crank case oil, the oil we used to have years ago? If you buy a \$6,000 car now, you are not going to go to Shop-Rite and buy the 45¢ oil and put it in your \$6,000 car. You want the virgin material, and you will pay

the extra \$1.30 for it. When we had the sludge dumping problem out in Long Island, there was a very affluent community out there, and they had approximately 300 cubic yards a year of sludge that they disposed in the ocean. They have an efficiently operated treatment plant that previously would handle it by de-watering it on a vacuum filter. The local residents complained about the odor, so they stopped de-watering.

Then they went to the county health department and they were able to put it on a golf course. The county health department said after awhile that they had to stop doing that because it was running off into a stream and polluting the stream. So then they said the only alternative was to go out to the town of Hempstead and ask if they would burn our sludge with their garbage, and they said, sure, but the extra cost of fuel - since this material was 60% water - they couldn't afford. Again, it was cheaper to go to the ocean. So they went out to the ocean. I indicated to the Mayor that it would be an ideal situation - we had 300 homes, and we had 300 cubic yards a year - for each home to take one cubic yard a year of sludge and recycle it in their garden. That concept was not acceptable. The concept of putting human waste on our lawns today is not acceptable in this country. We are facing a social stigma in terms of the acceptability.

SENATOR PARKER: Every European country and every Asian country does it.

MR. DOOLING: Ninety percent of the Asian countries have intestinal parasites, because they put raw sludge down. Our country here has wiped out typhoid. We have wiped out many diseases on the basis of not taking the gamble.

ASSEMBLYMAN BASSANO: Can I interrupt one second? Is it not a fact that Milwaukee recycles their sludge in the form of organite which is sold on the market as a fertilizer?

MR. DOOLING: That is right. But the thing that makes Milwaukee sludge so good is the hops in the beer, the organic material.

ASSEMBLYMAN BASSANO: It grows my grass real well.

MR. DOOLING: Sludge itself is not a fertilizer. It is a soil conditioner.

SENATOR PARKER: Wait a minute. How do you get the toxic metals out of that?

MR. DOOLING: They are in there.

SENATOR PARKER: Well, why can't we do that with ours, then?

MR. DOOLING: The metals are in there.

SENATOR PARKER: Why can't we then do the same thing, recycle it so we can use it?

MR. DOOLING: As Dr. Swanson mentioned before, forty years ago the problem started. If you had started anew at that time, and you didn't have available to you this large ocean, through this solution to pollution dilution concept, you would have been forced into looking into another alternative for handling your solid waste. Milwaukee does not have the ability to put it into the ocean.

When we talk about 90% dumping off the coast of New Jersey, that is via vessel. The city of Boston pumps their sludge into the harbor, raw sludge. Miami pumps it out off the ocean. They take the sludge and pump it out through a different pipe. Los Angeles does the same thing.

When we talk about 90% of sludge dumping in the ocean, it is via vessel, and that is what the ocean dumping act really controlled. Sludge coming out the outfault pipe - which is practiced by many communities - is not controlled under this act.

So when you think we are the only community discharging sludge into the ocean, we are not. We are the only ones doing it by a vessel.

ASSEMBLYMAN BASSANO: Is it feasible for the State of New Jersey to get into the production of organite?

MR. DOOLING: Again, to do that, the capital costs for doing something like that would be the same as pyrolysis; you are talking about a minimum of \$800 million. Yes, it can be done if the monies are there.

ASSEMBLYMAN BASSANO: Do you know if there is a great enough market for this material?

MR. DOOLING: This is the problem that we face whenever we develop a material like that. That would have to be researched. There is a research program that EPA is doing right now, with the Interstate Sanitation Commission - a program down in Ocean County, being funded by EPA, looking for land-based alternatives to handling sludge.

ASSEMBLYMAN BASSANO: Just off the top of your head, do you know the difference in the cost between the present method of disposal that is being used by, let's say, Linden and Roselle versus a plant which would manufacture organite?

MR. DOOLING: Their costs are probably up to \$15 to \$20 a ton.

ASSEMBLYMAN BASSANO: It would go up that much more?

MR. DOOLING: Yes. I think they are significantly higher than ocean dumping. Dr. Paulson in his paper, I think, is indicating that to go to pyrolysis, or any other land-based treatment system, it does involve a penalty in terms of costs. It involves the benefit, in our opinion, in terms of the ocean, but you still may be creating an environmental problem on land that at this particular point in time may resurrect itself at some later date.

ASSEMBLYMAN BASSANO: Including pyrolysis?

MR. DOOLING: Pyrolysis is more costly at this particular point in time.

ASSEMBLYMAN BASSANO: Would you still have a problem on land, in your opinion?

MR. DOOLING: Sure, because you are not--- First of all, pyrolysis doesn't solve all the problems. It is a mechanism for handling the waste. If there was a mechanism for handling the solid waste with sewage sludge, you could solve two problems simultaneously. Handling sludge by itself still results in the heavy metals being in the ash. The work that was just done in Japan showed that, depending upon the temperature of the pyrolysis unit, you will get cadmium or mercury or both in the atmosphere from any type of pyrolysis system. That was done on a laboratory scale.

We still at this time do not have a full scale sludge pyrolysis unit that we can say will work. It is a scale-up system from a small system, and when you scale up you have other operational problems.

SENATOR RUSSO: It sounds like the bottom line of what you are saying is, there is no alternative to what we are doing.

MR. DOOLING: Within the next year or two, I would say that would be the case.

SENATOR RUSSO: But you feel there will be an alternative after a year or two?

MR. DOOLING: With sufficient legislative pressure. The statement was made before, do we really have to burn their feet, and I think at times you may have to.

Because at the present time every individual group, and everybody else says, well, we can't do it unless somebody gives us the money to do it, or, there is no other alternative at this particular time.

They are all very valid factors. When there is a legislative mandate - it is just like a goal of 1981 being set; goals soon become mandates. Having a mandate is a stronger position than a goal, and when you have a goal, there is a tendency to slip it by. Now, moving out to the 106 mile site, as soon as that was mentioned, the first question that came up was, who is going to get the money? There were bills presented before Congress for the federal government to supply the additional funds for the communities to go out to 106. So there is no penalty, really, on a company if you considered sending somebody out there as a penalty, or as an incentive to force them into looking into alternatives, if the federal government is going to turn around and provide the monies to them.

SENATOR RUSSO: Then let the federal government look for the alternatives.

MR. DOOLING: The federal government right now is looking into alternatives. They are sponsoring a program here in Ocean County, which was started three years ago. Again, we have the problems of the ground water contamination with the nitrates. We have the viral problem.

The work that we are sponsoring with the IFC is looking at pyrolysis, but you recognize that whenever you are going to do this, the scale up time and design time involves at least two to three to four years.

ASSEMBLYMAN BASSANO: Then it would appear that despite the fact legislation was passed which set up regional solid waste districts, before those solid waste districts go into operation, they should also take into consideration liquid waste problems, rather than have them build their facilities and then at a later date find that they are going to have to change that facility around considerably because of the problem of liquid waste. I would think that possible legislation like the bill introduced by Assemblyman Van Wagner, possibly modified, may be the answer, telling the regional districts, the solid waste districts, that they should also take into consideration the problems of liquid waste, because in the very near future the State is going to mandate that that also be handled by their district.

MR. DOOLING: It depends on whether it is a "dump" or a sanitary landfill properly monitored and properly controlled. In the paper in the past week, you just saw a perfect case of the ocean backing up, and material winding up on a pier.

Landfills have been closed. They don't want liquid waste in there, because it leaves toxic industrial wastes in the ocean, which we have talked about. The point is that you have small scavengers that are taking these materials. We have just seen the tip of the iceberg. To just say that we are going to put in a landfill and more or less have this material absorbent--- It will leach out under anorobic conditions.

ASSEMBLYMAN BASSANO: The point that I am trying to make is that when you get up to northern New Jersey where we are limited in the amount of land that is available, Middlesex, Union, Bergen, Essex county area, these counties are going to have to be rather unique. They are going to have to come up with pyrolysis or another form of getting rid of their solid wastes besides landfill, because the land is limited.

MR. DOOLING: That is correct.

ASSEMBLYMAN BASSANO: If they are going to consider another form, they should also take into consideration that in the very near future they are going to have to handle their liquid waste problems too, because we are not going to allow them to dump offshore. And maybe that is where the Van Wagner bill comes into play.

If we were to get the message across loud and clear to those regional districts that this is coming, whether it be through the passage of legislation on a specific date, or any other way, for that matter, they should be made aware of that fact.

MR. DOOLING: Sludge is a solid waste, when it is de-watered. So the thing is, it can be handled under those mechanisms.

ASSEMBLYMAN BASSANO: So possibly passing this legislation as of a certain date, by saying that the State of New Jersey will not allow dumping off shore, and passing that information on to the regional districts and letting them know that they have to handle this problem as of that date---

MR. DOOLING: Again, it goes back to how many landfills or disposal sites in New Jersey at this particular point in time - I think Dr. Paulson can address this - can handle these types of wastes, and I don't think there are many. And they can't handle that volume. So at this particular point in time, until you develop the alternatives, in my opinion, we have removed 90% of the industrial discharges that were previously dumped in the ocean. They have found alternatives. Whether they have really found suitable environmental alternatives is somewhat questionable, because you don't know what they are doing with their wastes that they were previously dumping in the ocean.

ASSEMBLYMAN BASSANO: You see, man himself is rather unique in that if he is put under pressure--For instance, when we decided that within ten years we would land a man on the moon, we went out and accomplished that. If he is under pressure, I sincerely believe that he will find viable alternatives. There is nothing from precluding those particular districts from coming back to the legislature and changing the dates at a later time. If they know they are not going to be able to use the landfill operations that are available now because of the sanitary problems involved, they are going to have to start planning for the future. I think that maybe the legislature ought to take action to enforce that planning. That is the point that I am trying to make.

MR. DOOLING: But I think it must be planned on a bi-state basis, because we do take refuse from New York, and it must be handled on a bi-state basis.

ASSEMBLYMAN BASSANO: What you are saying in effect is, it would be more difficult unless the federal government were to step in and try to solve this problem. Number one, if the two states were to get together and try and work out their differences --- The problem is that most of the sludge that is being dumped off the Jersey coast, a good percentage of it, comes from New York, and I don't think they are affected as greatly as we are here - at least psychologically they are not as affected as we are here - with the idea of dumping raw sewage into the Hudson River. I think it affects New Jersey more than it affects the people in New York, and we just don't know if we are going to get that type of cooperation. I would hope that would be the case, but no one can say at this point. To look to the federal government, if you know anything about government, which I am sure you do, you know that the higher up you go, the slower it moves.

It is bad enough that the state government of New Jersey moves as slow as it does, without the federal government acting in this area. So for that reason, I am still of the opinion that we should do what we can here in New Jersey - and at the same time try to look to New York - and try to solve our own problems first.

MR. DOOLING: I would like to re-stress that the primary agency for control of pollution within the state is the state agency and not the federal government. The federal government more or less provides the monies and the activities, so the state agency, rightfully so, can carry on its activities and its programs where necessary.

In the case of ocean dumping, if the state agency can come into us tomorrow when we hold our hearing and say they object to the issuance of an ocean dumping permit to a particular town because they feel they have a viable alternative, we will not issue that permit. The state must certify to us all the permits that we issue for ocean dumping at the twelve mile site. Now, if our decisions are causing contravention of standards in the twelve mile zone, we have the responsibility of removing that volume of waste that is causing that problem.

Now, what I am indicating to you is we recognize there is a problem, a serious problem. To take the legislative and the administrative mandate literally, we can do it, but are we really doing the right thing for the overall protection of the environment? I think the general opinion, even of the members of your group here today, is, no, do not move it at this time, because we may be creating a more severe problem.

SENATOR RUSSO: Thank you, Mr. Dooling. While we are waiting for Dr. Paulson to come forward, we have a termination hour of three-thirty scheduled, and the only thing I can suggest is hopefully we can move along. If not, we will have to schedule another hearing. If you have a statement that you would like to submit, we would be glad to enter it on the record.

Everybody, though, who wants to testify will be given the opportunity, even if we do have to have another hearing.

D R. G L E N N P A U L S O N: Chairman Russo, Members of the Legislature, ladies and gentlemen. My name is Glenn Paulson; I am the Assistant Commissioner for Science in the New Jersey Department of Environmental Protection. I have with me on my left Dr. Marwan Sadat, head of DEP's Office of Sludge Management and Industrial Pre-Treatment, and immediately behind me is Edith Casey, a member of my staff.

We are here today in response to an invitation from the Senate and Assembly Committees to Commissioner Bardin to present DEP's testimony on solutions to the problems of ocean pollution. We welcome the continued interest of members of the legislature in the problems of pollution of the ocean off New Jersey and the rivers and the bays that empty into it. Your Committees, both through hearings and through distribution of reports prepared for your use by our Department, have done much to inform not only the Legislature but the public at large.

I have a prepared statement, which I believe Mr. Mattek has distributed to the Committee already, and in the interest of time and the long witness list, I would like to go through that briefly and highlight some points in it, which I think are either important to the issues discussed earlier today, or which would give our view on specific pieces of legislation before you.

For the members of the audience, we do have some extra copies of the full text, which you can get from Ms. Casey immediately after my presentation.

Solutions for the complex problems related to pollution of the ocean must be reviewed with an understanding of legal restraints and potential economic and social effects, both positive and negative, as well as current uncertainties and scientific information and engineering skills. I would like to discuss briefly several issues related to this.

First, the issue of federal pre-emption. Several courts have ruled that state jurisdiction over a wide variety of activities conducted in the ocean ends at the three-mile limit, and beyond the three-mile limit, the federal role is paramount. For ocean dumping in particular, Congress adopted extremely strong pre-emptive language in the federal Marine Protection Research and Sanctuaries Act of 1972, the Ocean Dumping Law which had been mentioned earlier.

Both the Attorney General's Office and DEP lawyers have advised me that this is very strong pre-emptive language, and may effectively preclude the state from any direct regulatory role not only on activities conducted beyond a three-mile limit, but possibly for activities within the three-mile limit as well. This is not to say that the State has no role whatsoever. Within the three-mile limit state authority over actual dumping from vessel might well be paramount; however, as a practical matter, we are not aware of any regular dumping of sludge or any other material from vessels within the three-mile limit.

Arguably, on-land activities needed in the total waste disposal process could be regulated by the state, such as loading of vessels - as is proposed in some of the legislation before you. However, based on our legal analysis, at this time, the possibility or feasibility of state regulation of on-land activities deserves a very thorough legal review prior to any formal action to avoid any wasted or duplicate effort, or effort that would raise false hopes, for example, by any state legislative or executive agency.

The next issue I wished to discuss was the role of other states as sources of material dumped in the ocean, and as needing action in other states as well as in New Jersey to remove problems. I think that has been discussed adequately here already.

The third issue I would like to discuss is the cost of ending ocean dumping. Costs will, without question, be involved, because I think without exception the current materials that are disposed of in the ocean off New Jersey are disposed of there because it is cheaper than anything else. The costs would be borne both by the public sector and the private sector. The public costs for alternatives for sludge, for example, have been analyzed in DEP's January report on the ocean dumping of sludge, which you have previously received for your convenience, a copy of which is appended to my prepared remarks, and we would be glad to go over those costs. I think the figures mentioned earlier are generally in the ball park with ours.

None of these costs are trivial. Even moving to the proposed 106 mile site for sludge would result in roughly a four to five-fold cost increase per ton of sludge disposed. Moving to composting of sludge on land would cost roughly the same amount of increase, perhaps slightly less, than a distant dump site, and pyrolysis is several fold higher than that.

Under current practices, part of the costs to sewerage authorities of any land-based alternatives would be paid for by federal and state grants, which would therefore reduce the direct cost to the sewerage authority and its direct

customers, by shifting the cost, in effect, to the federal taxpayer. In contrast, virtually all the costs of ocean dumping are borne directly and totally by the sewerage authority and its customers.

Industrial wastes dumped into the ocean are also being reduced by EPA's activities under the Ocean Dumping Law, which Mr. Dooling referred to briefly. Other people have mentioned the cost potential there.

S-1808 which calls for a \$100 million bond issue recognizes that funds will be needed to construct alternative sludge disposal facilities. However, as just pointed out above, alternative sludge handling techniques will be eligible for federal funding for 75% of their capital costs, not operating costs. Presently, work is underway which would allow an estimate of what will be the total costs - and thus the federal on the one hand and the state local shares on the other - for various sludge handling alternatives for sewerage treatment authorities and facilities throughout the state. Thus, while we welcome your recognition that funds will be necessary to implement alternatives, we recommend that you hold this idea in abeyance until more definitive judgements on dollar figures can be made within several months.

S-1804 would also provide funding for the development of alternative methods to replace ocean dumping. This is the bill that calls for an increase in fee schedules of \$1 per cubic yard the first year and another dollar each year thereafter. Since the estimated cost of ocean dumping of sludge in 1978 is about \$1.45 per cubic yard, another \$1 a cubic yard is indeed a healthy economic incentive. The sludge produced in northern New Jersey in 1975, if so taxed, would produce \$2.1 million the first year and \$4.2 million the second, and \$6.3 million the third, and so on. If implemented, these monies might allow a somewhat more rapid shift to composting or other on-land alternatives.

The next issue I would like to generally discuss is the need for flexibility. I think the remarks here today have clearly shown that just looking at the limited technical issues of distance per transportation of sludge of the heavy metal composition of various sludges which will vary from place to place from time to time, shows that the set of tools, timetables, and solutions that are eventually agreed upon must contain flexibility.

The next point I would like to make, which I think is a very important one, perhaps the most important one, is that in our view landfills as of this day may be generally unsuitable for sludge disposal in New Jersey. Both S-1659 and A-2320 propose to completely end the ocean dumping of sludge in very short periods of time. While we applaud the goal, we believe both of these pieces of legislation are unworkable as they now stand. First, as the issue of federal pre-emption; second, the only quick alternative, as both bills recognize, is the use of landfills. We believe this technique is highly undesirable. Sludge can contain toxic heavy metals - as has been noted - harmful bacteria and viruses and other hazardous agents, such as cancer causing agents, as well as high levels of organic matter. All of these can badly pollute both ground and surface waters. The disposal of sludge in unsealed landfills, unfortunately typical for the existing landfills of New Jersey, would pose a direct threat to human health, to the quality of our ground waters, and to aquatic life in our streams, rivers, and bays. Although A-2320 calls for continued monitoring of landfills accepting sewage sludge, monitoring does not prevent contamination, and that is an important principle to keep in mind.

The next issue I would like to discuss is regionalization of sludge management. A common threat in three of the bills to regionalize sludge management is in complete accord with our thinking. In fact, under our urging, all the sewerage authorities in Warren County and also the municipalities of Trenton - Hamilton, Ewing and Lawrence-have recently agreed to undertake analyses of alternate sludge handling techniques that would be suitable for these two regions.

DEP policy is to mandate regionalization of sludge management as an integral part of the planning and construction of all new sewage treatment facilities in the State. Bill A-2357 calls for the regionalization to be done through integration with the solid waste planning and management process provided for in S-624. While we are implementing the concept of regionalization, we do not believe that sludge management should be tied to the county oriented planning mechanism in the solid waste act. I discussed this informally with Assemblyman Van Wagner before he left.

Sludge generation does not follow county lines, but rather sewer lines, and more generally, population distribution. The ongoing work by DEP and the state's sewerage authorities should provide later this year the information needed for defining regionalization system, which might in some areas coincide with county lines, but my prediction is far less often than that will it coincide with county lines, or even with existing political jurisdictions - municipalities, for example.

The next issue is pretreatment. We welcome your recognition of the importance of establishing industrial pretreatment requirements. This is a rapidly developing area, and in the interest of time, I think we would offer to cover recent developments in a question period, rather than discussing them now.

The next issue I would like to discuss is lessons from the fish kill. I sympathize with Senator Parker's frustration on hearing different views on the causes of the fish kill and on the steps to take care of them. Let me state DEP's view. We recognize the role of the physical factors in last summer's unprecedented event, the lack of storms, etcetera. In fact, we have been praying for a stormy spring this year. We have not gotten those storms yet, unfortunately. But we also believe that the basic over-fertilization in the ocean was an equally significant cause, and while we can't do anything about the weather yet - or very quickly, as Mark Twain has noted - we can do something about the over-enrichment, not overnight, but over the years.

To our mind, each source of enrichment, whether it is the inorganic fertilizers or the organic loading, is fair game for attention and essential attack, and a decision, then, is not what to do, but which piece of it you can get a hold of and do something about more rapidly. We believe that of the several sources of the over-enrichment of the ocean, the sludge is the one that is the most amenable to a fairly rapid solution - although rapid in this case means over years, not days, weeks or months.

SENATOR PARKER: Can I interrupt you at this point?

DR. PAULSON: Certainly, Senator.

SENATOR PARKER: I think that it is essential that we attack each of them and I know some of them, or maybe none of them, are within our jurisdiction. I just said to John that it appears that we are going to have to make a "political decision" to do this, and the environmental and scientific community will have to follow it whether it is 100% right or 100% wrong. And if we do stop the sludge dumping, we can do that, but we have to provide an alternate source, and I don't know that landfill is the alternate source, and I am trying to stay away from that.

Can we realistically do that, number one? Can we do it now within a year, implement one of our laws? Can we do that? Can we have your support to do that, the Committee?

DR. PAULSON: It is simply not feasible as a matter of engineering practicality, timetables and the like, even if the money were sitting in front of us in a big pile, to phase out all of New Jersey sludge in a year. We hope in this year to start chipping away at it. The Camden composting project, for example---

SENATOR PARKER: Right, I am familiar with that.

DR. PAULSON: --- which will be implemented later this calendar year, will reduce 50,000 tons of sludge per year from going into the ocean. In that case it is the ocean off the coast of Maryland and Delaware, rather than the ocean off New Jersey.

SENATOR PARKER: But can't we go into pyrolysis of some kind?

DR. PAULSON: Pyrolysis would take even longer. One of the reasons that we are in favor of composting is that the capital equipment required is rather small. You need a couple of bulldozers, backhoes, spreaders and the like, so that you can get the equipment quickly. You can buy it quickly if you have the money.

Secondly, there is no de-bugging time involved, as there would be in the scale up, for example, for a large pyrolysis unit that would handle sludge, from, say, the Passaic Valley Sewerage Commission, or the Bergen County Authority. Those are untested technologies at that scale. Composting has been tested---

SENATOR PARKER: Well they do have them in operation, do they not?

DR. PAULSON: They are small, and putting aside the air pollution implications, for example, which are also very serious, because the sludge is produced where there is a lot of people, and there is a lot of badly contaminated air already, although we are making improvements, and you would have to think more carefully about putting in a new source of particulate matter, say, in Hudson, Union, Bergen, and Essex Counties, which is where the sludge is rather than in, for example, Atlantic or Cape May, Burlington or Camden --- I shouldn't say Camden --- or Salem.

So, a year is simply too short a period of time, even if the money were at hand, but I think we can expect --- Our goal in DEP is to move to composting, not on a demonstration scale, but on a real world scale, taking care of all the sludge from sewer authorities as quickly as we can. We believe in all conscience that with adequate funding, support, from the Federal EPA where 75% of the capital costs will be borne by the taxpayer, with the state and local funds being made available in a timely manner, and of course, the state bond issue, the state will be able to carry out its share of the load. With the commitment of the sewerage authorities, who are understandably reluctant to raise costs to their customers, as I am sure many of you have heard from sewerage commissioners in your regions, but with their interest and commitment, we believe that we can move New Jersey Sewerage Authorities out of the ocean to a substantial degree starting this calendar year and increasing in the next several years.

SENATOR PARKER: Now, let's go into each of the areas. What effort, if any, has been made to bring all water quality standards in New Jersey to an area whereby we can at least try to prevent runoffs which are detrimental? As I understand, that is roughly 20% of the problem. Is there anything? I know you promulgated pinelands rules, which everybody says they can't live with - everybody I have

talked to. Do we have to do that throughout the state to get the agricultural runoffs and other things out of the ocean?

DR. PAULSON: Let me preface my answer with one observation. Science and scientific knowledge is an evolving and advancing field. We think differently about the pollution of the ocean this month than we did a year ago this month before anybody had widely reported the ceratium bloom, and in that case many weeks before the divers first spotted the dead wrecks off Monmouth County. So I think you have to recognize an evolving set of knowledge that can provide the basis for reasonable and responsive action. At the same time, of course, the political demand for action is, if anything, outstripping the scientific knowledge, a development which I as a scientist welcome. It will help redirect the efforts of scientists into ways that may provide answers more quickly than would otherwise be the case. So I don't have any problems with the human cry and with the burning feet; I have a pair of those too.

As a matter of scientific judgement now, I have already told you our first judgement which is that the piece of the offshore overenrichment that we think is the most amenable to attack in terms of feasibility in an engineering sense in terms of its contribution both to degradation of the existing site, and to the enrichment more generally, is the sludge. We are not at this moment, and my testimony mentions this, recommending heroic measures for any of the other sources. If there were responsible measures that we could now recommend, for example, on dredge spoil, where we could see the light at the end of the tunnel the way we believe we do for composting and sludge, we would certainly recommend those, and we would not be shy in recommending what the dollar costs would be. If we felt certain that throwing out the programs to remove the raw sewage from New Jersey's up water streams, rivers, and bays was value-less and that something else should be done instead, going to tertiary treatment right away, for example, on balance, we would make that recommendation.

I explicitly noted in my testimony that we are not, as a matter of our professional judgement, able to offer you that advice today. We see that as an issue for the future, however, because, in part, of the offshore fishkill. The dredge spoil problem, possible advanced waste treatment for New Jersey sewage, I will be very happy when our Department can report to you that all the sewage in the State runs through a good modern secondary sewerage treatment system, and doesn't run through a primary system or raw into the surface waters of the state with the bacterial threat it poses to humans directly through shell fish with the threat it poses to aquatic life through suffocation in inshore waters, analogous in the offshore waters, and so on; we are a long way from that day.

In that area, we have to walk before we can run. The other potential sources, atmospheric fallout, agricultural runoff and so on, it is only within the last year or two that a very rough estimate as to their contribution can even be made, let alone any constructive thinking to limit their contribution if that becomes justified. One of the elements in our judgement is cost. Even if you just speculate on the cost of doing something with any of the other waste discharges besides the sludge, you are in dollar figures many, many times that which we have estimated for either moving the existing sludge disposal site to the 106-mile site, or toward composting. For example, the problem of storm water runoff, and

the loading of organic and inorganic contaminants that that places in the inland waterways, the bays and the ocean after a heavy rain to cure in New Jersey would cost \$8 billion. That is many score higher, even then to go to composting or pyrolysis for the sludge. Maybe we will have to face that \$8 billion expenditure down the road.

SENATOR PARKER: What would you use that money for, to dike and dam in holding ponds, or what?

DR. PAULSON: Basically, yes. Heavy construction which would hold the waste waters until after the rainfall, so that they could be run to the existing treatment systems. Such questions as agricultural runoff, I couldn't even put a dollar figure on at this point.

SENATOR PARKER: Well, what can you do in agricultural runoff at all, dikes. ---

DR. PAULSON: The phenomena is so poorly understood that I don't think I even want to mention any possibilities. The non-point source pollution assessment program that was established under federal law in 1972, the first time that the federal government decided to look at the water pollution impact in mining, forestry, agriculture and the like, has not yet yielded any results that will allow sound speculation as to solutions. When the problem is defined, as it is starting to be in this state and others, then I think the creativity directed towards solutions can begin to work. At the moment, I think it is a bit premature. There may be, for example, times or rates of fertilizer application that could be changed in areas where the need could be shown. There may be alternate kinds of fertilizers that would be used, for instance. There could be physical intervention, such as dikes or recycling of irrigation water, for instance.

At the moment, costs, effectiveness, are a complete mystery. That mystery will be pierced starting later this year and next year in this state as the results of those analyses by watershed start coming in. But it is a very uncertain area, one in which I think the trials and errors of analysis will take some years, not just months. The first time around is not going to provide the solution.

SENATOR PARKER: Let me ask one other question on dredge spoils; is that the only basis for dredging, to keep the waterways open for shipping?

DR. PAULSON: That is correct. That is obviously a necessary social need.

SENATOR PARKER: I understand that. I was just thinking, if that is the only need, maybe we ought to again look - especially with offshore drilling coming - at a deep water monitoring system, to keep some of those deep dredge vessels out of our inland waterways, and maybe we wouldn't have to dredge so much.

DR. PAULSON: But the dredging is needed even for the smaller tankers, and in some channels, as I am sure you are quite familiar, even for pleasure craft. Let me not say anymore about sludge.

MR. MATTEK: With respect to dredge spoils, don't we pretty much have a national record of disposing of dredge spoils in confined sites on land now?

SENATOR PARKER: Well, you have hopper dredges that work and dump them off shore.

DR. PAULSON: It is mixed.

MR. MATTEK: I mean the technology of dealing with this problem is a fairly simple one that we are using throughout the country, and that is, just putting it into confined sites on land. Would you care to comment as to why we should or shouldn't.

DR. PAULSON: I will defer to Dr. Sadat for details, but just as there are sludges and sludges - Camden's is different from Jersey City's, for example when you get down to the detail of what is reasonable to do with it - so there are dredge spoils and dredge spoils. Dredge spoils from a pristine area that can be considered basically sandy muck without substantial heavy metal contamination for instance, you can think about alternatives for diking near areas of direction and contact through eating fish, for example, in a substantially broader way than dredge spoils, for example, from the Hudson River, which are sandy muck, well laced with a variety of heavy metals and other contaminants, and there the placement where they could result in direct or indirect contact to humans becomes a much more difficult problem. Let me just point out, while I don't have the figures nationally on what is done with dredge spoils, how much is put in on-land locations, how much is dumped off shore, and I don't have the exact figures for the New York Harbor area, my sense is the great bulk of the dredging in that area does go off shore, and very little goes to on-land disposal.

The quantity, as has been pointed out earlier today, is immense just for that region. In 1975, 13,600,000 cubic yards of dredge spoils were dumped at various locations in the North Atlantic Region. About 640,000 cubic yards of that came from New Jersey waterways. The possibility of finding alternatives for dredge spoils, other than just dumping them in the ocean or in a dike some place, has only recently gotten attention. The Corps of Engineers, which is by far the major generator of dredge spoils, has begun a \$30 million research program to evaluate the impact of dredging and of disposal of dredging materials, and to develop technically feasible and environmentally and economically acceptable alternatives. Unfortunately this five year program was started only two years ago, and the reports to date don't give very much useful guidance.

For this reason, I doubt if we can come to you before that Corps of Engineers' program is over and give you something like a broad-brush approach to what should be done with dredge spoils. The doing of something different with dredge spoils, under current federal law - and I don't envision that being changed - will predominantly be the responsibility of the federal government now lodged virtually solely with the Corps of Engineers. EPA has a little bit of a hand, but not much.

MR. MATTEK: That doesn't prevent you or us from trying to encourage them to take steps that we feel would be proper.

DR. PAULSON: It certainly doesn't. In commenting on possible dredge spoil disposal sites in New Jersey, which come before my part of the Department quite frequently, there is a lot of channel dredging that goes on. We try to find the least damaging locations for these materials to be placed, but the least damaging location is hardly ever a location where there is no damage at all. And the tools that you basically have for dredge spoil are here or there, both of them being in the water, or in a wetland or very close to a wetland. But at least when you talk about sludge you can discuss reasonably composting, pyrolysis, incineration, land application, et cetera, and you know the parameters you are working in.

For dredge spoils you have no where near that array of even definable tools at your disposal yet.

SENATOR PARKER: Up and down the coast, though, in all your inland waterways, they create artificial islands everywhere else.

DR. PAULSON: That is correct.

MR. MATTEK: In response to the question from Senator Mc Gahn, Commander Swanson from NOAA said that an artificial island solution might possibly provide a solution for the next twenty years, as though that were an insignificant time period. It seems to me like a twenty-year solution would be a major step forward.

SENATOR PARKER: Because even if you did it for twenty years and then started to dump some off shore, you know---

DR. PAULSON: Well, for dredge materials from the channels between New Jersey's bays and the ocean for the intercoastal waterway, the deposit locally to create new artificial islands or quasi-wetlands is very reasonable. The dredge spoil is not contaminated against background levels, whatever those may be, from place to place. The material on the bottom is very close to what is now upland and moving it around seems to work quite effectively. You could not say that for dredge spoils dredged from the Raritan River, for example, or the Passaic, or the Hudson. The chemical appearance to the eye and the odor will tell you those are substantially different materials and you would be less enthusiastic about creating undiked, artificial islands in the proximity of dense human habitation from those dredge spoils.

SENATOR PARKER: It is amazing to me, quite frankly, that dredge spoil is such a major problem as was shown. I had originally understood from your figures that it was only 20% of the problem. Now, it appears that it is a lot more of a problem than I had originally understood it to be last year.

DR. PAULSON: Well, it depends on the pollutant you look at.

SENATOR PARKER: Yes. I am just trying to think, the "dredge" that we now have as opposed to --- They have stopped all dredging in the Delaware, Liberty Dredge Company, American, and all the others have been prohibited from dredging and processing because of environmental reasons, and maybe I don't understand all those, and yet if I recall, there are only like two hopper dredges on the whole coast of the Philadelphia area. One was down in Atlantic City two or three years ago, and they use that up and down the island. Where is all this dredge spoil coming from? Where physically are they getting it?

DR. PAULSON: I would defer to the spokesman from the Corps who might be able to give you that information today or give you a breakdown. By having them around the New York Harbor in the New Jersey area a lot, having seen, for example, the figures on the start of the clean-up project which would be removing timbers and whatnot, as well as some material next to Liberty Park, my hunch is the great bulk of it generated in New Jersey - or let's say New Jersey plus that area of New York State next to New Jersey - is probably from the major shipping channels of north Jersey---

SENATOR PARKER: That is what amazes me even more with the Army Corps of Engineers, because it has been my experience - let me put it that way - that where you have constant ship or boat traffic, you will create your own channel, and you don't have to have a lot of dredging except where you have abnormal situations. I am just trying to think in my experience when I have seen any of these dredges operating, and where, and what is being taken. Again, it is kind of like the algae bloom, it has never been here, but now it is here, and the dredging, I find it hard to believe that it is so substantial and that it would continue to be so substantial, assuming we didn't take any dredge spoil.

DR. PAULSON: Well, my subjective impression of the New York Harbor area, which I go over once in a while by air, is that you can usually see a dredging vessel, if you bother to look, somewhere in one of the major waterways.

SENATOR PARKER: A dredging vessel, or do you mean a barge?

DR. PAULSON: Yes, there is something with a pipe up on the surface pumping in to some location, some upland location. It doesn't strike me as an unusual thing to see at all, in my observations of the river system, on the major shipping channels of northern New Jersey and New York. Now, I am not that familiar with the Delaware, and I am not that familiar with the bays---

SENATOR PARKER: I know that they have stopped all dredging for commercial purposes in the sand, and I wonder why we would permit the other dredging if it is so bad? Why can't they reprocess that dredge spoil as they do all other sand and aggregate?

SENATOR MC GAHN: Doctor, why don't you just comment in general, and then we can question you more thoroughly at a later time.

DR. PAULSON: I will just close by saying that DEP welcomes your continued interest in the critical issue of contamination of the oceans. We look forward to working with you to forge effective solutions that will benefit the ecological health of the ocean and its creatures and thus benefit those whose livelihood and recreation depends on the healthy marine ecosystems.

SENATOR MC GAHN: Senator Parker, any other questions? Again, I would assume that you could summarize the situation as being like the little boy at camp writing home, "Dear Mom and Dad, having a fine time, send more money."

DR. PAULSON: The money would certainly help, especially on the sludge disposal part. As I say, there are tools defined in some cases, tested at small scale levels - and in the case of composting tested really for the population of about two million people, and there, we are very optimistic. We have some few residual questions, but that is the route we have chosen to go. I should mention another possibility that has been brought to my attention, the idea of combining sludge with solid waste. We are working jointly with EPA on trying to implement a joint composting of sludge and solid waste in a city which has a particularly bad sludge, a very heavy metal laden sludge. There is the possibility that joint composting of garbage and sludge may help tie up the heavy metals in a chemical matrix, so that the leaching potential might be reduced drastically below that of composted sludge alone. Now, that is a hope for which we have some bench-scale data, but it is not a certainty yet. We want to move now to a full scale project with a sizeable demonstration project within the next several months to test that out.

If that technique works, as well as early indications lead us to hope, then the applicability of composting for sludge will be widely extended, and in particular other urban areas like New York City, whose sludges are laden with heavy metals, will not be able to raise that as readily as a technical reason to move in that direction. We have other possibilities in the works which we can discuss in more detail, but that one in particular is one that we are very interested in finding the answer to, and we hope the answer is one that will lead us to move down that path more rapidly.

SENATOR PARKER: If we get to that point, suppose we can compost it or do it through pyrolysis and get it down to where we just have the cinder or the toxic metal, I assume that will be substantially less volume of bulk than anywhere near what we are doing now.

DR. PAULSON: Yes.

SENATOR PARKER: At that point, if it is mainly just ash and the metals, would there be any harm in dumping that off shore? I know a lot of metal wastes and chemical wastes really do not "contribute" to the problem of the oxygenation of water and the overenrichment and the problem on the coastal level, unless you have some natural deposits off shore like Kepone or something like that.

DR. PAULSON: Let me ask Dr. Sadat.

DR. MARWAN SADAT: Senator, one of the problems with pyrolysis - and there is an installation in New Jersey right now. It is a pilot plant study which is being conducted by Nichols Engineering in Belle Mead in Somerset County- as far as our indications are, unfortunately, is that most of the heavy metals are toxic heavy metals, such as mercury, cadmium, lead, go up the stack into the atmosphere, and they volatilize at fairly low temperatures. Now, for pyrolysis to operate properly, it should operate at about 1400 degrees Fahrenheit. When you go up to 1400 degrees Fahrenheit, most of these heavy metals, which are toxic - especially cadmium - end up in the atmosphere, and in fact, there have been a number of brand new installations in the United States which have been shut down because of heavy metal getting into the surrounding area of the incinerator and creating problems with lead poisoning, mercury poisoning and cadmium poisoning.

The problem is really quite complicated. We really don't know enough about it at this point---

SENATOR PARKER: Is there any way to eventually take those out through some kind of scrubbing process in the stack?

DR. SADAT: The scrubbing process will remove the particulates. You can go through an electrostatic precipitator to remove the oily residues. However, the heavy metals volatilize and go right out. Now, the way to prevent that is to have an effective industrial pre-treatment program where you attack it at the source.

SENATOR PARKER: Well, what is the source of cadmium? What do we use cadmium for?

DR. SADAT: Cadmium is used for batteries, electro-planing.

MR. MATTEK: To use sludge for fertilizer, would it be necessary in all cases to have pre-treatment programs by industries to take out the heavy metals?

DR. SADAT: It depends on where you are going to put it. If you are going to put it on agricultural land and it may enter the food chain, you certainly want to be very careful about the kind of compost or sludge you apply on the land. If you are going to use it in reclamation projects, it may not be as critical, however, we must still make sure it does not end up in either ground waters or surface waters.

We think we can solve some of these problems with coal disposal and coal composting of sludge and refuse. That would allow us to tie some of these metals, or at least dilute them enough so they would not become a problem.

DR. PAULSON: Senator Parker, just one comment. To make it very concrete, the compost that will be produced in the first major state project in Camden will be recommended for use as a soil conditioner, not in gardens, not in agricultural fields, but on golf courses, or perhaps adding it to the topsoil over dumps, recreational lands, reclamation projects and the like. It is because of that uncertainty about heavy metals getting into vegetation that we will not allow that compost to be used in ways that it might expose people to foodstuffs grown on it.

That is the level of firmness in our mind based on our current knowledge.

SENATOR PARKER: It looks like we are going to have to put up with the atomic wastes.

SENATOR RUSSO: Are there any further questions? Thank you, Dr. Paulson. Our next witness is Mr. Bill Behren.

B I L L B E H R E N: Thank you, Mr. Chairman, my name is Bill Behren. I am appearing here today on behalf of the League for Conservation Legislation and in place of Derrickson Bennett of the American Littoral Society.

Basically, the League for Conservation Legislation and the American Littoral Society both strongly applaud the two committees for their interest and willingness to move ahead very quickly on this sludge dumping matter. We absolutely agree with the sentiments expressed today, that there is great need for legislative action to put the heat on, so to speak, to get something done. We are not satisfied that a guideline of ending dumping by 1981 is sufficient, and we strongly approve of the legislative attempts that are under consideration today.

However, we also are very familiar with legislative efforts which have gone through the legislative process and been passed and enacted into law, and then nothing comes about after they have been enacted. In the following comments I have specifically been looking at the bills under consideration. Please understand that we are supportive of the effort, but we want to make sure that the bills which come out of this discussion are in fact effective and will do something about the problem.

One of the terrific things about today's meeting is that there was a joint session between the Assembly and the Senate Committees, and since we are dealing with legislation from both houses, I would suggest that, if it is possible, you - I know it hasn't been done yet before in the New Jersey State Legislature - develop a joint bill from the four bills, combining the best points of each of them and have one complete piece of legislation that will tie everything in together.

As an example of the problem, you have Assemblyman Villane's bill and Assemblyman Van Wagner's bill which talk about having a ban on ocean dumping within a year or two years, and they also propose that alternative dumping methods be used. However, the funding mechanism is enclosed in Senator Russo's bill which is a Senate Bill, and perhaps some of that can be put together.

Certainly the lack of funds on the part of Assemblyman Van Wagner and Assemblyman Villane for the implementation of their bills is a serious problem, not just in terms of funding the alternative processes, which Senator Parker's bond issue hopefully would take care of, but in the implementation end of it, in the enforcement of it and all these other administrative problems associated with getting a new program like this started, there is a definite need for funds. We don't want to see another case of the Solid Waste Management Act, which was passed without funds, and now two years later, after it was passed, the bill is still not implemented because there is no money available. It is sheer legislative folly to go that route. If you are going to do this, we hope that you will provide the funds possibly through the fee mechanism that Senator Russo has suggested.

We are extremely concerned about the environmental impacts of the alternative methods of waste disposal. Assemblyman Villane, in his testimony earlier today, stated time and time again that there were environmentally suitable means of dealing

with the sludge problem, if we don't dump it. However, there has been contrary testimony. Also included in this bill there is a discussion of using existing landfills as alternative dump sites. We are highly dubious of any attempt to take the heavy metals and other contaminants, which are present in sewage sludge, which are posing a problem, to the ocean and transferring that and dumping it into our surface and ground water supplies where there will certainly be a much more immediate impact in terms of contamination of our drinking water supply.

We would suggest that whatever new committee bill or whatever form these bills are passed in that you put an absolute ban on any dumping of sewage sludge on land in a landfill which cannot deal with it, and which will result in leaching into the ground water or surface waters. This will probably involve giving the DEP money to test the sludge before it is dumped, to see exactly what is in it, and whether it is suitable for land dumping or not, and also money to monitor afterwards, as well as enforcement capability.

We would insist in both Assembly Bill 2357 and Assembly Bill 2320 that an environmental impact statement accompany any proposed alternative prior to its adoption, so that we know what the impacts will be before we shift, and we can make an assessment as to whether the impacts will be worse on land or in the oceans.

I think that pretty much covers the specific comments we have on the bills. If there are any questions, I will be glad to answer them. Once again, I would very strongly like to commend both the Committees for holding the hearing today and for indicating that they will move quickly on these matters.

SENATOR RUSSO: Thank you, Bill. Any questions? If not, thank you very kindly.

Mr. Snarski.

STANLEY SNARSKI: My name is Stanley Snarski, and I am from the Philadelphia District of the Corps of Engineers. I am here today at Senator Russo's invitation to discuss the effects of oil dredge disposal in the waters of New Jersey, particularly the ports of the Delaware River. I have noticed there have been some questions on national dredging problems and questions dealing with the New York Harbor, and perhaps after I finish a few brief remarks you might discuss any specific questions to the limit of my knowledge of them.

Philadelphia District basically is responsible for dredging in the Delaware River Basin which includes major ports in Philadelphia, Camden and Wilmington, and we are also responsible for some small projects along the shore, the New Jersey Intercoastal Waterway, which is primarily a recreational channel, and several inlets along the New Jersey Coast.

So far, as our annual contribution of dredge material, from our activities in the Delaware River and the Jersey shore area we have dredged approximately five to six million cubic yards per year. Most of this material is in maintaining the forty-foot channel in the Delaware River - I would say a minimum of 90% of it. All of this material---

SENATOR PARKER: Excuse me, how far down do you maintain it at forty-foot? I thought it was sixty-five when you go down further?

MR. SNARSKI: No, it is forty foot. The natural depths in the Delaware Bay below the Shelhansy River are deeper than forty feet. We don't dredge to that. So, basically, we have approximately five million yards of this which

comes from the Delaware River channels.

SENATOR PARKER: Five million of the six million?

MR. SNARSKI: Yes, it is about five and a half million total annually, and about five million of that comes from the Delaware River, the Christina River, which is in the Wilmington Harbor in Delaware.

Virtually all of this material is placed in enclosed upland disposal areas, dike areas. In the Delaware River, the only material that we dispose of overboard is some virtually clean sand in the Delaware Bay, and this occurs only once every four or five years. All of the material is disposed of and contained in upland areas.

SENATOR PARKER: What do you dump off shore, anything?

MR. SNARSKI: We dump only clean sand from Absecon Inlet from Manasquan Inlet, and Cold Spring Inlet.

SENATOR PARKER: Well, does that have nutrients or any adverse materials?

MR. SNARSKI: No, this is basically clean sand that is being recycled back into the system, and the littoral drift picks it up and puts it back on the beach. We do strive in all of our projects to maintain our posture of upland disposal in enclosed areas. There are problems---

SENATOR PARKER: This is all done along the coast, Loganb---

MR. SNARSKI: With the intercoastal waterways there is a more difficult problem in that there are environmental sensitivities of dumping in the ocean, as we have heard today, and there are similar environmental sensitivities to dumping in marsh areas and in areas along the intercoastal waterway. There are several locations where we do dump overboard, but the material is generally clean sand or non-pollutant materials.

SENATOR PARKER: Well, through Great Bay and along there you dump right down alongside the channel and create an artificial island. The only environmental impact on that is just, what, sand on top of the oysters?

MR. SNARSKI: You are virtually taking material from one place and putting it in another place.

SENATOR PARKER: Well, you do have some impact on the shell fish, right?

MR. SNARSKI: Well, the areas that are selected for overboard disposal are areas that do not have shell fish or are closed to shell fish. All the impacts are considered before we do dumpings.

SENATOR PARKER: So, if I understand you correctly, in Philadelphia you are dumping little or nothing overboard?

MR. SNARSKI: We may be dumping, perhaps, 200,000 cubic yards of sand per year.

SENATOR PARKER: That is from the natural inlets?

MR. SNARSKI: Right, fairly clean material.

SENATOR PARKER: Now, can you answer any questions about the New York district?

MR. SNARSKI: I have some knowledge of the New York district problem. Basically in Philadelphia we have these diked up land areas, and it is only because someone had some foresight about twenty-five or thirty years ago to provide these areas. If we wanted to fill these same areas today, we would not get environmental approvals for them, because they are either shallow water areas or marsh areas that have now been converted to upland sites.

In New York Harbor, the situation is a little bit different. They don't

have the land available that we had, along the Delaware before you get to Philadelphia. They do have marsh areas available which, of course, in today's environmental climate would not be acceptable for disposals.

New York, as I understand it, is a combined hopper dredging with bottom dump in the New York Bight area, and some barging of dredge spoils also for dumping off the New Jersey coast. As far as alternatives, I am not that familiar with the situation as far as just what land areas are available, or marsh areas would be available, if the decision - after weighing all the facts - was made that it was more valuable to use the marsh and protect the ocean.

SENATOR PARKER: Let me ask you a question. In Philadelphia, and in our area, I know you have the sight at Delanco, and I have seen it. You fill that in, and have a large, what appears to be, sandfill of some kind. Do you sell that off for various other fill projects such as highways, or various other things, so there is movement of that?

MR. SNARSKI: There is plenty of gradation of material. The project starts in the Delaware River up in Trenton, and works south. From Trenton to Philadelphia you have pretty good material. It is very sandy; it has a high value for resale, and in fact the disposal areas along that ridge are owned by the State of New Jersey, and the State does resell that material.

Starting with Philadelphia south, we have about another six to seven sites in New Jersey, and the material in that region is very silty. It doesn't have the quality you want granule material to have. It is very silty; it is not granular. And there is some sale of that material for use in highway embankments, covering landfills, and any area where you could use any type of common fill that doesn't specifically have to be granular.

I would say the amount of material that we sell per year, though, is minimal as compared to the loading that we are putting into the areas. It is one of the methods we use to try to elongate the life of the area. It is not a cure-all. For instance, there would not be a big market for selling Hudson River spoil.

SENATOR PARKER: Does the Army Corps of Engineers have any objection to creating an island similar to Governor's Island in the New York Harbor? Wouldn't that be a way to dispose of it, maintain the toxic metal in there, so that if they did leach out it would still go into the same place where they are going now anyway, and it would at least avoid the problem of the nutrients getting out into the ocean?

MR. SNARSKI: It is an alternative. Of course, when you get into the costs and the benefits, they would have to be weighed.

SENATOR PARKER: Well, every place you dump now you dike and fill in anyway, right?

MR. SNARSKI: No, it is not diking the ocean. The diking costs---

SENATOR PARKER: I know it is not diking in the ocean, but on all your inland waterways, such as the Chesapeake and Delaware Canals, when you redid them, it diked everything for about 200 feet all along the canal.

MR. SNARSKI: Right.

SENATOR PARKER: I mean, if you do it anywhere else with the diking, it is just a matter of cost, isn't it? There is no environmental change that would be brought about, is there?

MR. SNARSKI: Well, the only environmental change would be whatever marine life is utilized in that area right now, be it shell fish, or whatever. The cost of comparing dikes, such as you have seen in the C & D Canal or along the Delaware River, to the cost of building a dike in the water is quite a different question. There is a significant cost factor involved in that. But it is a feasible alternative. If there is enough water area there out of the channel, dikes could be located there.

SENATOR PARKER: What steps has the Army Corps of Engineers taken to do that in order to design it or look into it?

MR. SNARSKI: That question I can't answer for New York. In Philadelphia, we have analyzed our disposal requirements for the next thirty to forty years, and we see our existing disposal areas lasting about twenty years. I would say that at this time, this is the only feasible alternative that we can see right now in the Delaware River, and that is, once our onland sites are used up, we would create such an area in the Delaware Bay. I can tell you further that in Norfolk Harbor they do have such an island, Craney Island in Norfolk.

SENATOR PARKER: Where?

MR. SNARSKI: It is called Craney Island. It is down in the Chesapeake Bay or James River. It is one of the areas around Norfolk, Virginia. So it is something that is technically feasible. And I think the real question comes down to the benefit-cost ratio.

SENATOR PARKER: Yes, it comes down to just having somebody like the DEP say that you are going to do it this way, and provide the funds.

MR. SNARSKI: That is the bottom line, yes.

SENATOR PARKER: Now, you heard the figures here today about 50% of what we receive here is all coming from New York?

MR. SNARSKI: Yes, any dumping in that area is from New York. I would presume that the maintenance of New York Harbor - although I don't know this for a fact - is probably in the same 6,000,000 cubic yard range per year that we have in Philadelphia.

SENATOR PARKER: Are you a scientist?

MR. SNARSKI: No, I am an engineer.

SENATOR PARKER: It is hard for me to believe that 50% of the nutrients, then, can come from 11 million tons of dredge spoil in the New York Bight.

MR. SNARSKI: Well, the problem with the dredge spoil is that it sits out in the channel, and even though the water quality has been improved in recent years from out-falls and such, the outfalls still contribute a major amount of the pollutants in the river system. And the problem with the dredged material is that it picks it up as it settles out through the system.

SENATOR PARKER: Can it be more than the raw sewage coming out? You know, that is hard to understand.

MR. SNARSKI: That I could not answer for you.

SENATOR PARKER: I mean, these are the things that are a little bit difficult for me. I understand that dredge spoil can be enriched, but to create 50% of the problem when you are dumping 500 million gallons of raw sewage a day, I have to question that as a layman.

MR. SNARSKI: I can't answer that one for you.

SENATOR MC GAHN: Barry, actually, I think you get more nutrients the higher the quality, unless you go to tertiary because it has not been bound. Oftentimes, raw sewage is bound and more likely to come down and sink to the

bottom. Now, by the same token, too, if it were a free flowing stream, the nutrients may not be there in solution form.

Are there any further questions? If not, thank you very much. Our next witness is Thomas Glenn, Interstate Sanitation Commission.

T H O M A S G L E N N: Mr. Chairman, members of the Legislature, I may be able to add a little information on the Corps, because we do most of the monitoring for the tri-state area of New York, New Jersey and Connecticut on a regular monthly basis and twice a month in the summer.

My name is Thomas Glenn. I am Director and Chief Engineer of the Interstate Sanitation Commission. In 1974, this Commission was requested by the U.S. EPA-Region Two, and the States of New York and New Jersey to develop a management plan for disposal of sewage sludge from the New York-New Jersey metropolitan area. I won't go into detail on that. It mentions that our main recommendation was to go to composting and spread on the land sludges that were low enough in heavy metal material concentration, and the other should go to pyrolysis.

Now, we came out with our study management plan at about the First of November, and some of you might have seen it, and we recommended that we phase out ocean dumping by 1981. Actually, there are other problems in the area that I should discuss to put it in proper perspective, because the sludge dumping alone is not the only sludge problem that we have in the area.

Our problem right now is, of the sludge that is going to the ocean, 92% of it is too high in heavy metal toxic materials, PCD's, you name it, to be spread on the land. Somebody mentioned earlier about the organite. Well, one of the troubles with that is, it is all right, if you want to make it available for a few people, but even in their case, you are not allowed to use more of it, more than one dry ton per acre per year. You need the State of Rhode Island to get rid of the sludge that we are talking about in this area alone.

We talk about the pyrolysis. It is one of the methods that we recommended, but there is an environmental problem there. Someone mentioned the problem of air pollution. We are doing some work now on a special study in Belle Mead, New Jersey on a small pyrolysis unit to determine problems of air pollution and also the amount of material and the residue.

Now, another false impression that people have about pyrolysis is that they have a feeling that you take a large amount of sludge and end up with a handfull of ash. Well, this is misjudgement, unless you started with the liquid sludge. But if you do it on a dry weight basis, for every dry ton of sludge that goes through pyrolysis, you have a half of a dry ton to get rid of, which, as was mentioned before, can contain a lot of heavy metals. So we are talking about - at least at the present time - over 100 dry tons per day to put into a landfill, and in the future it could be twice or three times that much, so this is not the greatest solution, even though it may sound like it on the surface.

The other reason we think composting has an advantage is because not only will you turn to land to get an ultimate solution to the problem, you are just not moving the problem to another area, but also we think that overall costs can give the cheapest solution. Also, we think it can be the speediest solution to get it out of the ocean, because if we get a real effort for the first time on pre-treatment-- after all, the federal law is 4 years old, and we are still waiting for the guidelines which are supposed to come out

within the next few months. Now, the thing is that unless we look to pre-treatment before we get into the sludge - you can't remove it from the sludge once it gets in there - we are just kidding ourselves, at least in the New York metropolitan area. Another reason we want this pre-treatment is because it is the fastest way to get it out of the ocean. If there was a real effort, you could get a lot of pre-treatment done from any of the sludges, and you could probably beat the 1981 date. Actually, it would be optimistic, because we have been so slow proceeding with pre-treatment. Everybody tells you about all the problems of pre-treatment and not many of the solutions to go about it.

Another thing that should be pointed out - which I don't think anyone previously pointed out to you - is that we daily put in as much sludge in the local New York metropolitan area as goes out to the ocean dumping grounds. What a lot of people didn't seem to realize until recently, and some of this was confirmed in our sludge study, was that 60% of all the sewage solids for the whole year in these combined sewers never reaches the sewerage treatment plant to be taken out. So, what happens in these big combined sewers - the dry weather flow, plus the rainfall when it rains - is that it acts like a settling basin, and it settles out in the bottom and when the rain comes, it goes out with your local waters instead of being even hauled out to sea. So, we have a real problem with a lot of sludge that is being dumped locally even after all the treatment plants have been completed.

Now, somebody stated, we have over 400 million gallons a day that is raw. And the chances of getting this up to secondary treatment for the year 1990 or later is quite remote. The earliest you could get most of the 400 million out would be in the latter part of the 1980's.

SENATOR PARKER: Why is that? Why, if the funds are provided?

MR. GLENN: Well, the funds have not been provided. I will tell you why. For instance, in some cases when the Federal Government required secondary treatment all across the country, while this is desirable in some areas, but in other areas it is not, they had a treatment plant ready to design up on the Hudson River in Manhattan, and the money was raised, and it was going to cost just slightly over \$100 million. Then people decided it wouldn't look good aesthetically, and they decided not to do it. And at that time, the standards for treatment became secondary. Then some people who had land in there didn't want the plant built, so they quickly got the people of Harlem upset because they were building the plant there - just because it was near Harlem. Well, then Harlem representatives said they wouldn't let the plant be built; they would riot first, unless they give it full secondary treatment. Well, this is an era of combined sewers, where over 60% of the sewage solids don't get there anyway, so I was not too impressed with this high degree of treatment in that area. I would much rather see them go ahead with the intermediate treatment plant at this time, and proceed.

Okay, they finally redesigned the plant. That put in a four-year delay, to redesign it and to carry the earth load for a park they were going to put on top of it. They redesigned it for full secondary treatment. Before they got through building the foundation out in the river just for the treatment plant, no part of the treatment plant, they had already spent \$250 million. It gets worse. I won't give you all the national details, but the latest price of this thing is one billion dollars. There are, of course, some physical problems up there. Now

they are talking about phase construction. Well, I can read between the lines, and what phase construction means is they are going to start with a primary plant, and maybe sometime in the future will build a secondary. But even so, I think there are a number of things that have to be addressed to overcome some of the problems that we are facing.

The studies of the marine algae in the New York Bight has been very limited. The role that the nutrients play in their growth is debated by different scientists, as you have found out already today. Most agree that nitrates, phosphates and carbonaceous material are involved in algal growth. The role of each is where agreement ends. With present lack of knowledge, we would not recommend a huge expenditure of money for a possible quick solution to the problem. For instance, some have recommended tertiary treatment to remove nitrates and phosphates. This would have a tremendous cost and some believe carbonaceous material could still trigger the algal growth. Also, the impact of discharge from combined sewers could largely negate any benefit from tertiary treatment. Nobody even mentioned carbonaceous materials as a possibility. For instance, every time it rains - all the treatment plants, including the one I have talked about that is going to cost \$1 billion - one billion gallons of raw sewage will spill out through the gateway park and out into the ocean eventually through the Hudson Channel. It is worse than raw sewage. I have already told you, 60% of the sewage solids that are already passed through the treatment plants in the area never get to the treatment plants; they also go off in this first sludge. So this is part of the answer to the previous question you asked, why are the sludges that are dredged in the New York Harbor not quite as pristin pure as described in Philadelphia. I would like to sample some of that. I am not sure how pristin pure some of that is.

Up in our area, you have bottom muds that are in many cases as much as 30% oil, and along with these solids that are spilled out into the waterways, you really have a muck. Now, somebody brought up the question of this Corps of Engineers building that out. I have thought about that for sometime now, and I will tell you why: they have spent a lot of money studying this, and they have built a model down in Vicksburg - and you cannot always depend completely on models- and one thing it did do, it reversed the flow of the arthur kill which means it would spew more waste down in the Raritan Bay than at the present time. It would actually affect the flow.

One of the big drawbacks of that - and there was also a private company who was going to build another model - was the cost. They looked into the costs, and they changed their minds. So one thing, if you build this island down there, and attempt to put the dredge spoils in it, the trouble is, you would put in most of it as liquid. You would have to build a treatment plant to take care of the liquid, or you would fill the thing up in about two years. Well, I don't believe there is a treatment plant you could build that would treat that muck to meet the standards of that particular area.

Let me get over to a few things, I think, that could cut down the sum of the nutrients. I agree with some of the statements that were made. We have to start somewhere, and anything we do would be a start in the right direction. There are several ways that the quantity of nutrients may be reduced: Complete construction of secondary treatment plants to reduce carbonaceous material in

the discharge; discontinue the use of digesters that are being used; also, when you point the finger to New York, you are pointing it a little bit strong when you say 60% of the problem is there. One of the reasons they have more sludge, for instance, going out is because they have mostly secondary treatment - much more than you have in New Jersey. In fact, New Jersey has only one plant that has secondary treatment. So as soon as your plants are updated to secondary treatment, you are going to double what you have now. In fact in the year 2000, as far as sludge is concerned, we think New York and New Jersey will be putting out about the same amount for disposal in some form.

One reason we say stop using digesters - which is what New York plants do, and some New Jersey plants - is because the super-latent from the digesters is high in nutrients and this is returned to go back through the treatment plant in a soluble form, and the treatment plant doesn't take any nutrients out. So, by actually putting the digesters in, you are putting in more digesters.

Also raw sludge has a higher BTU value, so if you go to pyrolysis, you will get more BTU's out of the process, if you don't digest it, and also you save the cost of digesters. Quite a few plants in New Jersey don't have them, and I think it would be a fair waste of money. There are a few places in New York City that have digesters, and I would not recommend to them to take it out, because they have let the treatment plants have developments of homes all around the place, and from the odor standpoint, until they get the thing off to where they are going to treat it, they might have some problems. But they have found in composting you couldn't work with the raw sludge with a digester without having any odor problems in the localized area.

Another thing that I think should be considered is, 98% of all the treatment plant areas of the northern part of New Jersey and the New York metropolitan area are combined sewers, so we are faced with this---

SENATOR PARKER: Is that true in North Jersey also?

MR. GLENN: New Jersey has their combined sewer plants up in that area, too. If you take the Passaic Valley as an example, they have something normally like 275 million gallons a day at the present time, and when it rains, it gets up to maybe 600 million gallons a day.

SENATOR PARKER: But does that all go through the sewer plant? In other words, the rain water---

MR. GLENN: If it does, it goes through very rapidly. It doesn't take much of it out, but most of it is bypassed during times of heavy rain. In fact, that is the way the regulators are constructed, so that you keep back the dry weather flow, and once the rain builds up, then in most cases, it shuts off the flow to the treatment plant, because---

SENATOR PARKER: And the raw sewage just goes into it.

MR. GLENN: That's right, that is where the one million gallons I am talking about goes, through the gateway, after all of the raw sewage has been picked up during dry weather.

SENATOR PARKER: Well, let me ask you this: Isn't the raw sewage at that point septic? It is laying in the lines, so doesn't it get septic?

MR. GLENN: Well, to a certain extent, but you get enough rain often enough that it moves on. But out in the waterways it is not septic because we put so much heavy metal in it. We keep it toxic enough so the little rascals can't

work, and so we have no septic odors. If you take the arthur kill, it gets down to zero dissolved oxygen for three weeks during the year right now, and you don't get hydrogen sulphide odor. You don't get any odor except what local chemicals have been dumped recently, or things of this nature, but not the septic action.

In our report, one of the things we stressed the most is the pre-treatment so that all alternatives to ocean disposal for sludge are better, but also we stress clean up of the toxic conditions in the local waters. Another suggestion which wouldn't be very popular, as you gather, is to move the dredge spoils out 106 miles. If you are going to move something out 106 miles, that would be a good candidate, because it has a lot more of the contaminants or heavy metals. Some people say that 95% of the heavy metals are going out the New York Bight from the dredge spoils. Some are not quite as bad. They say some are 75% from the dredge spoils, and then you have the nutrients that they dredge up from the harbor and you have a big B. O. D. load which affects the oxygen.

Also, I want to stress again pre-treatment of heavy metals and toxic materials, to speed up the phase-out of sludge from the ocean. Now, you won't care for my next statement. We would be less than candid if we did not state that due to the combined sewers, storm water runoff, sewage effluents, and similar climatic conditions + even with all the steps taken above - the fish kill could occur again this summer.

As stated above, it is essential that any solution to the regional sludge problem include the prevention of entry of the toxic metals and other similarly harmful substances into the matter discharged into public sewer system. One of the Commission's recommended alternatives to ocean disposal, composting - only 8% is being recommended at the present time, and of the 8% - a lot of people are rebelling against. Some people said before that sludge is repulsive. That is the reason we recommended going to composting because it does take out the odors, and if you saw raw composted materials --- It looks more like a salt. We are hoping by putting the responsibility on the counties for placing it on their lands for a while, it will build up acceptance, and then you can find other ways of disposing of it as the quantity of sludge builds up.

For instance, right now a lot of people in New York City are not too excited about our recommendation of composting for two of their treatment plants on Staten Island. They say, "where are we going to put it; we don't have room." Staten Island has 5500 acres of recreational land including parks, golf courses and so forth, not counting all the parkways which most of you notice, and we figure at the present time, they would have to use 300 acres. So it is a case of people being repulsed at sludge from the start. But I think if we are going to really make any headway, we have to get the pre-treatment, and then go to composting.

I will try to bring it to a close, quickly. We all know why we haven't been out of the ocean before now, because the present ocean disposal on the average costs \$30 a dry ton. Composting by the county and placing it on public land such as parks, golf courses and along roadways, would have the least economic impact since the counties already have front-end loaders, trucks and much of the personnel which would also be used for the composting operation. This is still estimated to cost approximately \$75 per dry ton. Pyrolysis is estimated to cost from \$90 to \$160 a dry ton, depending upon the site location, and there is still the problem of residue to be disposed of in the landfills that we talked about.

In New Jersey, to start with, there are over 100 dry tons per day. I don't know where you are going to put the landfills to do it.

SENATOR PARKER: This is for pyrolysis, you mean?

MR. GLENN: Yes, because you only reduce the dry weight volume by half. Now, there has been some work done in recent months, which is very very encouraging. They have taken mixed ash from a power plant and added some chemicals so it becomes such a dense material that it cuts down any leaching. This is encouraging, and we are especially encouraged because we think this may be a solution to this pre-treatment.

If you mention this to industry, they will ask you what you will do with their sludges. Well, we believe this might be a way to bind up these sludges also, so that it can be taken out of the environment and not continued to be moved around.

SENATOR MC GAHN: Mr. Glenn, the cost that you are estimating here, does this include capitalization of the facility?

MR. GLENN: This is what we think the whole plant costs. Now, the problem is what I am going to state next. The problem is, at the present time we think the best solution is composting. I think from what has been said here today, New Jersey thinks this is a problem, but as of now, for pyrolysis they can get anywhere from 75% to 87.5% of the cost paid by the federal and state government - as is done in New York State. They won't get hardly a nickel for composting. So what I am trying to say is the money from the local people will be less for pyrolysis than for composting.

We have asked Congress to make some changes, so that there can be some subsidy toward composting, so that it won't be a selection just because it is cheaper. In New York City, for instance, unless they get some encouragement or are forced to do it by the State or the EPA, I am sure they are going to either pyrolysis alone or pyrolysis with solid waste, and I think in overall costs it is costing a lot more money and should be avoided if possible.

I think the Legislature of New Jersey should consider the possibility of some help toward composting. In conclusion, we recommend that the Legislature support the efforts of the New Jersey Department of Environmental Protection in the pre-treatment of heavy metals and toxic materials prior to discharge to municipal sewerage systems.

SENATOR PARKER: Excuse me, on that point alone - and I think we do have some bills that give sales tax advantages or something, to those who pre-treat, and in a lot of our industry we now require pre-treatment before it goes into the sewers - as I understood the testimony here today, you would have to require pretreatment in every home. They are talking about this even in a bedroom community.

MR. GLENN: Well, you can get them to a low enough level so that you can put it on the land, because we are not talking about something that is completely void of all metals. New York City uses this argument, but they have not been able to explain to me why the housewives in Queens - where they have industry - are much worse than the ones on Staten Island, where they meet the requirement of the Department of Agriculture for putting it on the land.

We are not recommending that you put it on crops now. We are talking about putting it on public land that is not going to be used for edible material. But we do think, and have no doubts in our mind, that if people will start looking

toward solutions of pretreatment we can get it down to a low enough level so that we can put it on the land as we are proposing now. But the trouble has been that nobody wants to lose any rateables, and if they would use a little bit of imagination, instead of thinking about all the problems, they can also find ways to save their rateables and also get the solution to both problems.

Also, you have to remember, with these heavy metals, the plating waste people, in New York City, we are talking about hundreds of them. Some of them are anywhere from two people on up, but the quantities we are talking about in a lot of the cases are vats dumping. They save it for a week, or two months, and sometimes small quantities, but they are very potent, and when you put it in with all this sewage, you are diluting, and then the treatment at the treatment plant is not only difficult, but in the case of the combined sewers, over 60% of the heavy metals don't even get there. The only part that usually gets there in any quantity is the soluble part, and it runs right on through a secondary treatment plant without any removal.

We suggest modification of your Senate Bill 1659 - that is the only one I will mention, because the others are ways that you want to raise money and things, and I think you can best decide how you are going to do it - and this legislation would require immediate removal of sludge from the ocean, and placing it on landfills until composting or pyrolysis could be substituted. This would move the problem from the ocean to the land. The two largest plants in New Jersey that barge to sea have no dewatering equipment at present and this would mean over one million gallons of wet sludge per day which would be poured into landfills. It would be difficult to prevent this from running into streams or leaching into the ground water. Emphasis on implementing recommended alternatives of composting, pyrolysis, or co-disposal with solid wastes, would be preferable to an immediate landfill solution. The National Oceanic and Atmospheric Administration should be urged not to phase out the MESA Project in the next two or three years, but to expand the program to determine some of the needed information on algae growth and its control.

Now, we appreciated this opportunity to discuss a problem which concerns all of us and will be pleased to answer any questions from any member of the Committee.

SENATOR RUSSO: Thank you, Mr. Glenn. Since we only have three witnesses to go, we will complete the testimony today. Senator Mc Gahn will Chair the remainder of the hearing. For your information, the transcript of this hearing will be typed up and provided to each member of the Committee, including those who were not able to attend today. This will be reviewed by the members of the Committee before action is taken on any of the bills.

The record will be kept open for several weeks, in the event that you have any information you would like to submit after today. Feel free to send it into the Committee staff, and we will make it part of the record.

SENATOR MC GAHN: Mr. Larry Miller, Dupont Corporation.

LARRY MILLER: I ask that Dr. Lloyd Falk give the testimony for the Dupont Company.

L L O Y D L. F A L K: My name is Lloyd L. Falk. I am a Principal Consultant in the Engineering Department of the Dupont Company, Wilmington, Delaware. In that capacity, I specialized in the field of water pollution abatement and waste water control.

My purpose today is to convey to you something about the way we look at the applicability of ocean disposal for industrial wastes, both generally and specifically as applied to wastewater in one of our New Jersey plants. Before I get into specifics, however, I would like to point out that man draws upon reservoirs of nonrenewable resources which occur in the oceans, in the atmosphere and in the ground. If we use these resources, laws of nature require those materials to be returned eventually to the oceans, to the air, and to the ground whence they came. We may change the nature of the materials and how we return them to the environment, but we cannot alter the ultimate requirement that they be returned.

Then, the question properly is: How do we return those materials we have extracted from the world around us in such a way to be compatible with the environment we wish to maintain? If we approach this problem wisely, we will recognize the oceans, the ground, and the air all have assimilative capacities and, as users of resources, it is our duty to determine and use these assimilative capacities wisely.

Barging wastewaters to sea can have distinct advantages over other ways of recycling waste products back into the environment, products which often would ultimately reach the ocean anyway. A barge has a mobile discharge point, and therefore you have a wide selection of locations to disperse wastewaters. If wastewaters even treated are discharged to rivers, you cannot divert miles of rivers. Sewer pipes discharged to the ocean can be placed only within narrow limits. This means that by proper evaluation and control you can disperse wastewater from a barge with minimum, or even no, environmental impact.

We have evaluated the ocean disposal of wastewater generated at one of Dupont's New Jersey plants. This wastewater is currently barged to the 106-mile site, which is beyond the edge of the Continental Shelf and over 100 miles from the coast of New Jersey. The wastewater contains at least 85% water, 10% to 15% of a naturally occurring seawater salt, and less than 1% of soluble organic material.

SENATOR PARKER: What is that soluble material?

MR. FALK: Sodium sulphate, which occurs as common seawater salt.

SENATOR PARKER: What is the soluble organic material?

MR. FALK: The soluble organic material is primarily methanol and nitrogen containing compounds.

SENATOR PARKER: Are they toxic?

MR. FALK: Well, I will cover the studies we have done in this regard, Senator.

Our most recent effort to insure that we are safeguarding the environment is a \$200,000 evaluation carried out in two parts. The first is a study of the biological effects of this waste water on appropriate marine organisms, and the second is a study of the dispersion characteristics of this waste water at the actual disposal site. In the biological effects evaluation, we did chronic and sub-chronic studies to determine the level at which our waste water would have no effect on the marine organisms which we tested. In the dispersion characteristics evaluation, waste water concentrations in the wake of the moving barge were determined from over 16,000 analyses taken at the 106 mile site under conditions least likely to enhance dispersion. These dispersion data show that at the barge speed and release time used for the study, the wastewater concentration almost

immediately - and when I say "immediately" I mean within one minute - declines to levels which are below the no-effect concentration established in the biological effects studies. In other words, the study showed that our waste water caused no harm to the marine environment.

In addition to studying the impact of our ocean disposed waste water on the marine environment, Dupont has spent over \$400,000 evaluating alternatives to ocean dumping which include carbon adsorption, incineration, biological treatment, wet air oxidation, steam stripping, solvent extraction, chemical oxidation, ultrafiltration, coagulation, landfill, deep well injection, discharge to inland waterways, use as fertilizer and use as construction materials.

These alternatives were found to be unsuitable for a variety of reasons: For example, inordinate energy requirements. In the case of evaporating of waste, up to 16 million gallons per year of fuel oil would be required, enough to heat about 16,000 homes.

The high salt content causes operating difficulties for such alternatives as biological treatment, as well as incineration.

Wet air oxidation, carbon adsorption, steam stripping, and solvent extraction create problems for subsequent disposal of residual wastewaters to a receiving stream at the plant site.

Landfilling - these are liquid wastes - or evaporating from ponds is not practicable because rainfall exceeds natural evaporation in New Jersey.

Geological formations in New Jersey are unsatisfactory for use of deep well injection, and the waste has no value as fertilizer or construction material.

We recognize that use of the assimilative capacity of the ocean for disposal of waste materials must be carefully regulated. Our current ocean disposal operation is controlled by the U. S. Environmental Protection Agency under regulations adopted pursuant to the federal "Marine Protection, Research and Sanctuaries Act." We believe that the biological effects studies, disposal site dispersion studies, and studies of alternatives to ocean dumping required by EPA, as well as monitoring studies specified in our EPA-issued ocean dumping permit are all stringent requirements which ensure that the most environmentally sound alternative for disposal of our waste water is used. We therefore feel that state control of the ocean disposal of industrial waste water is unnecessary.

As a point of information, and something which was mentioned earlier by Dr. Paulson, we would like to mention that we have been advised by our legal counsel that under the Marine Protection Research and Sanctuaries Act we are excluded from control of the ocean disposal of waste water.

In summary, we feel that our studies on our ocean disposed waste water support the view that regulatory agencies should not categorically rule out any specific alternative for waste disposal, including ocean disposal. After all, that alternative may prove, in certain instances, to be the most environmentally acceptable. Other disposal methods which might appear more acceptable to the public may ultimately prove to be environmentally more costly when one considers the energy requirements, the disposal of residues from the waste treatment operations themselves, and other related difficulties. Ocean disposal, strictly controlled and monitored, can often provide the most environmentally sound, economical alternative available for managing waste products of man. Thank you.

SENATOR PARKER: What is the 1% organic, lead or what?

MR. FALK: No, lead is inorganic material. We are talking about organic material such as methyl alcohol and various types of nitrogen components.

SENATOR PARKER: Well, does that break down?

MR. FALK: The organic material in these wastes is biodegradeable.

SENATOR PARKER: So, you are 106 miles off shore anyway, right?

MR. FALK: Yes, and the prevailing current in that area, I believe, is to the south.

SENATOR PARKER: Does any of that material contain nutrients or anything that would contribute to this algae bloom or the over-enrichment of the ocean?

MR. FALK: There is nitrogen in our waste. However, we are really outside of the New York Bight, much less outside the Apex. As I understand it from the testimony given here today, the nutrient problem is confined to the Apex. Our concern, really, in testifying here today is that some of the bills before the Assembly and the Senate define sludge in such a way that it includes industrial waste. Therefore, the effort to ban disposal of sludge, for example, would mean that automatically we would be faced with the same problem, a ban of industrial waste. Since we feel that industrial wastes should be handled in different ways than sludge, and since we also feel that what we are doing is environmentally reasonable and sound, that is the reason why we are here today.

SENATOR MC GAHN: I am glad you said that we are talking about two different things. In one instance we were talking about sewer sludge, and you are talking about industrial waste and chemical sludge which you are not permitted to be dumped twelve miles off, but rather 106 miles out.

MR. FALK: Yes, EPA has indicated that our waste should go to the 106-mile line.

SENATOR PARKER: Why do they allow toxic waste, such as lead from National Lead, to be dumped twelve or fourteen miles off shore?

MR. FALK: NL Industries is not dumping lead wastes. It is dumping waste from the manufacture of titanium dioxide. There may be some lead in that waste, but that is not the product.

SENATOR PARKER: Is that what we call the acid waters?

MR. FALK: The acid grounds, as one of the maps showed it, are in the upper end of the Hudson Canyon area---

SENATOR PARKER: You mean where you are dumping waste?

MR. FALK: Our waste from our plant in New Jersey is not an acid waste.

SENATOR PARKER: We have an area that we fish in which they call the acid waters.

MR. FALK: That is correct. That is the area---

SENATOR PARKER: Where National Lead dumps, isn't it?

MR. FALK: Yes, that is correct.

SENATOR PARKER: Well, why do you have to go 106 miles and National Lead only 12 or 14?

MR. FALK: We have asked that question of EPA in the past.

SENATOR PARKER: I was just wondering.

MR. FALK: They indicated that--- At one time, we did dispose of our wastes in the acid ground, and at the time they issued us our first permit under the Marine Protection Research and Sanctuaries Act, they indicated that

they wanted to separate the acidic wastes from the other industrial wastes, so they put us in the 106 site with the other people who were discharging organic materials. This did cost us some additional money, but---

SENATOR PARKER: How much does it cost a year to dump out there?

MR. FALK: Unfortunately, I don't have those figures with me. If you want them, we can provide them for you.

SENATOR MC GAHN: You don't dump that frequently out there, do you?

MR. FALK: Probably once a week, or once or twice a week; something like that.

SENATOR MC GAHN: You have said that Dupont has spent over \$400,000 evaluating alternatives to ocean dumping. You are talking though strictly about what you are dumping out there, not strictly industrial wastes.

MR. FALK: Yes, we are talking about looking at alternatives to the ocean disposal of the waste waters that we take out there.

SENATOR MC GAHN: The waste water that you take out there?

MR. FALK: Yes, that is correct.

SENATOR MC GAHN: Because some of these alternatives are really not applicable to sewerage sludge.

MR. FALK: I think that is right.

SENATOR MC GAHN: Thank you very much. Dr. Richard Raush, Executive Director, New Jersey Coalition for Survival.

R I C H A R D R A U S H: I am here representing the New Jersey Coalition for Survival. The bills that we received for review are only those listed on the sheet that I have given you. That is, 1659, 1809, and 1808. I got these from one of your legislative aides, and unfortunately, we didn't get them all.

Our group has made these recommendations, and let me just quickly read them to you. There are not very many. After that, I would like to make a general comment on some of the testimony that has been given here today.

With respect to Senate Bill 1659, the January first date has, of course, passed. The definition of sludge given in this section changes the usual meaning to include that portion of sewage usually referred to as effluent. The language in Section three suggests that no substantial action should be taken or will be taken until the December thirty-first 1981 deadline is approached. This approach on this aspect of the bill is unacceptable to members of our group.

In Section Six, designated sewage processors should not be limited to existing processors, in our opinion. No decision in this regard should be made until it can be shown that additional processors could not be employed to good advantage.

In Section Seven, pretreatment standards are the key to acceptable land disposal alternatives. Their review should receive the benefit of legislative review. These standards should then become part of the New Jersey Statutes.

What we are saying here is that we believe this is so important that this should be written into the law and not simply promulgated through DEP rules.

Senate Bill 1809, I understand, is not to be considered here. Shall I skip over this, Senator Parker?

SENATOR PARKER: You may as well cover it.

MR. RAUSH: State taxes on motor fuels purchased for use in the motor boats or motor vessels should be refunded to the purchasers of such fuels. Any monies not so refunded should be used for the improvement of state owned launching and docking facilities or for similar boating related projects.

The sewage problem is a common problem; therefore, remedies should be funded from sources with the broadest possible base.

Senate Bill 1808, money for improved sewage handling facilities should be carefully controlled. Much has already been wasted in duplication and in the support of ill-advised projects. Adequate technology is available for effective sewage treatment. This technology can, no doubt, be improved, but the State of New Jersey should not be the agency for such research.

It should be stipulated that these monies will be spent to lessen the environmental impact of sewage handling and disposal. Sewage treatment plants must incorporate the best available technology. Secondary treatment plants must be upgraded. Now, we don't quarrel with the testimony that was given here by the DEP today. They said that we first have to get to the secondary level - if I understood them correctly - before we could consider anything else.

New plants must be designed to reduce nutrient levels in their effluents to the lowest possible levels.

Let me comment on one point of testimony that was given here today that has apparently caused a lot of trouble. Commander Swanson showed us some charts that were projected on the screen here showing relative amounts from dredge spoils, the Hudson River, the sump disposal site, et cetera. As he showed those, he commented. These percentages did not include an assessment of availability. I have spoken at some length with Dr. Joel O'Connor or one of his colleagues from the MESA Project group, and the MESA Project group has not yet effectively modeled this environment, this New York Bight environment. No percentages can be placed on the speculative sources of nutrients or particular sources of carbon with respect to availability, with respect to their impact on algae blooms like we had last year. It is not appropriate to assume that the sludge that is dumped at the Apex of the New York Bight accounts for 5% of the problem, as has been suggested from time to time. There is no environmental model that is available now or that is likely to be available in the future that will allow us to weigh these things with respect to percent of responsibility.

Now, we can't measure them and say by weight so much of the nitrates came from this source or that source or some other source, but this is a lot different than saying there is 5% responsibility for sludge, so therefore we shouldn't do anything about it.

I think as you go over Dr. Swanson's testimony you will find many disclaimers in there for his overall argument that sludge is a relatively anoxic substance and therefore we shouldn't do anything about it now, or maybe not even in 1981. Our group is proposing some action on this business of sludge in shallow - about 30 or 40 feet - in shore water where the sediment, according to Dr. Paulson, is located, not out away from shore. We don't see how any member of the Legislature will be able to face the public if, for example, what we hear about a fish kill were to come true. If you have advocated what we believe is essentially a do-nothing policy---

SENATOR PARKER: That is what has happened, but we don't advocate that, or I don't.

MR. RAUSH: Right. We don't see the movement of the sludge dump site as a cure-all. We only advocate this measure as an interim, short-term "solution." But we think every possible measure, short-term measure, should be explored to minimize the impact of waste disposal on the Bight.

I would like to point out to you that figures differ by the impact on the clam industry alone may be as high as \$100 million from last year's action. This is nothing to sneeze at. And why should our coastal industries, or our fishermen or our sports fishermen here bear the economic burden of this dumping action. You have to ask yourself that.

I don't think the coastal industries should subsidize New York City or any other large segment of society. Now, ---

SENATOR PARKER: What is your expertise?

MR. RAUSH: I have worked with algae blooms in Southeastern Alaska, so I do know something about them. My background is in Zoology from the University of Washington, the University of Alaska, Arizona State University, the University of New Mexico, and some other schools. I am not a resource management consultant.

SENATOR PARKER: I just wonder if we could stop our sludge and do something about it? What could be done other than try to get the federal government to require New York City to dump elsewhere? It does come down this way, so what would happen further out in Long Island? They dump up that way.

MR. RAUSH: Well, it was very disappointing to hear the testimony of the EPA. To use the business of, do we have an environmental impact statement for the 106 mile site, as a dodge from taking action, this is very deceptive.

SENATOR PARKER: Do you advocate going out to the 106 mile site?

MR. RAUSH: Yes, we absolutely do.

SENATOR PARKER: Why? What makes you think that will make any difference, number one; or, number two---

MR. RAUSH: It will make a difference, but whether it will prevent a bloom or not, that is another thing to be argued. First of all, let me say that we have heard testimony here today to indicate that the cost of going out there is no more than the cost of composting during a similar period. Now, if that is true, the arguments that we heard from Senator Forsythe's representative don't follow. He said we shouldn't spend this money on dumping at the 106 mile site, because we could then spend it getting ready for composting. These are ongoing costs. Do you see what I mean?

So we don't see the cost as a major detriment. Let me suggest to you that there are some reasons why MESA people and NOAA people and Department of Commerce and the State Department might not like to go out to this site other than cost factors, and we don't believe the major factor is cost. There have been agreements from other countries not to dump waste materials on the high seas. I have no direct evidence at my disposal now to allow me to conclude that this in fact is the reason that the MESA Project group at Stoney Brook has been opposing this move. But this is what I infer from their comments, that this is probably behind their stand.

I would like to comment just briefly on the testimony of Mr. Forsythe's representative. I belong to the American Littoral Society and the American Society of Oceanographers. They have by no means endorsed any stand on this one way or the other. The majority of the scientists that might be concerned with this project - that is professionally concerned in their area of expertise - have

given no voice to any sort of model that I know of. The suggestion that scientists said this or scientists say that or anything is damn foolish and misleading. It is simply not true. You were given a pamphlet here that came out of a meeting at Lewis, Delaware, and it was suggested that this provided scientific rationale for the statements of Mr. Forsythe's representative. I suggest you read it carefully, and you will find that it doesn't. As a matter of fact, most of the people that delivered testimony there were quite candid, and you will be able to get this problem, I think, in a fairly good perspective from reading it. It certainly doesn't substantiate any action as to whether the dredge site should be moved or not.

I can see many complications involved here. But I am thinking now of the fishermen, the shore industries, and the name of our organization is the New Jersey Coalition for Survival. You would think it involved all environmentalists. But it doesn't. We have a few of our groups who are environmentalists, but mostly it involves businessmen. So we think that it would be good business for New Jersey to make some short-term investments. Whether they are effective or not, that is something else.

We are not denying that the nutrient effluents that are coming out of the treatment plants - some 18 of them, or how many there are of them - may be even more important than the sludge dumping. As a matter of fact, when I joined this group, that was my preliminary assessment. I said it then, and I really have not changed my mind, and I think this may account for most of the action, but we do agree with DEP that the movement of the sludge site represents something that can be done immediately. We can actually take action here.

Now, we know there are some problems, and you mentioned one earlier, that is, people saying, we have done something now, and we don't have to worry about it any more. We hope that this move can be made and put in perspective and this will be part of an overall program of action including gearing up for a land disposal method. But I really don't see, myself - putting myself in the shoes of the legislators of New Jersey or anywhere else - how my constituents would view opposing measures of any sort if another disaster occurs like last year.

I would like to make one statement here. Dr. Swanson said that the bloom of ceratium occurred and it was not in any way related to nutrient levels. Well, the only thing I can think that he meant by that statement was that if we were to take nutrient levels in the water, that is, unbound nutrients - nitrates, phosphates - and measure those, the increase in ceratium was not correlated with any especially high levels of these nutrients that he measured. But believe me, dioflagellate blooms, just like the blooms of other organisms, are related to nutrients. Dioflagellates have a peculiar pattern of nutrition. They can live like plants, using simple nutrients like nitrates and phosphates, or they can eat particular organic materials and live like animals, and this apparently they did last summer - when they take on this animal form of nutrition they consume significant amounts of oxygen and this was part of the problem last year.

I am just using government reports as my source of information. I haven't been involved in any independent research program, but I think if you go over the reports carefully, and especially those that you were given here today, you will see that, yes, the New York Bight hasn't been adequately modeled, that is, we can't

weight these factors, but we can make some pretty good guesses about what has occurred. And to suggest that a nutrient loading or the addition of a great deal of particular organic material in this area is not important, that, in my opinion, is ridiculous.

When we talk about the quantity of materials, you have to remember that it is not just how much is being done, but it is how the stuff is distributed, how long does it remain suspended in the water? Which way are the water currents going? What are the actual concentrations at the dump site or as we move away from the site? We may suppose that the ceratium bloom started at the edge of the Continental Shelf. That doesn't necessarily validate the argument that nutrient levels have nothing to do with it.

Dr. Swanson's comments here today have not been reviewed by his colleagues in the scientific community. Let me suggest to you one report on Environmental Modeling that may have escaped you, Batel-Northwest has reviewed this sort of modeling and they have given a pretty good evaluation on it, a report that I believe came out last February. These models coming out of Stony Brook provide the rationale for what we call a no-action policy, and I think legislators ought to see them in perspective. They are not the best evidence from the scientific community. It is not "the best possible evidence"- the term that we see cropping up again. Many people in the EPA and International Marine Fishery Service - and I don't know many people in the MESA Project group---

SENATOR PARKER: MESA Project group, what do you mean by that?

MR. RAUSH: Well, that is a special group in NOAA that has been set up to handle this environmental modeling. Many of the scientists there would concur to almost everything I have said here. So when the Director of EPA in some region, or when some other high government official comes and gives testimony, that can't be taken to mean that every scientist in this organization agrees with that testimony.

SENATOR PARKER: I can tell you that the guy from the National Marines Fisheries, who I guess is under him, told us that he thought it was directly related to the nutrient level, and he gave us the figures. Now, that is my recollection. Joe, who was the fellow from Sandy Hook?

MR. RAUSH: Was it Steimle?

SENATOR PARKER: His name started with "S."

MR. RAUSH: Maybe it was Dr. Merrill. He is a Resource Assessment person there. But that is the point I am trying to make. An organization can have some official stand for a variety of reasons, not necessarily scientific reasons, and the scientists who are in that organization don't necessarily agree with it. And there is some pending litigation here that could be a possible reason for these unusual pronouncements, but they by no means represent any kind of consensus that I know about in the scientific community, so I am saying, don't be misled by them.

SENATOR PARKER: Well, we don't want to be, and I think it is ridiculous to think that with all this expertise something can't be done. I am convinced that a political decision has to be made on this, as opposed to a scientific decision. I don't know whether Joe is or some of the other members are, but I am convinced that if we don't hold their feet to the fire and make some affirmative move that what you are saying is going to in fact result; and that is, we are going to have nothing.

I have seen no movement by Dr. Paulson or our DEP. They have promulgated water standards for the pineiands, which I understand nobody can live with. Now, that is only what I have heard. They are having hearings now, and they have promulgated no standards for anywhere else, and we have no where to go. What do you want us to do? I don't understand this. I really don't understand this. There is going to be a revolution. You are talking about survival; you are going to need survival if something isn't done and it happens again this year, with all the rateables, with all the values along the coast, with all the industry - not only the fishing and the clamming and the rest of it, which has been destroyed.

How I initially got into this was representing the fishermen on the kepone problem and also the sludge sediment. I don't even see any of them here today. Most of them are so disenchanted with the lack of any action, that I guess they didn't feel it was worthwhile coming.

MR. RAUSH: Well, it is unfortunate that it has gotten to this state, but I would say, from what I have seen, that is true. I have not been in New Jersey for twenty years. I came back on vacation that I had planned for a long time, and I got a house on the beach in Lavallette, and my first bout with the ocean was an unhappy experience. Now, I don't know whether DEP recorded that material coming in on the beach or not, but right after, two days after the hurricane we had in August, we had a big problem on the Lavallette Beach. It took about a week and a half for everything to clear up.

Now, people are going to get wise to that sooner or later. If that happens this summer, or two or three years in a row, they don't have to come to the Jersey Shore. They can go to Maryland or Virginia or some other place that doesn't present this problem during vacation time. So we don't want outlandish action; we don't want you to run through the streets yelling "Back to nature." But we do want some substantial action now.

I think Dr. Paulson's assessment of the situation that I heard here today was reasonable. We are disappointed, though, that DEP is coming out with what we interpret as, "Yes, let's move the sludge dumping site, but let's not do it for two years." Now, that doesn't make a heck of a lot of sense to us.

SENATOR PARKER: No, it doesn't to me either, because we can do the same thing. We can force the issue, and it is a political issue. Really, the pineland issue is also political. They have set standards. We can accept, without a scientific basis, as I understand it, any real determination. And we can set the same standards for the whole State of New Jersey and cut out the runoff problem. We can stop at least our people from dumping and force them into the landfill immediately. I don't know that moving it 200 miles off shore is correct either, but I firmly believe that some political action has to be taken, because I am convinced - in all due respect to Dr. Paulson and the others - that we are going to continue get--- It is just like putting two doctors in the room with two lawyers, and they will have a divergence of opinion on the same subject. The only problem is that they are trying to develop the situation into what is scientifically the best answer and the most appropriate answer.

It is going to be impossible, really, for them to accomplish this without a political decision from us. I know that this is what is going to happen.

MR. RAUSH: Senator Parker, let me just say why it is that we are going for something that seems to fly in the face of environmental reasons.

This 106 mile move will, as we heard here today, be no more costly than the operating cost of composting. So, therefore, we can't say let's not do it because that money would be better spent in gearing up to do something else, number one. Number two, the site is already environmentally damaged. The EPA did demand that Dupont dump at 106 miles because there was methyl alcohol in what they were dumping. I think you were clearly getting at that.

Number two, there are fish in the area, but there are not great concentrations. The water calm is relatively deep. The currents tend to send this material further off shore. We are not dumping it in thirty-foot water as we are now, or forty-foot, or very shallow water, where the current can send this material up on shore. Sure it would be better not to have to come up with that additional money, and there may be some international reasons why this is not going to make the good old USA look as good as we want it to, but we have to think of people right here in New Jersey, people who have spent their lives here in the vacation business, in the fishing business, and a host of other businesses. We think that what we are advocating is economically sound.

Our reasons are dollar reasons. We are not talking about creating a pristeen environment or returning to nature or anything like that. We do appreciate these arguments. But our reasons are strictly economic reasons.

SENATOR PARKER: We can't do anything about that. That is the EPA. Maybe I will change my opinion on that. But I think we can do something here locally by forcing one of these bills out of committee.

MR. RAUSH: We are especially interested in seeing that bond issue come through, certainly.

SENATOR MC GAHN: Doctor, you said that politically we did nothing. Look at the situation in the State. You said that we should do something. Assume that you could take and barge the sludge out to 106 miles tomorrow. Could you give an absolute guarantee that there would be no more---

MR. RAUSH: No, absolutely not.

SENATOR MC GAHN: Now, you put yourself in the same position as some of the others who testified today. I would also like to---

MR. RAUSH: Well, let me just respond to that in a little greater detail. We are dealing with living systems. They are very complex. Because there are no guarantees, that doesn't make it not a good idea to do something. We are using language, and we want everything to be done to minimize the problem of the bloom. We do not agree with suggestions that 5% of the problem comes from the sludge dump at the Apex of the New York Bight. We are saying that this has not been modeled at all, and we don't know what percent to stick on it. It may very well be 100% or 90%, or whatever. I have seen no evidence to suggest that 5% of the problem is related to sludge dumping.

SENATOR MC GAHN: Do you have evidence that the 5% is absolutely wrong?

MR. RAUSH: Absolutely any number that we would put on it is absolutely wrong. Besides, there are no confidence limits. Commander Swanson said there is no statistical evidence to show that sludge dumping had anything to do with the algae bloom. Well, of course not, because his models are not statistically sound. There is no statistical evidence to show that it didn't have anything to do with it either. These models do not lend themselves to statistical treatment, so his testimony, in my opinion, was a concerted and studied attempt to fool the committee, and when Dr. O'Connor came down and testified at this

institution about a month and a half or two months ago, his testimony was pretty much the same. Except, he said, yes, we want a clean environment, and, yes, our model does come up to statistical evaluations, which was completely false. And this comment was made in front of Mr. Stipel and myself, and Mr. Thomas from Sandy Hook, the National Marine Fisheries Service there.

I am not speaking through my hat, believe me. I can't really guess with any degree of assurance why they are taking this stand, but I can tell you that it certainly doesn't amount to a position that is any more scientifically sound than one that you can come up with or I can come up with, or this young lady that is doing the transcript could come up with. This is not the way that scientific evidence is treated, and these comments should not be taken as the comments of scientists. They should be taken as the comments of various governmental agencies. I dare say that some of the comments that I wrote down here as quotations from Dr. Swanson's testimony he wouldn't want published in any article in any scientific journal. I would certainly be very much surprised if he did. It is not scientific testimony. Thank you for listening to me.

SENATOR MC GAHN: Mr. Bogan.

D A V I D B R A M H A L L: Good afternoon. I guess I am the last witness. Captain Bogan couldn't be here today. He is out fishing. I am David Bramhall. I am a charter boat operator in Brielle, and along with Captain Bogan, I represent the United Boatmen of New York and New Jersey. We seem to be the only people here today who are representing an industry that has actually been hurt by this pollution. Immediately we come to an area in which we have been, that is, the fish kill, which has been related to us in varying degrees, whether you want to say that the sludge dumping and the dredge spoils and so forth and so on was the 100% cause for the fish kill, or whether it was a 5% cause, or whatever, certainly it has hurt us. In fact, last year, by our estimates, we believe that our industry suffered losses of between 50% and 70% below what we should have done during the year.

Also, the problem which has not been addressed today is that in the area in which the dumping occurs has become the dead sea area. It has become a cesspool off shore. And this area was once a prolific fishing grounds, which it is no longer. No one has addressed the issue as to what we are to do with this, whether it is to be continued to be further raped and destroyed, or whether it is to be at all reclaimed. So we are hurt on two scores on this.

As I sat here all day, one question keeps coming to my mind. It is a rhetorical question, and that is, if the Atlantic Ocean was not here, what would we have done with our sludge, with our dredge spoils and so forth? Certainly other places in this world have had this problem. What do they do in Omaha, Nebraska, for instance? They must do something with it. Beyond our municipalities and our Corps of Engineers, I was interested in the Dupont statement, what they are doing, and how they are studying it and so forth, but I wonder what they do at their other plants. Certainly they must do something with their residuals at their plants which are not located by the coast.

It seems that because the ocean is here, it is readily available, and it is cheap, and therefore it is used. Most of the people who have testified here today have not been hurt by the dumping. We have - and in varying degrees. We

seem to feel that we have been hurt to a very large extent. Now, you may differ with us, and the so-called experts may differ with us, but we seem to have at least our own gut reaction that we have been hurt to a very large extent.

Now, as such, we see first an immediate need which must be dealt with, and that is, we feel that dumping at the 12 mile site should end immediately. And we feel that this was a contributing factor to the fish kill. We are not sure that the scientific evidence has not be weighed and read in a matter to come out to that conclusions that were previously expected or desired, and further, we also feel that any continued dumping would continue the problem of this dead sea area which we have. Beyond that, we feel that in the long term, all ocean dumping must be ended. It never should have began, but now it has, and it has been continued. The policy should be phased out as quickly as possible.

To deal with the immediate need, we believe that the dump site should be moved to the 106 mile area. Now, there seems to be quite a bit of controversy on that. We read this DEP report with the Commissioner's conclusions and recommendations of the staff report, and he has a table in here in which he discussed the environmental pros and cons of the 106 mile site, and I gather unless they receive additional information, at this point the tables seem very conclusive that we should move it out there, and our general sense, or our non-scientific study of it, or our gut feelings, I should say, would seem to indicate that it should be moved out there. It is off shore of migratory patterns of all the fish which are important to this area, specifically the blue fish, which migrate well in-shore, in fact. The ones that come in here and even the ones that go up to New England migrate in shore of the 106 mile area. The fluke or the summer flounder migrate out to the Shelf, well on shore of the 106 mile area, and certainly the other fish, if we wanted to consider them all, we would see that the 106 mile area is well off shore of their migratory routes.

SENATOR PARKER: Is that true for the tuna fish and the Blue fish and the sword fish?

MR. BRAMHALL: The blue fish, certainly. There was a study in which I participated, done by a fellow up at Sandy Hook, which mapped the blue fish migration---

SENATOR PARKER: Blue fish don't usually get that far off shore. Fifty miles, maybe at the most.

MR. BRAMHALL: Well, there are three bodies of blue fish which migrate up the coast, one which never comes in shore closer than fifty miles. We never catch those fish, or rarely, I presume. But those fish do migrate in shore of the edge of the Continental Shelf. The other populations of them migrate well in shore of a fifty-mile area.

SENATOR PARKER: Your tuna fish, marlin, and sword fish all migrate well off shore and go well out of the 100 miles.

MR. BRAMHALL: Well, if you are dumping at 106, you are going down at depths well below which you can expect the tuna fish and the marlin to go to.

SENATOR PARKER: But you have all the creatures of the shelf coming up, which are all your lobster, your tile fish and everything else coming up.

MR. BRAMHALL: Well---

SENATOR PARKER: And you are not going to affect them right at the very source, to keep them from coming all the way.

MR. BRAMHALL: The one questionable fish would be the lobster, which we don't really have any expertise on. The other ones are the creatures of the Shelf, as you say, and the 106 mile dump site area is off the Shelf, at least by where it is drawn on the map it is. It is considered way off the Shelf.

SENATOR PARKER: Well, the Shelf comes in, and you come into the New York Bight there.

MR. BRAMHALL: Well, right behind you on that chart there, the brown "X" indicates the 106-mile dump area. You can see that Hudson County, and up to the northwest of it, and a hundred fathom curve going with it.

SENATOR PARKER: Thank you.

MR. BRAMHALL: Beyond that, and obviously there is going to be much debate on the 106 mile area, and I think a lot of it depends on how you read the information which is given to you.

SENATOR PARKER: You understand that we don't control that.

MR. BRAMHALL: Right. We would only hope that you would recommend that or favor it, but we realize that you have no legal capability to move it out there. But immediately, more important than that, we felt action must be taken to make sure that municipalities and other agencies which do dump under your jurisdiction do not wait until 1981 to try to come up with a program to eliminate off shore dumping. In other words, we feel that we must have action as soon as possible, otherwise you will see people in 1981 saying, well, we don't have anything to do.

We have seen this go on with many other things, where people have dragged their feet, and when the time came, they got a postponement. Last summer at the height of the fish kill, our intelligence was insulted. When we listened to the television, we saw the city EPA Director say that there are no technological solutions to the sludge problem. And furthermore, where do we get the money, they would say. But this was repeated time and time again, and we just don't buy that, and we don't believe you people do either.

Specifically, with what has been discussed this afternoon and this morning, the bill we most favor is Assemblyman Villane's bill, Assembly 2320. We feel, as you have used the term time and time again, their feet must be put to the fire, and people must be pushed up against the wall. And we feel that there must be a deadline put down which should be at least attempted to be adhered to. That is about all I have to say.

SENATOR PARKER: I am sorry more of the fishermen and the boatmen couldn't get here today. We put notices in the paper to try to get them to be here.

MR. BRAMHALL: It has been a very frustrating winter. It seems that we have a meeting a week to go to, and we have other responsibilities too. It is a horrible time to have to hold a hearing for us, in the middle of the day. And we have been pressed on both sides, with the 200 mile limit, and some foolishness by the Fish and Game Commission to push for a salt water fishing license.

SENATOR PARKER: That is to get federal funds.

MR. BRAMHALL: No, that is to get state funds.

SENATOR PARKER: Well, to get state funds, in order to get the Thingle-Johnson matching funds, which come from the sale of licenses and salt water equipment. We are one of the few states that don't have that.

MR. BRAMHALL: Some of us were at a meeting not too long ago, and we were told that there was a study conducted by Eagleton, funded by the Fish and Game Commission to study ways of alternate financing for the Fish and Game Commission.

And they spent \$7,000 to try to get us to agree that we should have a salt water fishing license.

SENATOR PARKER: All we need to do is appropriate the money for fish and game.

MR. BRAMHALL: Well, they don't feel you will, and they don't honestly have any viable alternatives or solutions as to what they are going to do with their money. They don't have anything, really, they could do in the salt water field, other than go around and study sludge dumping, and we certainly all know that the sludge is being dumped.

SENATOR MC GAHN: Thank you very much. We appreciated everybody's testimony today. I think, as you know, we cannot take any action, as far as we are concerned, on the 106 mile limit. But I think you are fully cognizant of the fact that Commissioner Bardin testified in favor of it, so, therefore, that represents the policy of the Byrne Administration. I think, as Senator Parker said, we are not as a Committee particularly prone to act strictly on scientific or so-called scientific evidence.

The action of this Committee will be of a political nature to do what we feel has to be done for the people of New Jersey. The record will remain open for two weeks. Anyone wishing to send a written statement to us can submit that to Mr. David Mattek in the State House, in care of the Senate Committee on Agriculture and the Environment. Thank you.

* * * * *

(Hearing concluded)

Testimony of Dr. Glenn Paulson
Assistant Commissioner of the
New Jersey Department of
Environmental Protection before
Senate Energy and Environment
Committee and Assembly Agriculture
and Environment Committee of the
New Jersey Legislature

March 16, 1977

Ocean County College

Chairmen Russo and Stewart, members of the Legislature, ladies and gentlemen. My name is Glenn Paulson; I am the Assistant Commissioner for Science in the New Jersey Department of Environmental Protection (DEP). I appear here today in response to an invitation to Environmental Commissioner David J. Bardin to present DEP's testimony on solutions to the problems of ocean pollution.

We welcome the continued interest of members of the Legislature in the problems of pollution of the ocean off New Jersey and the rivers and bays that empty into it. Your Committees, both through hearings and through distribution of reports prepared for your use by DEP, have done much to inform not only the legislature but the public at large.

The specific goal of today's hearing is to discuss solutions to problems rather than the problems themselves. That will be the basic thrust of my testimony.

Solutions for the complex problems related to pollution of the ocean must be reviewed with an understanding of current legal restraints and potential economic and social effects, as well as the current uncertainties in scientific information and engineering ability. Therefore I would like to briefly discuss all these areas.

The Issue of Federal Pre-emption

Several courts, including the U. S. Supreme Court, have ruled that for the East Coast states in general, and New Jersey in particular, state jurisdiction over a wide variety of activities conducted in the ocean ends at the three mile limit. For ocean dumping, Congress has adopted strong pre-emptive language: Title I of the federal Marine Protection Research and Sanctuaries Act of 1972 (Public Law 92-532, often termed the "ocean dumping

law") states, in part:

"After the effective date of this title, no State shall adopt or enforce any rule or regulation related to any activity regulated by this title." (Sect. 106 (d)).

The Attorney General's office and DEP lawyers have both advised me that this is very strong pre-emptive language, and may effectively preclude the State from any direct regulatory role, not only in activities conducted beyond the three-mile limit, but even for many activities conducted within the three-mile limit. A strong state role may well have been envisioned by the State legislature when in 1971 (before the passage of the federal law), the Legislature passed the state's Clean Ocean Act (Title 58:10-23.25, et seq.)

This is not to say the State has no role whatsoever. Within the three mile limit, for example, state authority over actual dumping activities might well be paramount. However, as a practical matter, we are not aware of any regular dumping of sludge, construction debris, chemical wastes or other material from vessels within the three mile limit. Arguably, on-land activities needed in the waste disposal process could be regulated by the State (such as loading of vessels), as is proposed in some of the legislation before you. However, based on DEP's analysis, this possibility deserves a thorough legal review to avoid wasted or duplicative effort by any state legislative or executive agency.

Role of Other States

It is not only New Jersey sewage authorities and industries that dump wastes in the ocean off New Jersey. Cities and industries in New York and Pennsylvania also produce wastes of various sorts that are loaded onto vessels and then dumped into the ocean. The New Jersey Assembly has recognized the regional nature of this problem through the "Intra-Legislative Investigatory Committee on the Pollution of the Coastal Waters of New York and New Jersey" (otherwise known as the "Joint Committee") that it established last year with its counterpart in New York State. New Jersey's delegation, led by Assemblyman Villane, is joining with the New York delegation for public hearings tomorrow at Sandy Hook, I believe.

The main lesson here is that while New Jersey should and is moving to reduce its dumping of wastes into the ocean, major inroads into the problem will only be accomplished if these other states move ahead as well.

Costs of Ending Ocean Dumping

An important element to be considered in relation to ending ocean

dumping is the cost that would be involved. These costs would be both public and private. The public costs have been analyzed in DEP's January report on ocean dumping of sludge (attached). You have previously received copies of this report which discussed, among other topics, the estimated cost of land-based sludge disposal methods in detail.

None of these costs are trivial. Without question, there would be an increase in costs for the users of sewage treatment systems if the so-called "106 mile site" is used for dumping instead of the present "12 mile site". (See map on page 21 of the attached report.) DEP has estimated that for New Jersey's six largest sewer authorities, the dumping cost per wet ton of sludge in 1978 would be \$1.75 at the 12 mile site, as compared to \$7.50 at the 106 mile site. Next, if we look at the economics of land-based alternatives to ocean dumping, in particular, composting and pyrolysis, DEP's estimates for 1978 are \$5.30 per wet ton for composting and \$18.00 per wet ton for pyrolysis. However, under current practices, part of the costs to sewage authorities of these alternatives would be paid for by federal and state grants, therefore reducing the direct cost to the sewage authority (and its customers).

Industrial wastes dumped in the ocean are also being reduced by the U. S. Environmental Protection Agency's (EPA) activities under the ocean dumping law. Any costs companies incur as a result of ending ocean dumping and implementing land-based alternatives eventually will be borne by the buyer of the companies' products. We have no firm estimates of these costs as yet.

S. 1808, which calls for a \$100 million bond issue, recognizes that funds will be needed to construct alternative sludge facilities. However, as pointed out earlier, alternative sludge handling techniques will be eligible for federal funding of 75% of their capital costs. Presently, work is underway which would allow an estimate of what will be the total costs (and the federal and state/local shares) for various sludge handling alternatives for sewage facilities throughout the entire state. Thus, while we welcome your recognition that funds will be necessary, we recommend that the legislature hold this idea in abeyance until more definitive judgments on dollar costs can be made.

S. 1804 would also provide funding for the development of alternative methods to replace ocean dumping. The bill calls for an increasing fee schedule for loading of vessels in the state; the monies generated from this fee schedule would create a "Clean Ocean Fund" to be used to develop alternatives to ocean

dumping, and to clean up materials that cause damage. The proposed fees are \$1.00 per cubic yard, with a yearly increase of \$1.00. Since the estimated cost of ocean dumping in 1978 at the current 12-mile site is about \$1.45 per cubic yard, this is indeed a healthy economic incentive. The sludge produced in New Jersey in 1975, if so taxed, would produce \$2.1 million the first year, \$4.2 million the second, \$6.3 million the third, and so on. This might allow a more rapid shift to composting.

Need for Flexibility

I also would like to stress the need for flexibility in the tools, timetables and solutions developed to deal with ocean pollution. A complex set of elements has contributed to the present pollution of our ocean waters; any action should recognize the inherent complexity of dealing with this complex situation.

Landfills may be Generally Unsuitable for Sludge Disposal

The goal of completely ending the ocean dumping of sludge in a very short period of time, as expressed in two of the bills before you today, is a good goal. However, the realities of the problem will make such a goal very difficult.

Both S.1659 and A.2320 propose to completely end the ocean dumping of sludge, the former by January 1, 1977, the latter within a year of the effective date of the act. While we applaud the goal, we believe both pieces of legislation are unworkable as they now stand. First, there is the issue of federal pre-emption mentioned earlier. Second, the only quick alternative, as both bills recognize, is the use of landfills. We believe this technique is undesirable. Sludge can contain toxic heavy metals, harmful bacteria, and other hazardous agents as well as high levels of organic matter which can badly pollute both ground and surface waters. The disposal of sludge in unsealed landfills (typical for those in New Jersey) would pose a direct threat to human health, to our ground waters, and to aquatic life in our streams, rivers and bays. Although A.2320 calls for continued monitoring of landfills accepting sewage sludge, this is not adequate to prevent contamination.

Regionalization of Sludge Management

A common provision in three bills to regionalize sludge treatment is in complete accord with our thinking. In fact, under our urging, the municipalities of Trenton, Hamilton, Ewing and Lawrence have recently agreed to undertake an analysis of alternative sludge handling techniques that may be suitable for that particular region.

A.2357 calls for the regionalization of sludge management through integration with the regional solid waste planning and management process which is already provided for in the recently enacted Solid Waste Management Act. While endorsing the general concept, we do not believe that sludge management should be tied to the county-oriented planning mechanism in the solid waste act. Sludge generation does not follow county lines, but rather sewer lines (and, more generally, population distribution). The on-going work by DEP and the state's sewage authorities should provide later this year the information needed for defining regionalization.

Pretreatment

We welcome your recognition of the importance of establishing pretreatment requirements. This is both a much-needed and difficult goal; EPA itself has found it difficult to develop a coherent approach to this problem.

Lessons from the Fishkill

The Committees are aware that there were various contributing factors to the algal bloom last summer. The question before us today concerns the proportion of the problem attributable to each of these factors and the most effective solution for dealing with each factor.

Scientific review of last summer's algal bloom and the subsequent fishkill is still underway. The event was brought about by a combination of unusual physical conditions and an over-fertilized ocean. In DEP's October 7th report to Senator Russo's Committee, we analyzed the basic causes of ocean pollution in the Atlantic coastal area. The pollution of these waters is due to both man-made and natural sources. Man-made sources include domestic and industrial wastes, sludge, chemicals, dredge spoils, and rubble dumping, as well as urban run-off. Natural sources would include atmospheric fall-out and non-urban runoff. (Non-urban runoff is not strictly natural since man's activities indirectly influence the levels of the pollutants in nonurban areas). The October DEP report analyzes and explains the magnitude of various pollutants contributing to the overall pollution of the ocean. (See Tables on pages 10 and 11 of the October 7th report).

Tables in that report illustrate the relative importance of different sources contributing to overall pollution levels discharged into the ocean. They show that, in terms of total loads, sludge contributes less pollution than urban runoff and dredge spoils, though that does not mean that sludge should be ignored. Although the dumping of sludge and dredge spoils off New Jersey is responsible for 19% of the regional inorganic

nitrogen load and 50% of the total phosphorous load. However, until the relationship between nutrient input and algal blooms is better understood, it is not possible to quantitatively distinguish the impact of sludge and dredge spoils dumping from other important nutrient sources such as domestic wastewater. However, it is important to recognize that sludge is only part of the problem, not the entire problem.

Another aspect of the factors contributing to the algal bloom was the unusual physical condition of the ocean. From late spring through summer, the ocean's surface is warmed by the sun while the bottom layers remain relatively cold. A transition zone, the thermocline, develops between the two. Due to the absence of major storms and the warm and sunny weather, last summer's thermocline was especially strong, and very little mixing took place between the warm and cold layers. This also contributed to low oxygen levels on the bottom of the ocean.

Various solutions have been proposed to combat the increasing problem of ocean pollution, and, in particular, the ocean dumping of sludge.

Sludge

As pointed out earlier, the immediate ending of ocean dumping of sludge is not feasible. DEP's January report contains Commissioner Bardin's conclusions and recommendations on ocean dumping of sludge and land-based alternatives to ocean dumping. Commissioner Bardin has recommended to EPA that the long-term solution should take the form of professionally tested, environmentally safe and economically sound sludge management, and has strongly endorsed the 1981 deadline for implementing acceptable land disposal alternatives. Dumping sludge at the 106-mile site may be the most feasible short-term action at this point, but it should be used only as an interim step. DEP has recommended a gradual shift to the 106-mile site, contingent on: (1) full compliance with the National Environmental Policy Act, (2) federal monitoring of the site to determine the effect of dumping, (3) realistic assessment of barging capacity and costs, and, (4) a timetable to allow advance budgeting by sewer authorities.

Dredge Spoils

In 1975, 13,600,000 cubic yards of dredge spoils were dumped at various locations in the North Atlantic region. Approximately 640,000 cubic yards came from New Jersey waterways. The impact of both dredging and the disposal of the dredged material is at present not well understood. Based on the fragmentary data already

available, we know that the impact will vary with the nature and chemical composition of the sediments being disturbed.

Responsibility for authorizing the transport and dumping of dredged materials rests jointly with the Corps of Engineers and EPA. The Corps which, by far, dumps the major portion of the dredge spoils, has begun a \$30 million research program to evaluate the impact of dredging and the disposal of dredged materials and to develop technically feasible and environmentally and economically acceptable alternatives to dumping. Unfortunately, this five-year program was started only two years ago. Thus, we must wait until this research is completed before we can recommend to you a course of action suitable for New Jersey's problems.

Wastewater Effluent

To deal with this source of pollution, we need to complete our sewer program whose main goal is to protect our bays and rivers. Further research in this area may show the need to go to more advanced wastewater treatment, but we are not making that recommendation yet.

Other Sources

There are many other sources of ocean pollution. They include agricultural wastes, atmospheric fallout and urban or stormwater runoff. This is another area that is poorly understood, but it is now being studied. Although solutions to the problem posed by stormwater runoff and other diffuse ("non-point") sources are not yet clearly defined, on-going area-wide water pollution studies will contribute to the understanding of this complex source of pollution of New Jersey's streams, bays and ocean. Costs here also may be substantial. According to DEP estimates, just the steps necessary to control organic pollution from stormwater runoff in New Jersey would cost roughly \$8 billion.

In closing, DEP welcomes your continued interest in the critical issue of the contamination of the ocean. We look forward to working with you to forge effective solutions that will benefit the ecological health of the ocean and its creatures and thus benefit those of us whose livelihood and recreation depends on a healthy marine ecosystem.



STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DAVID J. BARDIN, COMMISSIONER

OCEAN DUMPING OF SLUDGE - PROGRAM THROUGH
PHASE OUT IN 1981

Commissioner's Conclusions and Recommendations
Staff Report

January 24, 1977



STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DAVID J. BARDIN, COMMISSIONER
P. O. BOX 1390
TRENTON, N. J. 08625
609-292-2885

January 24, 1977

Hon. Gerald M. Hansler
Regional Administrator
Environmental Protection Agency
26 Federal Plaza
New York, New York 10007

Dear Mr. Hansler:

You have requested our further opinion on the ocean dumping of sewage sludge. You specifically inquire about possibly shifting the present 12-mile sewage sludge dump site either to one of the 60-mile sites studied by your Agency or to the 106-mile chemical dump site off the edge of the continental shelf.

The federal EPA has plenary jurisdiction over ocean dumping; the decisions will be EPA's to make. New Jersey appreciates that in exercising your federal statutory responsibilities you have consulted with the State both formally and by means of continuing discussions with our professional staff experts over the last few weeks.

I transmit for your consideration my Department's report on the ocean dumping of sludge and on land-based alternatives to ocean dumping of sludge. Having reviewed that full report, the following are my conclusions and recommendations:

Basic Considerations

1. The present system of ocean dumping should not be perpetuated. If EPA decides to shift the dump site for some or all of the sewage sludge, that decision should clearly be an interim step. Avoid any "out-of-sight, out-of-mind" reaction. The deadline (December 31, 1981) for implementing acceptable land disposal alternatives should not be extended.

2. The long term solution must take the form of professionally tested, environmentally safe and economically sound sludge management. The present system of ocean dumping is but one example of poor management of sewage sludge.

Hon. Gerald M. Hansler
January 24, 1977
Page 2.

There are others involving incineration, landfill disposal, and direct application to land. Poor management of sludge threatens not only the ocean environment, but groundwaters, air quality, good agricultural practice and other vital activities. In some cases, the best management of sewage sludge will probably require pre-treatment of industrial effluents before they enter municipal sewage systems. New Jersey is manifesting its commitment to effective and responsible sludge management solutions by establishing a professional office of sludge management and pre-treatment, in the Office of the Director of Water Resources and with state-wide responsibilities.

Conclusions

3. In my judgment, the only hope for meeting the 1981 deadline for an acceptable substitute for ocean dumping lies in widespread composting in both New York and New Jersey, at least as an interim measure. We in New Jersey will move just as quickly as responsibly may be done toward that end.

Composting seems the simplest, cheapest land disposal alternative that could be acceptable in New Jersey. But even composting will require from one to four years for design and installation of de-watering equipment. (Sludge contains only 3-6% solids as produced in the treatment plants; optimal composting is with 23% solid sludge).

EPA has compelled the City of Camden to dump at the 106-mile site until its composting facility is ready (later this year). EPA has yet to crack down similarly on the City of Philadelphia which dumps 35 miles off Maryland.

4. Any interim shift of ocean dumping to a site beyond the present 12-mile site will be costly to the sewer authorities involved and their users. If EPA concludes that such a shift should be required, it must be on a non-discriminatory basis imposed on New York City (which is the principal ocean dumper by far) and Philadelphia, as well as New Jersey sewer authorities.

Costs to sewer authorities and users

A shift of all sludge dumping to the 106-mile site would impose substantial new costs on New York City and the lesser ocean dumping authorities in New Jersey and

New York. We estimate the 1978 budget impact of such a shift (and offer the total 1975 budget for comparison) in the cases of the largest affected New Jersey authorities:

<u>Authority</u>	<u>Increase in 1978 budget to dump exclusively at 106- mile site</u>	<u>Total 1975 budget</u>
Passaic Valley SC	\$3,277,000	\$9,003,000
Middlesex County SA	1,903,000	4,825,000
Bergen County SA	1,598,000	9,195,000
Joint Meeting, Essex & Union	667,000	599,000
Rahway Valley SA	632,000	2,612,000
Linden-Roselle SA	161,000	515,000

Wholly apart from regional growth, sludge quantities will increase as secondary treatment plants go into service over the next few years. (We expect the ocean-dumping sewer authorities in New York and New Jersey to double sludge output between 1973 and 1981.)

New Jersey authorities generally pass increased costs on to member municipalities in proportion to gallonage received. If homes and industries also paid on a gallonage basis, we would expect affected North Jersey households to pay between \$3.75 and \$9.50 more per year for sewer service if sludge dumping were shifted to the 106-mile site. In most cases today, however, municipalities pass along their share of new sewage costs in the property tax (since few have yet adopted user charges based on gallonage). If reflected via the property tax, such increased ocean-dumping costs might look as follows in five of the municipalities affected:

<u>Municipality</u>	<u>Increase in 1978 municipal budget</u>	<u>Increased tax on home assessed at \$10,000</u>
Newark	\$1,191,000	\$11.00
Paterson	501,000	8.10
Harrison	71,000	8.00
Englewood City	57,000	2.30
Paramus	52,000	0.60

5. We believe that sludge dumping was one of the inter-related, indirect causes of last summer's ecological tragedy: the vast algal bloom followed by smothering of the ocean bottom and extensive kill of benthic organisms. We have not been able to determine the source of floatables and trash that washed up on the beaches of New Jersey and Long Island and cannot point to sewage sludge dumping as the source of those materials.

Effects of sludge on the Ocean

Plant nutrients, containing nitrogen and phosphorus, were probably one of the factors that prompted last summer's massive algal bloom and subsequent fishkill over 3,000 square miles of the continental shelf. (Another factor was the unusually high proportion of sunshine.) Sludge was one of the sources of plant nutrients, but there were several other sources.

Sludge dumped at the 106-mile site would be far less likely to "fertilize" the algal bloom area than sludge dumped at 12-miles. We should end the 12-mile dumping as soon as feasible alternatives can be ready. But that step will only tend to clean-up the Ocean; it will not work magic:

--A massive algal bloom could recur anyhow, because of plant nutrients accumulated over the years and supplemented from non-sludge sources. (The latter add 8 to 10 times as much plant nutrient to the Ocean each year as does sludge.)

--Or, more cloudiness and less sunshine might mean no algal bloom even if sludge dumping continued and increased at the 12-mile site.

Moreover, dumping sludge at 106-miles carries its own risks to that area about which we know little. Nonetheless, moving at least some sludge out to the edge of the continental shelf (or beyond) offers one of the few short-term actions available to EPA. Other, more permanent, measures will probably take longer to implement on a large scale.

6. The federal disinterest in the oceans has left dreadful information gaps as to pollution mechanisms, ocean currents, distribution of dumped materials and the effects of alternate actions. As Russell Train, you and I agree there must be a far greater federally-funded effort by NOAA (the National Oceanic and Atmospheric Agency in the U. S. Department of Commerce). I estimate a FY 78 federal budget need of \$2-3 million for monitoring dumping of sewage sludge off New Jersey.

7. A shift of sludge dumping to the 60-mile site would plainly do no good since these sites are within the 3,000 square mile impact area of last summer's disastrous algal bloom.

8. A shift to the 106-mile site, or even beyond, might well reduce the likelihood of recurrence of such a bloom, as explained above. Such a major federal action should not be undertaken, however, except in full compliance with NEPA (the National Environmental Policy Act). Moreover, NOAA should undertake to monitor the 106-mile site at federal expense.

9. Before mandating a shift to the 106-mile site EPA should realistically assess how much barging capacity presently exists, the cost of using that capacity, the cost of securing new capacity and the wisdom of the last step.

We believe present barging capacity could handle a shift of some, but not all, of today's dumped sludge to the 106-mile site. More vessels could be built or bought at a price. There are probably alternative transportation uses for the barges.

10. If EPA mandates a shift to the 106-mile site, it should do so under a responsible timetable that allows advance budgeting by the sewer authorities. New Jersey authorities budget on a calendar year basis. Therefore, the extra costs should not be imposed upon them before calendar year 1978 at the earliest.

11. Our best estimates of the cost to the sewer authorities of a shift to the 106-mile site would bring the cost of ocean dumping well above the cost of any land-disposal alternative and to almost double the cost of composting (which appears to be the cheapest and simplest acceptable land-disposal method for New Jersey). Thus a shift to the 106-mile site would dramatically reverse the ocean-to-land cost comparison.

Ocean dumping at the near-in sites is now cheaper for the sewer authorities than land disposal. A shift to the 106-mile site would reverse the relationship: Composting would cut the 106-mile-site dumping cost almost in half. Even capital-intensive pyrolysis could cost the authorities somewhat less -- assuming federal grants of 75% of construction costs -- since the authorities bear all costs of ocean dumping as operating expenses without benefit of federal aid.

12. If EPA leaves it up to each sewer authority, they will predictably dump at near-in sites just as long as possible. Indeed, shifting New York City or Philadelphia to the 106-mile site may be the only way to compel real progress to land disposal alternatives. On the other hand, the short-term environmental benefits are not sufficiently compelling or certain to justify a panicky decision.

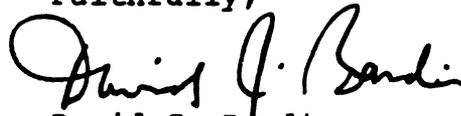
Recommendations

I recommend a gradual shift to the 106-mile site, so long as EPA does not discriminate against New Jersey authorities (by favoring New York and Philadelphia) and so long as EPA does its homework, including:

- full compliance with NEPA (the national environmental policy act) as to the 106-mile site;
- federal monitoring of that site to determine currents, conditions and effects of dumping (NOAA in the U. S. Commerce Department is the appropriate agency);
- realistic assessment of barging capacity and costs;
- a timetable to allow advance budgeting by the sewer authorities. (In New Jersey that means the calendar year 1978 budget or later).

The shift to the 106-mile site should be phased to coordinate with the progress expected of each authority toward land disposal. The overall goals should be tangible, steady progress to reduce and then eliminate ocean dumping of sludge.

Faithfully,



David J. Bardin
Commissioner

Enclosure



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REPORT ON THE OCEAN DUMPING OF SLUDGE
AND ON LAND-BASED ALTERNATIVES TO THE
OCEAN DUMPING OF SLUDGE

January, 1977

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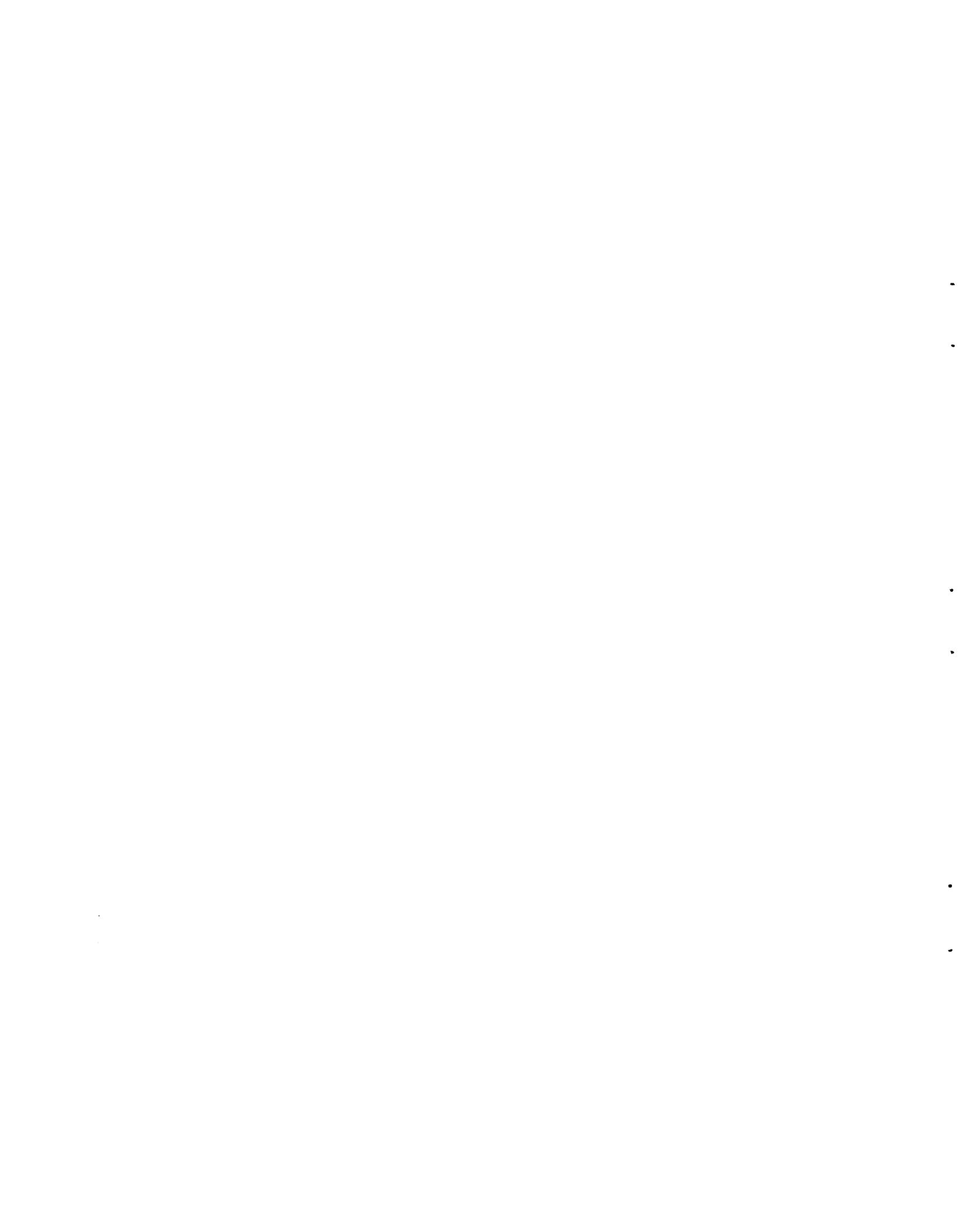


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I. HISTORY AND PROJECTED FUTURE OF SLUDGE DUMPING IN THE OCEAN WATERS OFF NEW JERSEY

The 12 Mile Site

The existing sewage sludge dumping site located about 12 miles southeast of the entrance to New York Harbor (see map in the appendix) is now used almost exclusively for the disposal of sewage sludge from large sewage treatment facilities in the northern New Jersey-New York metropolitan area; this site is often called the "12 mile site." (Prior to 1974, some industrial wastes were also dumped at this site; now only small quantities of sludge from industrial wastes are dumped there.) This location was selected by the States of New York and New Jersey in 1924 following a United States Supreme Court settlement. This settlement was the culmination of a suit brought by the City of New York against the Passaic Valley Sewerage Commissioners (PVSC) to prevent the discharge of sewage sludge by PVSC directly into Upper New York Bay. The 12 mile site was chosen to protect public health and to maintain desirable aesthetic conditions on Long Island and New Jersey beaches, as well as to reduce hazards to navigation within New York harbor caused by the vessels carrying and dumping the sludge.

Although dumping at the existing site began in 1924, accurate records prior to 1960 are not available. The volume of sewage sludge dumped at this site has increased from 3.8 million cubic yards, or yd³ (3.2 million wet tons*) in 1960 to 5.6 million yd³ (4.7 million wet tons) in 1973. In 1974 and 1975, the volume dropped slightly to 4.9 and 4.8 million yd³ (4.1 and 4.0 million wet tons), respectively. The average annual volume dumped from 1960 to 1975 was 4.3 million yd³ (3.6 million wet tons).

The U.S. Environmental Protection Agency's (EPA) Draft Environmental Impact Statement on Dumping of Sewerage Sludge in New York Bight (Draft EIS) shows that twelve municipal or private sewerage authorities produce about 95 percent of the sludge dumped at this site. The largest single source is the system of sewage treatment facilities owned by New York City; these produced approximately 49% of all the sludge dumped in 1974. Major New Jersey municipal or sewerage authority permittees (Passaic Valley Sewerage Commissioners, Middlesex County Sewerage Authority, Bergen County Sewerage Authority, Rahway Valley Sewerage Authority, Linden-Roselle Sewerage Authority, and the Joint Meeting of Essex and Union Counties) in total account for approximately 34%. Forty-seven smaller New Jersey authorities account for 9%. Two large New York State authorities, Westchester County and Nassau County, account for 8%. Smaller authorities in New York State account for less than 1% of the total. Thus New Jersey's total share is approximately 43% and New York State's is 57% of the total sewage sludge dumped at the 12 mile site. All sludge producers in New York and New Jersey except New York City and Westchester County contract with commercial barge companies to do the actual dumping. New York City and Westchester County operate their own dumping vessels.

* A wet ton of sludge is from 5-10% (by dry weight) of solid material, with the rest being water.

Other Existing Dumping Sites Off New Jersey

There are other dumping sites in the waters off New Jersey where the disposal of toxic and nontoxic wastes is permitted under the authority of the Federal Marine Protection, Research, and Sanctuaries Act of 1972, often known as the "ocean dumping law". These sites are all east of New Jersey. They include sites for the disposal of (1) dredged material, (2) demolition debris (also known as "cellar dirt"), (3) acid wastes, and (4) wrecks (derelict vessels). Since these four sites do not enter into the current issue of whether or where to move the sludge dumping site, they are not discussed further and are not shown on the attached map.

Another dumping site, the chemical waste dumping area, is located approximately 106 miles southeast of the entrance to the New York harbor beyond the edge of the continental shelf; it is commonly known as the "106 mile site". Since it has recently been suggested as an alternate site for the disposal of sewage sludge, it is shown on the map in the Appendix.

According to EPA, roughly 70 percent of the municipal wastes and 60 percent of the industrial wastes dumped from surface vessels into the oceans off the United States are dumped at the six sites briefly described above. In most other parts of the U.S., sludge and other materials are discharged through underwater pipelines into the ocean, rather than being transported by surface vessel and dumped.

Ocean Dumping of Sewage Sludge Off the Delaware-Maryland Line

For completeness, even though this site is not directly an issue regarding alternatives to the 12 mile site, the map shows the location of a second sludge dumping site roughly 35 miles east of the Delaware-Maryland boundary. The volume of sludge dumped at this site in 1974 was approximately 0.9 million yd³ (0.8 million wet tons), about one-fifth of the amount dumped at the 12 mile site. This sludge is produced by sewerage authorities in Camden and Philadelphia. On November 10, 1976, EPA's Regional Office in Philadelphia withdrew Camden's permission to use this site. Subsequent court action resulted in Administrator Train's temporary reversal of that action by EPA's Regional Office, and the resumption of dumping at that site until March, 1977. (Camden is also the site of a major test of an alternative to ocean dumping; see Section V below.) Philadelphia's existing permit from EPA expires during the summer of 1977; in the meantime, Philadelphia continues to dump at the 35 mile site.

Projections of Future Dumping

The amount of sludge produced by New Jersey and New York sewage treatment authorities is expected to double between 1973 and 1981 as new sewage treatment facilities come on line. In 1981, approximately 99 percent (up from 95 percent in 1975) will be produced by the present municipal and sewerage authority permittees. The remaining

1 percent of the future load (down from 5 percent in 1975) will be dumped by the three present commercial or industrial permittees. Projections are that in 1981, a total of 13.3 million yd³ (11.2 million wet tons) of sewage sludge will be dumped in the ocean off New Jersey.

The City of New York, Westchester County, Passaic Valley, Middlesex County, Linden-Roselle, and Joint Meeting are expected to remain the largest generators of sludge in 1981. The largest relative growth in volume, a fivefold increase, is projected for Westchester County. New York City will continue to be the largest single sludge generator in New York State, and Passaic Valley and Middlesex County the two largest generators in New Jersey.

The goal of the U.S. EPA is to phase out ocean dumping completely by December 31, 1981. The New Jersey Department of Environmental Protection (DEP) strongly supports this goal.

II. THE IMPACT OF SLUDGE DISPOSAL

The Current Sludge Dumping Site

Sludge dumped at the 12 mile site has clearly overwhelmed the assimilative capacity of the ocean waters and ocean bottom there; the area is commonly and correctly known as the "Dead Sea". The area of direct impact on the ocean bottom is not confined to the zone designated for actual dumping. Ocean currents have spread the sedimented material beyond this zone, though this spreading may now have stopped. Thus while the zone designated for dumping covers less than 7 square miles, the area of ocean bottom actually affected may be as large as 25 square miles. The accumulation of sludge sediment has been rather slow, amounting to a total of six inches over the last half century of dumping. In large part this is due to the fact that sludge, as dumped, is about 5% solid materials and 95% water. In addition, a fraction of the sludge either dissolves (see the next section on nutrients) or is small and light enough to drift away from the site. But this slow rate of accumulation has been sufficient to blanket the ocean bottom with enough sediment to effectively overwhelm the natural bottom life. A corollary is that the end of dumping at this site would allow natural ecological processes to begin to correct the damage already directly done to this potentially highly productive area of the continental shelf.

Nutrient Levels in New Jersey Waters

Above and beyond the immediate localized impact, the sludge dumped at the 12 mile site contributes a significant share of certain other materials in a much larger region of the ocean. Some background is necessary to appreciate this.

In the absence of human activity, natural sources of plant nutrients or fertilizers (such as nitrogen and phosphorus compounds) from the land provide the materials needed for the growth of marine plants such as algae which, in turn, provide the basic food and

energy sources for the rest of the marine ecosystem. However, man's activities are extensive on land areas adjacent to the ocean waters off New Jersey; these human activities have contributed substantial additional quantities of plant nutrients to the ocean waters.

Unfortunately, a fully definitive assessment of the relative impact of natural phenomena as opposed to human activities on ocean nutrient levels cannot be made at this time. Nonetheless, an approximate estimate of man's impact can be made, particularly as to the relative importance of various potential sources of these nutrients. Using available data from both published sources and unpublished files, DEP has roughly estimated the major sources of nitrogen-containing and phosphorus-containing nutrients in the coastal waters off New Jersey; these were included in two previously published DEP reports. (See Table 1) These DEP estimates should be considered both approximate and preliminary. Unfortunately, there is no single comprehensive or uniform monitoring and reporting system that would allow a thorough evaluation of all potential nutrient inflows into coastal waters in the New Jersey-New York region. For example, available data does not allow a precise determination of the amount of the plant nutrients in agricultural fertilizers that may enter coastal waters via the watersheds draining into New Jersey rivers, the Hudson River, and the bays of New Jersey and Long Island. Neither is it possible to accurately estimate the amounts of plant nutrients in the raw and treated sewage from all inland New Jersey communities which flow through the coastal bays and estuaries into the open ocean. These and other uncertainties have led to many theories on the relative importance of each potential nutrient source in the metropolitan area of North Jersey and New York, including speculation on the role of the sludge dumping site and the dredge spoil disposal site off Sandy Hook, and the impact of sewage, treated and untreated, from along the New Jersey shore.

Even with the uncertainty in these estimates of plant nutrients or fertilizers, the northern New Jersey-New York drainage area, which eventually collects into the Hudson, Hackensack and Passaic Rivers, is by far the largest source of nutrients discharged into the ocean waters off New Jersey; about 50% or more of the estimated annual additions come from the areas drained by those river systems. The disposal of dredge spoils at the site to the east of Sandy Hook is potentially a large source of phosphorus at least; the impact of dredge spoils on ocean nutrient levels has been poorly studied and deserves substantial additional effort.

TABLE 1

ROUGH ESTIMATES OF THE PERCENTAGE OF NITROGEN,
PHOSPHORUS AND ORGANIC CARBON FROM MAN'S ACTIVITIES
DISCHARGED INTO NEW JERSEY'S COASTAL WATERS

	<u>Nitrogen</u>	<u>Phosphorus</u>	<u>Organic Carbon^a</u>
Domestic and Industrial Wastes	67%	42%	62%
Sewage Sludge Dumping ^b	7	4	11.5
Dredge Spoil Dumping ^c	11	50	12.5
Other	<u>15</u>	<u>4</u>	<u>13</u>
Total	100%	100%	100%

^a Measured as biological oxygen demand (BOD).

^b Assumes 50% of the total nitrogen dumped enters the marine ecosystem.

^c Crude estimates of loading from miscellaneous sources, including runoff, atmospheric sources, chemical wastes, etc.

Sources: DEP's August 2, 1976 Report on the Fishkill off the New Jersey Coast and DEP's October 7, 1976 Report on Ocean Pollution Causes and Remedies in the Atlantic Coastal Area (and the references contained therein).

All these sources should be considered significant, since each contributes an important fraction of the total estimated discharges. These include the communities both along and inland from the ocean, dredge spoils, the miscellaneous sources, and, finally the sludge dumping site to the east of Sandy Hook, the main emphasis of this report. (This estimate assumes that 50% of the nitrogen in disposed sludge and dredge spoils eventually finds its way into the ocean waters; while we believe this estimate is a reasonable one, it too should be investigated further.)

These estimates, even though preliminary, lead us to conclude that no single discrete source of plant nutrients can be indicated as the only cause of the fertilization (or "enrichment") of the offshore waters. Further, any analysis of the possibility of reducing the amount of nutrients released into the offshore waters must be directed at all known sources of these nutrients. At the extreme, the complete elimination of any single one of these sources of nutrients would not eliminate the basic over-fertilization of the ocean waters off New Jersey. If a judgement can be made that this

over-fertilization is taking an ecological toll (see Section III), then the possibility of reductions from each source must be evaluated for feasibility, cost, and effectiveness. This report focuses on the one such source, sludge dumping.

III. THE FISHKILL OF 1976

Description of the Fishkill

The immediate set of events leading to last summer's fishkill began in February, 1976 with the development of a larger than normal population (a "bloom") of one particular species of marine algae, a dinoflagellate known as Ceratium tripos. Early in the year, the elevated Ceratium levels were distributed throughout the water column. The area having this bloom extended from the Georges Bank off Nova Scotia to south of Cape May County in New Jersey and reached from within a few miles offshore out to the edge of the continental shelf. As spring turned to summer, the Ceratium grew slowly but steadily, and began to accumulate near the thermocline (the zone between warmer surface waters and colder bottom waters that normally develops each summer in the ocean). The relative absence of major storms in early 1976 and the relatively warm, sunny weather probably hastened the development of the thermocline. Ceratium's preference for relatively cool water also contributed to their accumulation near the thermocline where the species could find favorable temperatures and ample sunlight for photosynthesis in addition to abundant nutrients. By early June the densities of Ceratium in the waters off New Jersey had become very high (up to 500 cells/milliliter) and were very strongly localized at the thermocline.

By late June, the massive off-shore algal bloom was raining substantial amounts of cellular material from dead and dying Ceratium down onto the ocean bottom. Bacterial decay of this Ceratium material drastically reduced dissolved oxygen levels on the ocean bottom. Over the July 4th weekend, sport divers visiting ship wrecks observed dead ocean creatures and noticed an unusual blackish or brown layer of material on the ocean bottom. This material was analyzed and found to contain extremely high levels of Ceratium.

As a result, members of many bottom-dwelling marine species (such as lobsters and surf clams) died from a lack of oxygen or related effects, such as the buildup of toxic hydrogen sulfide that can follow oxygen depletion. (See below.) Other species (such as hake, fluke and sea bass), at least in part, were able to migrate away from the low oxygen zone. The oxygen levels in surface waters were unaffected by this incident; surface species (such as bluefish, striped bass and menhaden) were not harmed.

Sampling of the ocean bottom by DEP and federal agencies indicated that the zone of worst oxygen depletion (levels below 1 part per million, where 5 parts per million is considered normal) extended from Sandy Hook on the north to Avalon on the south, a distance of about 100 miles; the zone was as much as 40 miles or

more wide. Within this area, the zone essentially resembled an ink blot; the map in the Appendix shows the area of oxygen depletion during mid-summer. During early August, the northern areas improved and, in some areas, came back to normal. In the south, low oxygen levels persisted. The zone apparently moved and expanded slowly southward before stopping. Over 3,000 square miles of ocean bottom were affected by this event; this is an area about 40% of the size of the State of New Jersey.

The primary effects off-shore have been on lobsters and surf clams (and thus on the industries that depend on them) and on bottom fishing (which has affected the sport fishing industry). Dollar estimates of the damages are given later in this Section. The direct on-shore effects of the off-shore ecological catastrophe have been infrequent and isolated. The so-called "black tide" of decaying algae that washed ashore at a few locations was often alleged to be sewage sludge from the 12 mile site or from coastal discharge pipes. DEP investigations have shown that, while there were isolated bacterial and other problems this summer due to sewage outfalls (pipes discharging treated waste from sewage treatment plants), none of the incidents observed at the Jersey shore was directly caused by the presence on the beaches of sewage sludge itself (either from the sludge dumping site or from treatment plants along the shore). With a few exceptions, the Jersey beaches and the ocean surf remained in excellent condition throughout the duration of these off-shore conditions; the tourism industry did not suffer.

Public concern about the "black tide" has already focused attention on all the sources that contribute to the fertilizing of the ocean and also on other factors that led to the algal bloom. Further attention should be focused on the desirability, feasibility, and costs of any steps that could be taken to minimize the probability of another such event in future years; that is one purpose of this report.

While there is controversy over the exact role of each factor that contributed to the fishkill, there is a consensus that the present pollution control activities alone, while important, will do little to reduce the chances of another massive fishkill. The major question then becomes: What additional steps should be taken to reduce the chances of another fishkill? Unfortunately, due to insufficient basic research and field monitoring of the Atlantic coastal waters, the examination of potential additional steps must be done with inadequate and incomplete data. Thus the assumptions used to reach any conclusions should be carefully specified so that the assumptions can be reviewed as new information is acquired; in this report we have attempted to identify the assumptions we used. For example, it is still uncertain whether this year's algal bloom is due to reaching a critical level in the long-term build-up of plant nutrients, or instead is an abnormal biological response of algal growth in a region with relatively constant (though high) nutrient levels. (The latter would be possible, for example, if the bloom was basically attributable to unusual physical conditions, such as plentiful sunlight to stimulate rapid algal growth.)

While moving ahead to treat and remove the well-recognized sources of organic pollution (e.g., sewage and sludge), from the bays and ocean, DEP is also analyzing the effectiveness and costs of more advanced treatment and other measures which may be needed in the future to reduce the likelihood or extent of future "black tides" off the New Jersey shore. Some of these preliminary analyses, with emphasis on sludge are included in Sections IV and V below. But first, it is useful to review the current understanding of the more indirect but still significant causes and origin of the 1976 fishkill and similar (though more localized) events in earlier years.

Past Events Similar to the 1976 Fishkill

Fishkills off the New Jersey coast have been reported in the summers of 1968, 1971 and 1974, in addition to less well documented reports from the 1950's and even earlier. These past kills were similar to the 1976 incident in several ways. The marine organisms affected and the location (several miles offshore in the colder bottom layers of water) were the same, though the areas affected in earlier years were much smaller. The low dissolved oxygen levels and suspended flocculent material found during the 1976 fishkill were also sometimes discovered during the previous events. The 1976 incident differs from previous ones because of its persistence over the summer, the establishment of a more extensive and stronger thermocline than is typical, and the presence on the ocean bottom of hydrogen sulfide in potentially lethal concentrations. The 1968 fish kill had been the largest previously reported, covering an area of approximately 270 square miles compared to the approximately 3,000 or more square miles involved in the 1976 incident. The earlier incidents also had generally occurred during the late summer - early fall period as opposed to the summer-long event of 1976 (late June-October). Thus the 1976 fishkill has had certain precedents, but differs in scope and severity from previously recorded fish kills.

Perspective on the Origin of the Fishkill

There is general agreement on several points related to the 1976 fishkill. First, even given the history of uncommon but similar events over the last several years, there is no doubt that the 1976 episode dwarfs any similar episode previously reported off the New Jersey shore. While the precise shape of the zone of the lowest oxygen concentrations is impossible to determine with certainty, it was found as far north as Sandy Hook and as far south as Cape May County (see the attached map). The distance between the closest point to shore and the farthest offshore point was approximately 50 miles. Even without any clear indication of the total number or tonnage of all species of ocean creatures now dead, this must be considered a massive kill.

Second, the extremely low dissolved oxygen concentrations on the ocean bottom were low enough to cause death in many marine organisms; divers, surf clammers, commercial fishermen, and state and federal scientists all saw such dead organisms during the summer of 1976. Results recently available from federal laboratories suggest that there was a second potential cause of death as well. When bacteria of decay use up all the oxygen in the water, they can then use naturally occurring sulfur compounds in their metabolism instead of oxygen; a bacterial by-product is the release of hydrogen sulfide (the source of the "rotten egg" odor in decaying plant or animal life, some marshes, etc.). Unfortunately, most other organisms cannot use sulfur to replace oxygen in their life processes. In fact, hydrogen sulfide is extremely toxic to many higher organisms, including marine species. For example, surf clams can survive for many days with low levels of dissolved oxygen, but can be quickly killed by elevated levels of hydrogen sulfide. In at least certain areas, the ocean bottom had both low oxygen levels and elevated hydrogen sulfide, resulting in a one-two punch to any marine organisms in such a zone.

Third, the drastically reduced oxygen concentrations on the ocean bottom were due to the bacterial decay of a combination of abnormally large quantities of dead algae and (later) of the dead bottom organisms. The normal bacterial decay of organic wastes results in some drop in the oxygen levels on the ocean bottom, since bacteria use oxygen in their life processes when it is available. An excessive amount of dead algae on the ocean bottom means an explosive growth of the bacterial population; in turn, the increased number of bacteria use more oxygen than would normally be used. Calculations have shown that the oxygen needed for the bacterial decay of the Ceratium levels present this summer was roughly what was needed to initiate the conditions leading to the unusually large fishkill. When this oxygen need is added to the normal amounts of oxygen used in this region and also to the oxygen used in the decay of organisms (e.g., surf clams) that were killed by the low oxygen levels, there was probably more than enough drain on oxygen supplies on the ocean bottom to maintain the low oxygen condition and contribute to its spread.

Fourth, the increased loading of decaying algal matter on the ocean bottom was due to a massive growth of algae higher up in the ocean. While some people believe other species may be responsible, most observers believe the tremendous bloom of Ceratium tripos (termed an algal species in this report, and more precisely known as a dinoflagellate) in the thermocline is the primary cause, and that the dead and dying algae resulting from this bloom rained down on the ocean bottom in much larger amounts than normal and over a much larger area than heretofore observed.

Fifth, the existence of a highly stable thermocline, the relative absence of storms this year, and abundant sunlight have all contributed to the massive algal bloom. The role of the weather deserves a bit more discussion. In general, algal growth depends on incoming solar radiation among other factors. The amount of sunlight is a critical factor, since the sun is the source of energy for photosynthesis, which in turn supports the basic growth of algae. A preliminary investigation by DEP indicates that both the 1976 fishkill and earlier ones were associated with long periods of more-or-less continuous sunshine. For example, the 1976 fishkill occurred during a period which had less than 20% cloud cover, far less than normal. In fact, the month of June had a cloud cover for less than five days, whereas on the average, June has approximately 12 cloudy days. Similarly, the month of June in 1971 had fewer than eight cloudy days. Although the relationships at this point are not completely clear, we believe that the relative absence of cloudy days may be an important factor in the fishkills of 1968, 1971 and 1974 as well as 1976. (While the role of the weather must be recognized in any overall perspective on the fishkill, it is also important to remember, from a policy viewpoint, Mark Twain's observation that while everybody talks about the weather, no one can do anything about it.)

Sixth, most observers agree that there are ample quantities of nutrients (fertilizers) available in the ocean waters off New Jersey to support an algal bloom even more extensive than this one. (But why the abnormal bloom of Ceratium became dominant over blooms of other species in 1976 is still unanswered).

From this point on, the consensus breaks down, particularly as to the importance of the several sources of plant nutrients. There are many theories as to which source or sources of the needed plant nutrients are the most critical. The estimate of the sources of key nutrients given earlier in Table I suggests that each source has contributed a significant share to the available nutrients. While many people have a favorite single cause on which to blame this phenomenon, the estimated nutrient loadings indicate that it is the combination or sum total of sources which should be blamed; in other words, there are many culprits, not just one. The public policy choices thus become more complex: which sources can be reduced most rapidly and efficiently, if the basic goal is to reduce the chances of another massive fishkill? On this point, see Section V below.

The plant nutrients necessary for the growth of marine algae have many sources. The largest single source is human sewage. Sewage treatment facilities have as one main function the removal of organic (carbon-containing) material. These facilities do relatively little to reduce the amount of nitrogen and phosphorus nutrients discharged after treatment; this is particularly true if the sludge residues from the treatment plant are also eventually put in the ocean, as is now the case for virtually all of the northern New Jersey-New York metropolitan area.

Assessment of the Economic Cost of the Fishkill

The fish kill had dollar costs as well as purely ecological ones. Surf clams and lobsters, for example, take several years to grow to maturity. Large segments of all age groups (and thus all sizes) were killed this summer; for instance, the National Marine Fisheries Service has estimated that perhaps as much as 50% of the total off-shore surf clam population was killed. Using knowledge of the normal life cycles and growth rates of the species affected, and the presently available, admittedly fragmentary data on the extent of the kill, reductions in catches, decline in sport fishing, etc., DEP's Division of Fish, Game and Shellfisheries has roughly estimated the economic cost of the fishkill in dollar terms. This estimate, developed in early December, 1976 is summarized in Table 2.

This estimate does not include certain indirect losses (such as lower local tax revenues or the costs borne by public and private agencies in investigating the event) and other suspected but hard to assess costs. For example, the Department of Labor and Industry (L&I) has, in a preliminary assessment, already determined that the reduction in surf clam catches has resulted in a shorter work week for people working at clam processing facilities, though there have not been any significant reductions in total employment at these facilities. Further, L&I reports that fish and shellfish wholesalers are having problems in obtaining adequate supplies of certain species, and further that the decreased supply of some species has brought about increases in the prices the wholesalers must pay for those species. Finally, L&I reports that fish retailers believe that the mistaken impression that fish are contaminated by sludge may be making the general public less interested in buying fresh fish, even species that were not at all affected by the fishkill. (It is important to note that the offshore event did not cause any contamination of fish or shellfish with organisms that cause human disease.)

IV. ALTERNATIVE SLUDGE DISPOSAL SITES FOR THE SHORT TERM

Last February EPA issued a Draft EIS on the issue of ocean dumping of sewage sludge off New Jersey and New York. This document proposed that all existing sludge dumping be abandoned by 1981 and analyzed the pros and cons of using two alternate dump sites roughly 60 miles out in the ocean until 1981; these sites are shown on the attached map. The draft EIS indicated that there would be significant adverse environmental effects if the two proposed alternative sites were to be used and recommended that dumping at the 12 mile site be continued until the 1981 deadline. This proposal was based on the view that, since the existing site is already contaminated, additional sludge dumping will not significantly increase pollution in that area and also will not present a

TABLE 2

ROUGH ESTIMATE OF THE ECONOMIC
COST OF THE FISHKILL^a

\$ 25,000,000	Loss in Sport Fishing Revenues (over 1 year period)
1,500,000	Loss in Commercial Finfish Stocks ^b
2,000,000	Loss due to Reduction in Lobster Stocks (over 4 year period) ^c
65,000,000	Loss due to reduction in Sea Clam Stocks (over 7 year period) ^d
<u>171,000,000</u>	Loss in related economic activity due to reduced commercial landings ^e
\$264,500,000	TOTAL ^f

^a Prepared by DEP's Division of Fish, Game and Shellfisheries, (DFGS) December, 1976.

^b Based on telephone interviews and questionnaire survey by DFGS, 1976.

^c Based on landing data compiled during 1976 by the National Marine Fisheries Services.

^d Based on resource assessment by the National Marine Fisheries Service in 1976. It assumes 70% of the clam population killed would have been harvestable, and an average price per bushel during 1976 at \$9.00. At 1975 prices, the clam loss would be valued at \$16.2 million.

^e Based on a multiplier of \$2.50 loss on onshore economic activity for every \$1.00 reduction in the offshore catch.

^f Assuming instead the 1975 average price of \$2.25 per bushel of surf clams, this total would be \$93.7 million.

threat to public health or water quality along the beaches of Long Island and New Jersey. Moreover, the draft EIS noted that contamination of a new area on the continental shelf might not be balanced by the recovery at the existing dump site.

DEP agreed with this conclusion prior to the fishkill this summer. Now we are rethinking and reviewing our policies and programs in view of this ecological disaster. Based on offshore surveys by the National Marine Fisheries Service and some calculations DEP has done on nutrient loadings in the coastal waters, we believe the two previously proposed sites located approximately 60 miles offshore are not far enough from shore to significantly affect nutrient levels on the continental shelf. In fact, they overlap part of this summer's fishkill area; see the map in the Appendix for a graphic demonstration of this. While we have not yet been able to find definitive data on the ocean currents in this region, we believe it very likely that nutrients and other pollutants from sludge dumped at either of the 60 mile sites might well be swept back toward shore. Equally important, as the Draft EIS notes, these two sites are presently not used for dumping of any wastes, and are therefore relatively unpolluted. Finally, since they are located on the highly productive continental shelf, they are important to the integrity of commercial fishery resources.

Many have suggested that a more useful short-term step would be to use the 106-mile site. However, after future analysis, even this may prove to be too close to prevent plant nutrients and other materials in the sludge from circulating back into the near-coastal waters. Unfortunately, federal research on currents and basic ocean circulation patterns have been insufficient to allow a reasoned judgement as to whether the 106-mile site is, in effect, far enough out. Biological information on the existing impact of the chemical wastes at this site is, at best, meager. Nevertheless, we believe that the 106 mile site should be considered by EPA as a serious and credible alternative for sludge disposal in the short run. We reached that conclusion after assembling and reviewing the best available information on both the environmental and economic factors that EPA should evaluate more fully before reaching a final decision on the use of the 106 mile site, and also our best judgement as to the environmental and economic trade-offs in moving, on an interim basis, from the 12 mile site to the 106 mile site. These considerations are described below.

Potential Ecological Benefits and Costs of Moving to an Alternative Site

For the reason given above regarding nutrient loadings, and also because they are currently unaffected (at least directly) by ocean dumping, we continue to believe that the two previously proposed 60 mile sites, which are on the continental shelf, should not be used. The 106 mile site, however, is already degraded, at least to some degree, and is located on the continental slope, typically a less productive area biologically than the continental shelf. In addition, the site may be far enough off-shore to keep

any nutrients in the sludge from returning to the near-shore water system. Both physical and biological data regarding this site are insufficient, but we believe that, on balance, there is a clear possibility that less environmental damage may occur by using the 106 mile site for the disposal of sludge as well as the disposal of chemical wastes. We recognize that special field surveys may be required to check such a judgement if the 106 mile site is used for sludge. Further such an environmental balance must be arrived at using a process in accord with applicable environmental laws. However, we believe that, on the basis of what we now know, the use of the 106 mile site is a reasonable and credible option meriting careful consideration by EPA.

Given the pitifully inadequate data on both the biological and physical conditions not only at the 106 mile site but also for the entire edge of the continental shelf and slope off New Jersey, this is in large part a matter of judgement and unfortunately not based on the firm and solid evidence we would prefer. For the benefit of others concerned with this issue, we have arrayed below the factors, both pro and con, that went into our judgement. They are presented in Table 3.

TABLE 3

ENVIRONMENTAL PROS AND CONS OF MOVING THE INTERIM SLUDGE
DUMPING SITE OUT TO 106 MILES

- + = favors moving to 106 mile site
- = against moving to 106 mile site

Nutrient Levels

12 Mile Site

- + a) is in the most heavily damaged region even in normal years; the sludge definitely contributes to pollutant levels which have heavily damaged the ocean bottom.
- + b) is in a region with relatively slow water movement.
- + c) is in the 1976 fishkill region.

106 Mile Site

- + a) May be far enough out in the open ocean so that nutrients may not be trapped in the water circulation of the 1976 fishkill zone.
- + b) is in deep water beyond the continental shelf so that sludge settling to the bottom may not contribute to nutrient levels on the continental shelf in the future.

TABLE 3 - Continued

Biological Factors

12 Mile Site

- a) is now a dead sea and probably couldn't be damaged much more by continued dumping.
- + b) if dumping was stopped, region might begin to slowly recover.

106 Mile Site

- a) bottom life may still be in good condition despite chemical dumping; sewage sludge could damage this life.
- + b) bottom life at such great depths is probably rather meager compared to that on the more productive continental shelf.

Economic Costs of Moving to the 106 Mile Site

Without question, there would be an increase in costs for the users of sewage treatment systems in North Jersey and New York if the 106 mile site is used instead of the 12 mile site. We have gathered information from a variety of sources and estimated approximately what these increases might be for New Jersey residents and the major sewer authorities that serve them. Later sections of this report contain equivalent rough estimates of the costs of two promising techniques for replacing ocean dumping, composting and pyrolysis.

For perspective, we have also analyzed the cost of ocean dumping at the 12 mile site. Presently, two private barging companies, Modern Transportation Company and General Marine Transportation Corporation, provide ocean dumping services to the northern New Jersey-New York metropolitan area on a contractual basis. New York City has its own fleet of self-propelled barges which have ample capacity to dump the sludge presently generated by New York City at the 12 mile site. Modern Transportation which generally serves the larger New Jersey sewerage authorities, presently charges from 80¢ to \$1.20 per wet ton of sludge to transport it to the 12 mile site for sewage authorities with their own docking facilities. General Marine, serving the smaller New Jersey authorities, charges higher rates in its current contracts. (As noted earlier, a wet ton of sludge is composed of about 90-95% water; the balance is organic material. Thus, depending on the source of the sludge 10 to 20 "wet tons" of sludge is equivalent to one "dry ton" of dehydrated or completely dry sludge solids.)

The total tonnage of sludge presently dumped at the 12 mile site is about 4.0 million wet tons per year, with the six largest New Jersey authorities contributing about one-third of the total. The cost to these six New Jersey authorities for use of the 12 mile site is roughly \$1.4 million dollars per year. Assuming that the cost per ton for use of the 12 mile site is roughly the same for other users, in particular for New York City (which is the source of about 50% of the sludge), the total cost of using the 12 mile site is over \$4 million per year. Even if no change in site location is made, these costs will increase somewhat in the near future due to increased costs of fuel, wages, etc. For convenience, we have chosen to use 1978 as the year for comparison. According to discussions with the barging company handling the larger New Jersey authorities, a typical cost in 1975 is \$1.25 per wet ton. Given increased costs of fuel, labor, etc., DEP estimates that a typical cost in 1978 for barging sludge to the 12 mile site will be roughly \$1.75 per wet ton.

The cost for using the 106 mile site would be substantially greater, based on discussion with one barging company and independent estimates by DEP staff. This is basically because the cost of capital, labor and indirect expenses (e.g., insurance) increase as the total time involved in barging increases. Also, fuel costs are directly related to the distance covered. A typical trip to the 12 mile site takes 24 hours, while a trip to the 106 mile site would require about three times as long. In addition, while experience has shown that 90% of the time barges can be used for round trips to the 12 mile site, the conditions on the open ocean are such that bad weather would curtail operations much more frequently. Information received by DEP indicates that barge utilization would only be 60% of the time for the 106 mile site, a substantial increase in idle barge time. These two factors alone will make it at least 4 times as costly (per wet ton) to use the 106 mile site as to use the 12 mile site in 1978. Fuel costs, not included in the estimate of a four-fold increase, will be 9 times as great for use of the 106 mile site. Thus DEP believes a reasonable estimate for 1978 is at least 4 times the cost estimated for the 12 mile site, or roughly \$7.50 per wet ton. (This estimate does not include any increase in the time required for actual dumping of the sludge which EPA might require, nor does it include any costs of accelerated amortization of investment.)

In summary, as part of our analysis, we have estimated the cost of barging sludge to the 12 mile as well as to the 106 mile sites in 1978. The cost of barging to the 12 mile site will increase by 1978 to approximately \$1.75 per wet ton. If dumping is moved to the 106 mile site, the increase will be much larger due to the longer travel distance, the resulting increase in fuel and other costs, and the fact that weather conditions may reduce the number of days a barge can operate each year; we estimate \$7.50 per wet ton (we believe that the total number of vessels presently involved in sludge dumping would be just adequate to handle the anticipated sludge production in 1978. It is not certain that barging companies would invest in additional equipment after that time, unless other uses could be found for barges after sludge dumping ends.)

Translated into other terms, a move to the 106 mile site involves an increase of from \$3.75 to \$9.50 per household per year for north Jersey residents using the services of one of the six large sewer authorities which currently dump sludge in the ocean. (See Table B for more details.) On a percentage basis, the increase in charges for five of the six authorities (direct or indirect) would range from 10% to 30% (Table D), depending on the characteristic costs for each sewer authority. Although the sixth authority (Joint Meeting) has the smallest estimated dollar increase in sewer charges for use of the 106 mile site, namely \$3.86, the percentage increase (80%) is much larger than the other five because its basic estimated sewer charge is extremely low (\$3.50 per household) compared to the estimated sewer bills for the other five (which range from \$13.60 to \$90.00 per household). For those communities which pay for their sewage service indirectly through their property tax (termed an ad valorem tax), the percent increase in the tax rate (or the tax on an average residential unit) would range from 0.2% to 1.0% for eleven of the twelve selected municipalities. The twelfth, East Rutherford, would have a larger tax increase (2.4%) because both its basic property tax rate and average tax per residential unit are relatively low. (See Tables C and D for the estimates for selected municipalities; analogous estimates for other municipalities can be relatively easily carried out).

The economic impact of moving the dumping site on general property tax rates for all taxable properties (residential, commercial and industrial) in these or other municipalities can also be calculated; separate calculations by DEP (not included in this report) show percentage increases from 0.25 - 1.7% for the same municipalities, generally somewhat lower than the estimated change in tax bills for households only. (The impact on general tax rates is lower than for households only because in the general case, the cost is assumed to be shared equally by all property owners, based on all property tax evaluations, rather than shared on the basis of an assumed per capita sewage flow of 100 gallons per day. If this assumption (see Table A and following ones) is too high, the detailed results in the Appendix for households summarized above are over-estimates for households, and thus underestimates for commercial and industrial facilities. In any event, the actual tax impact on any particular property will depend on, among other factors, the rate system used in each municipality.)

In total, the aggregate cost increase for the six major North Jersey sewer authorities, and the equivalent cost per wet ton and per dry ton of sludge produced, are shown below. (The values in Table 4 were calculated using information in Table A and G).

TABLE 4

SLUDGE DUMPING

COSTS FOR SIX NEW JERSEY SEWER AUTHORITIES

	Cost in 1975 for 12 <u>Mile Site</u>	Cost in 1978 for 12 <u>Mile Site</u>	Cost Increase To use 106 <u>Mile Site</u>	Cost Increase To use 106 <u>Mile Site</u>
Cost Per Wet Ton	\$ 0.95	\$ 1.75	\$ 5.75	\$ 7.50
Cost Per Dry Ton	13.74	25.30	83.33	109.00
Total Annual Cost (in \$ millions)	1.36	2.50	8.24	10.7

Assuming that similar cost increases would occur for the other New Jersey sewer authorities as well as those in New York State, the total cost to the region for use of the 106 mile site in 1978 would be roughly \$32 million, where as continued use of the 12 mile site would cost roughly \$8 million.

V. ECONOMICS OF LAND-BASED ALTERNATIVES TO OCEAN DUMPING OF SLUDGE

Sludge disposal is an important component of waste-water treatment, whether by ocean dumping or by other techniques. The costs of the treatment necessary for the safe and environmentally sound disposal of sludge would be a significant share of the total investment cost necessary for the treatment of raw sewage in a newly-built sewage treatment plant. Such disposal techniques would also add costs to the operation of existing sewage treatment plants of all types.

Land-based sludge disposal methods fall into two general categories: (a) pyrolysis and/or incineration, and (b) disposal of sludge directly on agricultural or other types of lands. The costs of these alternative methods for six sewage authorities and selected municipalities which presently resort to ocean dumping to get rid of their sludge are analyzed in this section.

Pyrolysis, also known as thermal conversion, is a controlled combustion process carried out in the absence of air. The process has been used by industry for many years in the production of charcoal and methanol from wood and also in coal gasification. The process requires heating the material being pyrolyzed so that the volatile matter will distill out, leaving behind a residue of carbon and inert substances (such as ash). Because the heating occurs in a low-oxygen atmosphere, the volatile materials do not burn in the

process. These volatile materials may then be separately burned. Alternately, the heated gases may be cooled and condensed to recover oils and tars which can be reprocessed and used as a fuel. Pyrolysis substantially reduces the total volume of sludge, destroys the odorous material in sludge, and leaves a bacteria-free end product. This process is, however, still in the experimental stage; therefore, the cost data from full-scale operating systems are not yet available. Also, at this time, the total reliability of the system cannot be ascertained. Accordingly this report only presents the approximate costs per ton for pyrolysis.

Incineration, or combustion of sludge in a plentiful oxygen supply, also produces a bacteria-free end product with a much smaller volume than the original sludge. The volatile materials are burned in the process, and thus are not recoverable. In addition, incineration has the potential to produce air pollution, making it unlikely to be broadly used in the densely developed north Jersey-New York metropolitan area. In general, without energy recovery, incineration would cost on the order of 20-30% more than pyrolysis. For these reasons, we believe pyrolysis to be a more likely alternative than incineration, and have not estimated costs for incineration.

Composting, a form of biological stabilization of sludge pioneered at Rutgers University, converts sludge to a non-odorous material and destroys the pathogenic organisms present in sewage sludges. Composting of sludge in the presence of oxygen has shown great potential as a sound means for the disposal of sewer sludge. Composting as is currently being done on an experimental basis at the United States Department of Agriculture Experimental Station in Beltsville, Maryland, is a simple process which requires less capital investment than other biostabilization techniques. The Beltsville method (which is commonly referred to as the "static pile" process) requires little energy and relatively little capital equipment, and is labor intensive. It converts sewage sludge to a peat-like material which has excellent soil conditioning properties. We anticipate that more mechanized handling techniques could substantially reduce the operating costs of composting. We believe this technique has many compelling advantages. Jointly with the City of Camden and EPA, DEP is already working to install a full-scale composting operation to handle all the sludge produced by the sewage from that entire city, thus removing Camden's need to dispose of its sludge in the ocean.

The operating experience at Beltsville allows reasonably firm estimates of the costs of composting for the current sludge production at the six large New Jersey sewage authorities. These estimates, shown in detail in Tables E-1 and E-2, vary from authority to authority, due to such factors as land cost and availability and the presence or absence of certain needed equipment (such as that needed to de-water the sludge before composting can be done), just as the total costs for sludge dumping vary among the authorities. The averages of these estimates are shown in Table 5.

TABLE 5

ESTIMATED AVERAGE 1978
TOTAL COSTS PER TON FOR SLUDGE DISPOSAL

	Dumping at 12 Mile Site	Dumping at 106 Mile Site	Composting	Pyrolysis
Per Wet Ton	\$ 1.75	\$ 7.50	\$ 5.30	\$ 18.00
Per Dry Ton	25.30	109.00	77.00	260.00

If the assumptions used are correct, composting of sludge cost substantially less than dumping at the 106 mile site. If the 106 mile site were shown to be not far enough out to reduce the chance of another offshore fishkill, the cost advantage of composting could be even greater.

Further, part of the costs to the sewage authorities (and their customers) of two of these alternatives, composting and pyrolysis, might well be paid for by federal and state grants. Current practice is that a large portion of any capital expense incurred by a sewage treatment authority is defrayed by state or federal grants. In contrast, operating expenses such as payments to other companies to barge sludge, are not presently reimbursable.

In particular, under current practices, roughly 83% of the costs for the equipment needed to be purchased by a sewage authority for composting or pyrolysis would be reimbursed by federal (75%) and state (8%) grants. Thus the actual costs directly to the sewage authority and its customers would be reduced somewhat from the figures above. We have estimated these direct costs below for the four alternatives.

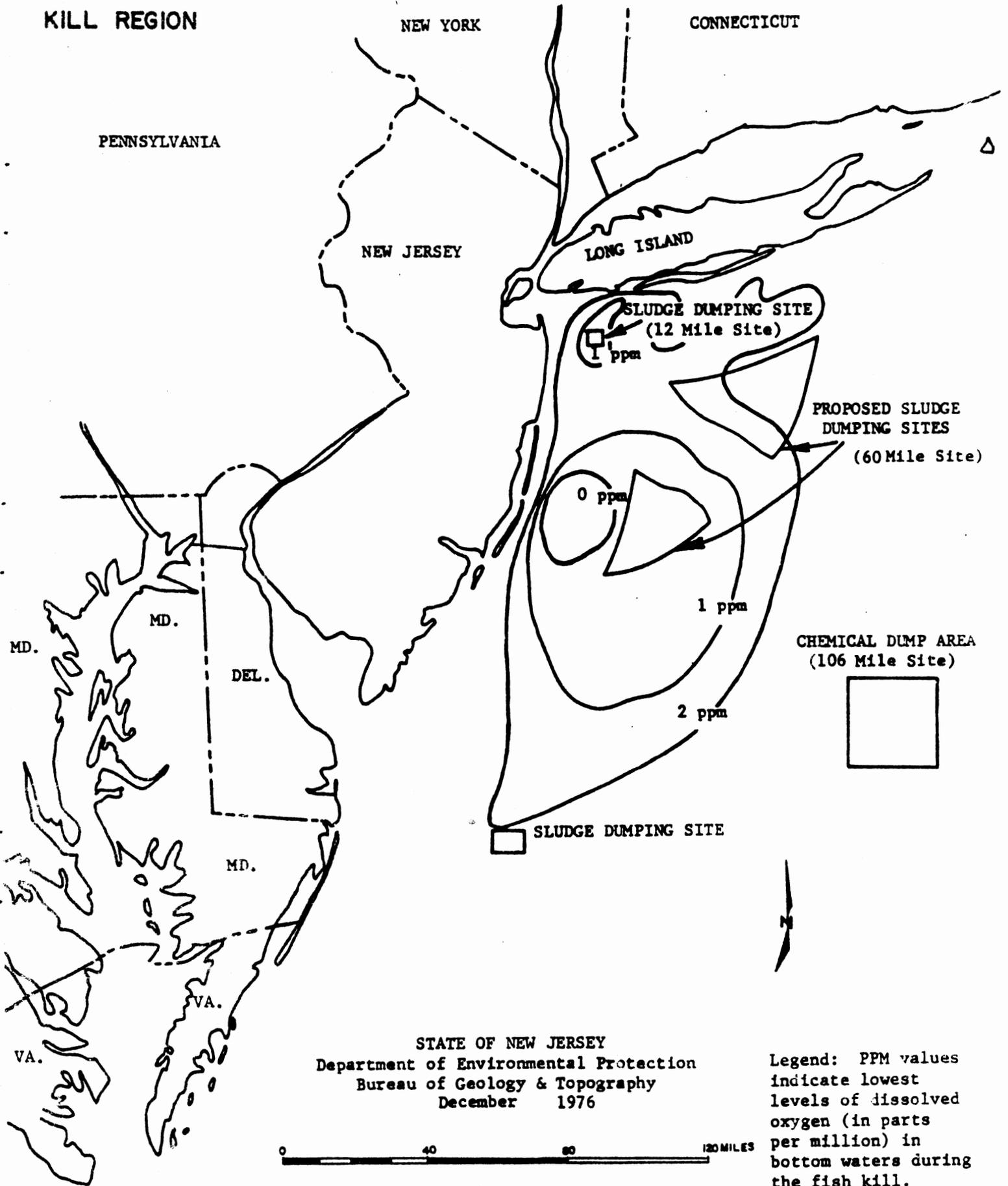
TABLE 6

ESTIMATED AVERAGE 1978
COSTS PER TON FOR SLUDGE DISPOSAL
DIRECTLY BORNE BY SEWAGE AUTHORITIES
AND THEIR CUSTOMERS

	Dumping at 12 Mile Site	Dumping at 106 Mile Site	Composting	Pyrolysis
Per Wet Ton	\$ 1.75	\$ 7.50	\$ 4.00	\$ 8.80
Per Dry Ton	25.30	109.00	57.80	127.50

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MAP OF EXISTING AND PROPOSED
DUMPING SITES AND THE FISH
KILL REGION



STATE OF NEW JERSEY
Department of Environmental Protection
Bureau of Geology & Topography
December 1976

Legend: PPM values indicate lowest levels of dissolved oxygen (in parts per million) in bottom waters during the fish kill.

TABLE A

COSTS FOR SEWAGE TREATMENT AND SLUDGE DUMPING
FOR SIX NEW JERSEY SEWAGE AUTHORITIES
BASED ON THE EQUIVALENT POPULATION SERVED*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
		Total Flow (MGD)	Equivalent Population (Thousands)	1975 Sludge Dumped (Thousands of Wet Tons)	1975 Total Budget (Thousands of Dollars)	1975 Sludge Dumping Costs (Thousands of Dollars)	1975 Calculated Total Sewage Cost Per Population Equivalent Per Year	1975 Sludge Dumping Cost Per Population Equivalent Per Year
Sewage Authority	Treatment							
Linden-Roselle	Primary	13.6	136	28	\$ 764.6	\$ 34.0	\$ 5.62	\$ 0.25
Joint Meeting - Essex & Union	Primary	69.2	692	116	599.9	110.1	0.87	0.16
Middlesex County	Primary	85.0	850	331	4,825.8	300.0	5.68	0.35
Passaic Valley	Primary	264.0	2,640	570	9,003.6	442.8	3.41	0.17
Subtotal	Primary	431.8	4,318	1,045	15,193.9	886.9	-	-
Rahway Valley	Secondary	32.6	326	110	2,612.2	246.3	8.01	0.76
Bergen County	Secondary	67.0	670	278	9,195.8	225.0	13.73	0.34
Subtotal	Secondary	99.6	996	388	11,808.0	471.3	-	-
TOTAL	-	531.4	5,314	1,433	\$27,001.9	\$1,358.2	-	-

*Sewage authorities treat wastewater from both homes and industries. As a rule of thumb, a person produces about 100 gallons of wastewater per day from all uses (bathing, sewage, etc.) Thus 100 gallons per day is equivalent to one person. All figures in this and succeeding tables are based on this equivalency.

TABLE A

<u>Column</u>	<u>Sources of Information</u>
(1)	Division of Water Resources, NJDEP, Unpublished Inventory of Point Sources, 1976
(2)	Same as (1)
(3)	Equivalent human population based on 100 gallons per person per day; thus the value here is (2) divided by 100
(4)	USEPA Region II's Office of Ocean Dumping (by telephone interview, December, 1976)
(5)	Telephone interviews (for Joint Meeting and PVSC) or published annual reports (all others)
(6)	Same as (5)
(7)	Column (5) divided by Column (3).
(8)	Column (6) divided by Column (3)

TABLE B

ESTIMATED COSTS PER HOUSEHOLD* OF MOVING THE
DUMPING SITE FROM THE 12 MILE SITE TO THE 106 MILE SITE

Sewage Authority	(1) 1975 Sludge Production (Wet Tons Per Population Equivalent Per Year)	(2) 1975 Sludge Dumping Costs	(3) Estimate of Sludge Dumping Costs for Use of the 12 Mile Site in 1978	(4) Estimate of <u>Increase</u> In Costs to use the 106 Mile Site in 1978	(5) Estimate of Total Costs to use the 106 Mile Site in 1978
Linden-Roselle	0.206	\$1.00	\$1.44	\$4.74	\$6.18
Joint Meeting - Essex & Union	0.168	0.64	1.18	3.86	5.04
Middlesex County	0.389	1.40	2.72	8.95	11.67
Passaic Valley Sewage Commissioners	0.216	0.68	1.51	4.97	6.48
Rahway Valley	0.337	3.04**	3.77**	7.75	11.52**
Bergen County	0.415	1.35	2.91	9.55	12.46

*All estimates are based on the equivalent population (see Table A) and assuming four people per household.

**Rahway Valley incurs extra costs because it pumps sludge to the Linden-Roselle facility for barge pickup; its actual barging and dumping costs per ton are the same for Linden-Roselle. The extra cost is estimated to be \$1.05 per ton (for pumping) for Rahway and has been included in the 1978 estimates.

Table B

<u>Column</u>	<u>Sources of Information</u>
(1)	Calculated from Table A
(2)	Calculated from Table A
(3)	Based on the assumption that sludge barging costs in 1978 will be \$1.75 per wet ton to the 12 mile site. The result in this column = (1) x \$1.75 x 4 persons per household.
(4)	Based on the assumption that the increased sludge barging cost in 1978 will be \$5.75 per wet ton to the 106 mile site. The result in this column = (1) x \$5.75 x 4

Note: Estimated 1978 Cost of Ocean Dumping at the 12 mile site - \$1.75/wet ton:

This estimate was obtained through a personal interview with the management of Modern Transport, Inc., the larger of the private companies that barge sludge. This represents the estimate cost of dumping for contracts let in 1977 to go into effect in 1978. A representative cost for a contract negotiated in 1976 is \$1.25 per wet ton.

Note: Estimate 1978 Cost of Ocean Dumping at the 106 mile site - \$7.50/wet ton minus 1978 cost of dumping at the 12 mile site equals \$5.75/wet ton.

Personal interview with the management of Modern Transport, Inc., confirmed through independent estimates made by DEP staff. Capital, labor and indirect costs of dumping are a direct function of the total time involved in barging. (Fuel costs are a function of distance.) The average amount of time required for a round trip to the 12 mile site is 24 hours. It is estimated that a round trip to the 106 mile site will require 72 hours - a threefold increase. However, the percent of potential working time that equipment can be utilized for barging to the 106 mile site is estimated to be around 60% compared to 90% of potential working time for the 12 mile site. This difference is attributable to the greater likelihood of bad weather curtailing operations. Thus there is a 30% decrease in equipment utilization time. This will make it at least 4 times as expensive to barge to the

Column

Sources of Information

106 mile site as to barge to the 12 mile site. This does not account for fuel cost increases which are proportional to distance and should therefore increase by around 9 fold. Thus the total cost for dumping at the 106 mile site can be conservatively estimated as upwards of fourfold the cost of dumping at the 12 mile site or somewhere in the order of \$7.50 per wet ton.

This does not account for possible longer dumping times that may be required at the 106 mile site. Nor does it account for risk factors and costs of accelerated amortization of investment that may increase in barging to the 106 mile site.

(5)

Column (3) + column (4)

TABLE C
CALCULATED AVERAGE TAX BILL PER HOUSEHOLD IN MUNICIPALITIES

	(1)	(2)	(3)	(4)	(5)	(6)
	Population	Approximate	1976	Average	1976	Estimated
Sewer Authority	(1976	Number	Assessed	assessment	Tax Rate	Average Tax
Municipality	Estimate)	of Households	Valuation of	per Household	(\$ per \$100 of	Bill per
		(Assuming	Residential Units	(Thousands)	Assessed Value)	Household
		4 per	(Millions)			
		Household)				
Linden-Roselle	Linden	42,100	10,525	\$362	\$34.4	\$ 695
	Roselle	23,100	5,775	104	18.0	1,120
Joint Meeting	Elizabeth	114,700	26,675	587	20.5	820
	Maplewood	24,500	6,125	177	28.9	2,130
Middlesex County	Piscataway	40,100	10,025	354	35.3	1,180
	Watchung	4,900	1,125	59	48.2	2,190
Passaic Valley	Newark	373,300	93,250	458	4.9	490
	Harrison	12,200	3,050	32	10.5	490
Rahway Valley	Rahway	29,700	7,425	233	31.4	1,160
	Westfield	34,100	8,525	369	43.3	1,800
Bergen County	E. Rutherford	8,700	2,175	38	17.5	390
	Paramus	28,900	7,226	408	56.5	1,470

TABLE C

<u>Column</u>	<u>Sources of Information</u>
(1)	State of New Jersey, Department of Treasury, December, 1976
(2)	Column (1) divided by 4
(3)	State of New Jersey, Department of Treasury, December, 1976
(4)	Column (3) divided by Column (2)
(5)	Telephone interview with tax assessors in each municipality
(6)	Column (4) x Column (5) x 10

TABLE D

ECONOMIC IMPACT OF MOVING THE SLUDGE DUMPING SITE ON THE SEWER AND TAX BILLS OF SELECTED MUNICIPALITIES

Sewage Treatment Authority	Municipality	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Estimated Average Tax Bill per Household	Sewer Bill per Household (Calculated Sewer Bill Based On Table A)	Sewer Bill Minus Dumping Cost	Sewer Bill Minus Dumping Cost Inflated By 25% to Approximate 1978 Costs	Estimated Total 1978 Sewer Bill Per Household (If 12 Mile Site is Used)	Potential Increase In Sewer Bill per Household After Moving Dumpsite	Percent Increase In Sewer Bill per Household After Moving Dumpsite	Percent Increase In Tax Bill After Moving Dumpsite
Linden-Roselle	Linden Roselle	\$ 695	\$ (22.50)	\$21.50	\$26.90	\$ 28.30	\$4.74	17%	0.7%
		1,120	(22.50)	21.50	26.90	28.30	4.74	17	0.4
Joint Meeting - Essex & Union	Elizabeth Maplewood	820	(3.50)	2.80	3.50	4.70	3.86	82	0.5
		2,130	(3.50)	2.80	3.50	4.70	3.86	82	0.2
Middlesex County	Piscataway Watchung *	1,180	70.00	68.60	85.75	88.50	8.95	10	0.8
		2,190	45.00	43.60	54.50	57.20	8.95	16	0.4
			or 60.00	or 58.60	or 73.25	or 76.00		or 12	
Passaic Valley	Newark Harrison	490	15.00	14.30	17.90	19.40	4.97	26	1.0
		490	(13.60)	12.90	16.20	17.70	4.97	28	1.0
Rahway Valley	Rahway Westfield	1,160	(32.00)	29.00	36.25	41.30	7.75	19	0.7
		1,800	(32.00)	29.00	36.25	41.30	7.75	19	0.4
Bergen County	E. Rutherford Paramus	390	69.00	67.60	84.55	87.50	9.55	11	2.4
		1,470	90.00	88.60	110.80	113.70	9.55	8	0.6

*Watchung has two separate billing areas; this is the reason for the two separate values.

TABLE D

<u>Column</u>	<u>Sources of Information</u>
(1)	Table C, Column (6)
(2)	Values in parentheses are calculated from Table A, Column (7), assuming 4 people per household. Other values are actual sewer bills as determined by telephone interview with municipal engineers or tax assessors.
(3)	Column (2) minus household sludge dumping cost (see Table B, Column (2))
(4)	Column (3) times 1.25
(5)	Column (4) plus estimated 1978 sludge dumping costs per household for the 12 mile site (See Table B, Column (3))
(6)	Table B Column (4)
(7)	Column (6) divided by Column (5)
(8)	Column (6) divided by Column (1)

TABLE E-1

ESTIMATED SLUDGE COMPOSTING COSTS DIRECTLY TO EACH AUTHORITY

Authority	(1) Amortized Capital Cost/Yr.	(2) Operating and Maintenance Cost/Yr.	(3) Total Cost Per Year	(4) Cost Per Year Directly to the Authority	(5) Cost/Dry Ton/Yr. Directly to the Authority	(6) Cost/Wet Ton/Yr. Directly to the Authority
Linden- Roselle	\$ 74,112	\$124,883	\$198,995	\$137,482	\$ 89	\$ 4.91
Joint Meeting	294,171	602,384	896,555	652,393	64	5.62
Middlesex	522,837	1,198,755	1,721,592	1,287,637	57	3.89
Passaic Valley Sewage Commissioners	768,755	1,909,777	2,678,532	2,040,465	53	3.58
Rahway Valley	182,633	343,864	526,497	374,912	71	3.41
Bergen County	499,218	1,133,870	1,633,088	1,218,737	57	4.38
TOTALS	\$2,341,726	\$5,313,533	\$7,655,259	\$5,711,626	--	--
WEIGHTED AVERAGE*	--	--	--	--	\$ 58	\$ 3.99

*The percentages for the total equivalent population for each authority are used as the factors.

Table E-1

Column

Sources of Information

- (1) Calculated by DEP's Division of Water Resources, January, 1977. The value includes such costs as land and dewatering equipment and also takes into account for example whether each authority already has certain needed equipment. Basic information sources were the U.S.E.P.A.'s publication, "A Guide to Systems" (1975) and the "Phase 2 Report of Technical Investigation of Alternatives for New York-New Jersey Metropolitan Area Sewage Sludge Disposal Management Program" prepared for the Interstate Sanitation Commission (1976). Further details for any authority are available on request from Dr. Marwan Sadat, Division of Water Resources, P.O. 2809, Trenton, New Jersey 08625.
- (2) Same as (1)
- (3) Column (1) + column (2)
- (4) Assuming that there will be a continuation of Federal and State grant assistance, 83% of the amortized capital cost will be in the form of such grants. Thus the total cost directly to the authority will be 0.17 times the capital cost plus the operating and maintenance costs.
- (5) Column (4) divided by Table E-2, column (2)
- (6) Column (4) divided by Table A, column (4)

Table E-2
TOTAL ESTIMATED SLUDGE COMPOSTING COSTS

<u>Authority</u>	(1) <u>Population Equivalent</u>	(2) <u>Sludge Production Dry Tons/Yr.</u>	(3) <u>Sludge Production Dry Tons Per Population Equivalent Per Year</u>	(4) <u>Total Composting Cost/Dry Ton</u>	(5) <u>Total Composting Cost Per Population Equivalent</u>	(6) <u>Total Composting Cost Per Household/yr.</u>
Linden- Roselle	136,000	1,540	0.0113	\$129.81	\$1.47	\$ 5.88
Joint Meeting	692,000	10,220	0.0148	87.73	1.30	5.20
Middlesex	850,000	22,510	0.0265	76.48	2.03	8.12
Passaic Valley Sewage Commission	2,640,000	38,190	0.0145	70.14	1.02	4.08
Rahway Valley Sewage Authority	326,000	5,280	0.0163	99.21	1.62	6.48
Bergen County	670,000	21,126	0.0348	77.30	2.69	10.76

Table E-2

<u>Column</u>	<u>Sources of Information</u>
(1)	Table A, column 3
(2)	Phase I Report of Technical Alternatives to Ocean Disposal of Sludge in the New York, New Jersey Metropolitan Area, Interstate Sanitation Commission, June, 1975
(3)	Column (2) divided by column (1)
(4)	Table E-1, column (3) divided by column (2)
(5)	Column (3) times column (4)
(6)	Column (5) times 4

TABLE F

Cost Impact Comparison: Sludge Dumping at 106 Mile Site vs. Composting

Sewage Treatment Authority	Municipality	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Estimated Total 1978 Sewer Bill Per Household If 12-Mile Site is used	Potential Increase in Sewer Bill per Household for Moving Dump Site	Cost for Composting per Household	Percent Increase in Sewer Bill for Moving Dumping Site	Percent Increase in Tax Bill for Moving Dump Site	Percent Increase in Sewer Bill for Composting	Percent Increase in Tax Bill for Composting
Linden-Roselle	Linden Roselle	\$ 28.30	\$ 4.74	\$ 5.88	17%	0.7%	21%	0.7%
		28.30	4.74	5.88	177	0.4	21	0.4
Joint Meeting of Essex and Union Counties	Elizabeth	4.70	3.86	5.20	82	0.5	111	0.6
	Maplewood	4.70	3.86	5.20	82	0.2	111	0.2
Middlesex County Sewage Authority	Piscataway	88.50	8.95	8.12	10	0.8	9	0.6
	Watchung	57.20 or 76.00	8.95	8.12	16 or 12	0.4	14 or 11	0.3
Passaic Valley Sewage Commissioners	Newark	19.40	4.97	4.08	26	1.0	21	0.7
	Harrison	17.70	4.97	4.08	28	1.0	23	0.7
Rahway Valley Sewage Authority	Rahway	41.30	7.75	6.48	19	0.7	16	0.3
	Westfield	41.30	7.75	6.48	19	0.4	16	0.2
Bergen County Sewage Authority	East Rutherford	87.50	9.55	10.76	11	2.4	12	2.4
	Paramus	113.70	9.55	10.76	8	0.6	9	0.6

Table F

<u>Column</u>	<u>Sources of Information</u>
(1)	Table D, column (5)
(2)	Table D, column (6)
(3)	Table E-2, column (6)
(4)	Column (2) divided by column (1)
(5)	Column (2) divided by Table C, column (6)
(6)	Column (3) divided by column (1)
(7)	Column (3) divided by Table C, column (6)

TABLE G

COMPARISON OF THE TOTAL COSTS OF OCEAN DUMPING AND COMPOSTING

Sewage Authority	(1)	(2)	(3)	(4) Cost for Dumping At 106 Mile Site (\$/Ton)		(6) Cost of Composting (\$/Ton)		(7)
	Dry Tons/Yr.	Wet Tons/Yr.	% Solids By Weight	Dry	Wet	Dry	Wet	
Linden-Roselle	1,540	28,000	5.5	\$136	\$7.50	\$130	\$7.11	
Joint Meeting - Essex & Union	10,220	116,000	8.8	85	7.50	88	7.73	
Middlesex County	22,510	331,000	6.8	110	7.50	76	5.20	
Passaic Valley	38,190	570,000	6.7	112	7.50	70	4.70	
Rahway Valley	5,280	110,000	4.8	177	8.55*	99	5.70	
Bergen County	21,126	278,000	7.6	99	7.50	77	5.87	
TOTALS	98,866	1,433,000	--	--	--	--	--	--
WEIGHTED AVERAGES	--	--	6.9	\$109	\$7.58	\$77	\$5.34	
WEIGHTED AVERAGES (excluding pumping)	--	--	--	\$109	\$7.50	--	--	

*The extra \$1.05 is due to the pumping needed by Rahway Valley; see footnote in Table B.

TABLE G

<u>Column</u>	<u>Sources of Information</u>
(1)	Table E-2, Column (2)
(2)	Table A, Column (4)
(3)	Column (1) divided by Column (2)
(4)	Column (5) divided by Column (3)
(5)	Estimate of sludge barging cost at 106 Mile Site
(6)	Table E-2, Column (4); rounded off to nearest dollar
(7)	Column (6) divided by Column (3)

TABLE H

ESTIMATED COSTS OF PYROLYSIS
(Based on 1975 sludge production)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Capital Cost (Millions)	Amortized Capital Cost (Millions)	Operations and Maintenance (Millions)	Total Yearly Cost (Millions)	Total Yearly Cost Directly To Authority (Millions)	Total Cost \$/ton Dry	Wet	Cost to Authority \$/ton Dry	Wet
Sevage Authority									
Linden-Roselle, Joint Meeting, Rahway Valley	\$ 35	\$ 3.2	\$2.4	\$ 5.6	\$ 2.9	\$329	\$20.5	\$171	\$11.4
Middlesex County	65	6.2	3.8	10.0	4.9	444	30.2	217	14.8
Passaic Valley Sevage Commissioners	39	3.5	1.5	5.0	2.1	131	8.8	55	3.7
Bergen County	32	3.0	2.2	5.2	2.7	246	18.7	128	9.7
TOTALS	\$171	\$15.9	\$9.9	\$25.8	\$12.6	-	-	-	-
Weighted Averages	-	-	-	-	-	\$260	\$18.0	\$127	\$ 8.8

TABLE H

<u>Column</u>	<u>Sources of Information</u>
(1)	Phase 2 Report of Technical Alternatives to Ocean Disposal of Sludge in the New York, New Jersey Metropolitan Area, Interstate Sanitation Commission, June, 1975.
(2)	Same as (1)
(3)	Same as (1)
(4)	Column (2) + Column (3)
(5)	Assuming that there will be a continuation of Federal and State Grant assistance, 83% of the amortized capital cost will be in the form of such grants. Thus the total cost directly to the authority will be 0.17 times the amortized capital cost (Column (2)) plus the operating and maintenance costs (Column (3)).
(6)	Column (4) divided by Table G, Column (1)
(7)	Column (4) divided by Table G, Column (2)
(8)	Column (5) divided by Table G, Column (1)
(9)	Column (5) divided by Table G, Column (2)



