

## APPENDIX



STATE OF NEW JERSEY

CHRISTOPHER J. CONNORS  
SENATOR—9<sup>TH</sup> DISTRICT  
SenConnors@njleg.org

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BRIAN E. RUMPF  
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DIANNE C. GOVE  
ASSEMBLYWOMAN—9<sup>TH</sup> DISTRICT  
AswGove@njleg.org

December 4, 2014

Douglas A. Fisher, Secretary  
New Jersey Department of Agriculture  
PO Box 330  
Trenton, NJ 08625  
(transmitted via e-mail)

**Re: Requested Status Report – Soil Restoration Standards – Barnegat Bay Action Item #4**

Dear Secretary Fisher:

This is a follow-up to our October 10, 2014 letter to Department of Environmental Protection (DEP) Commissioner Bob Martin requesting a status report regarding the development of soil restoration standards pursuant to P.L. 2010, c.113 which was forwarded to your Department.

Based on invaluable input provided by stakeholders as well as state experts, the soil restoration/compaction law was drafted and enacted with other legislative measures including a fertilizer restriction to better protect the Barnegat Bay from further degradation and assist in restorative efforts. In fact, the soil restoration law is Action Item #4 of Governor Christie's 10-point action plan for the Barnegat Bay. The fertilizer restriction law, which is the strictest in the nation, serves as Action Item #3.

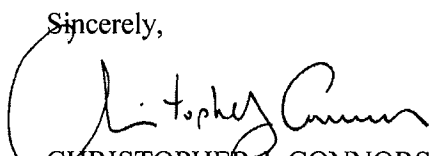
The urgency with which we are requesting a status update is due to our concerns over the Barnegat Bay, in particular, stormwater runoff and nonpoint source pollution. It is incredibly important to stress that the effectiveness of the fertilizer restriction law, which has been in effect for several years now, is seriously compromised without the establishment of soil restoration standards. To be effective, the two laws were designed to work in concert to prevent pollution from entering the state's waterways. While less fertilizer is being used due to the restrictions in place, the fertilizer will still enter our state's waterways as runoff if the soil is too compacted.


Douglas A. Fisher, Secretary  
December 4, 2014  
Page 2

Among the key benefits of these laws are the cost savings proactively achieved through pollution prevention as compared to what can routinely be costly, complicated and extensive clean-up efforts. As demonstrated by the Governor's 10-point action plan, significant resources have been dedicated by the state both in terms of funding and staff to protecting the Barnegat Bay. Alarming, the absence of soil restoration standards creates the very real potential of severely setting back or even undermining efforts initiated under the action plan.

Thank you, in advance, for your immediate attention to this communication. As always, we stand ready to work jointly with you in serving the people of the 9<sup>th</sup> Legislative District. We look forward to your timely response.

Sincerely,

  
CHRISTOPHER J. CONNORS  
Senator – 9<sup>th</sup> District

  
BRIAN E. RUMPF  
Assemblyman – 9<sup>th</sup> District

  
DIANNE C. GOVE  
Assemblywoman – 9<sup>th</sup> District

Cc: Hon. Chris Christie, Governor, State of New Jersey  
Hon. Bob Martin, Commissioner, New Jersey Department of Environmental Protection (NJDEP)  
Ocean County Board of Chosen Freeholders  
Barnegat Township Mayor and Governing Body  
Barnegat Light Borough Mayor and Governing Body  
Beach Haven Borough Mayor and Governing Body  
Beachwood Borough Mayor and Governing Body  
Berkeley Township Mayor and Governing Body  
Eagleswood Township Mayor and Governing Body  
Harvey Cedars Borough Mayor and Governing Body  
Lacey Township Mayor and Governing Body  
Little Egg Harbor Township Mayor and Governing Body  
Long Beach Township Mayor and Governing Body  
Ocean Gate Borough Mayor and Governing Body  
Ocean Township (Waretown) Mayor and Governing Body  
Pine Beach Borough Mayor and Governing Body  
Seaside Park Borough Mayor and Governing Body  
Ship Bottom Borough Mayor and Governing Body  
Stafford Township Mayor and Governing Body  
South Toms River Borough Mayor and Governing Body  
Surf City Borough Mayor and Governing Body  
Tuckerton Borough Mayor and Governing Body

2x.



## State of New Jersey

DEPARTMENT OF AGRICULTURE  
HEALTH/AGRICULTURE BUILDING  
PO Box 330  
TRENTON NJ 08625-0330

CHRIS CHRISTIE  
*Governor*

KIM GUADAGNO  
*Lt. Governor*

DOUGLAS H. FISHER  
*Secretary*

December 5, 2014

Hon. Christopher Connors, Brian Rumpf and Dianne Gove  
9<sup>th</sup> Legislative District Offices  
620 West Lacey Road  
Forked River, NJ 08731

Re: Status of Soil Restoration Measures

Dear Senator Connors, Assemblyman Rumpf and Assemblywoman Gove:

In response to your letter of October 10, 2014 (originally transmitted to Commissioner Robert Martin at NJDEP) requesting a status update on the revised Soil Erosion and Sediment Control Standards which are promulgated by the State Soil Conservation Committee, under the New Jersey Department of Agriculture, we provide the following.

There are two Standards (design requirements) within the current Standards for Soil Erosion and Sediment Control which contain the elements pertaining to the "soil restoration" objectives identified in P.L. 2010, Chapter 113 - the Standard for Topsoil and Standard for Land Grading.

In response to Chapter 113, these chapters were evaluated by a multi-disciplinary team of stakeholders, program staff and members of academia. Modifications were then proposed. The proposed revisions, though very comprehensive, were deemed to be too costly by the Administration. The State Soil Conservation Committee was then requested to amend the criteria contained in those Standards in an effort to make them more cost effective. The evaluation team reconvened and revised their initial recommendations in an attempt to balance effectiveness and implementation cost.

At this time, the primary obstacle confronting the evaluation team is the assessment of the cost/benefit relationship between the implementation of the additional remediation criteria (which is passed on to the consumer) and the value of the benefits derived from doing so.



Soil Restoration  
Page Two

While the cost to implement is relatively easy to calculate, it is virtually impossible to calculate a monetary value of "benefits" derived. Quantities of soil and organic matter, as well as machine and labor times are all relatively easy to calculate. This cost valuation occurs directly at the point of application, namely a construction site just prior to completion.

Unlike the cost assessment, the benefit assessment is much more vague and ambiguous to define. Seasonal variations, topography, environmental and human activities which occur outside of and beyond the immediate application of the restoration measures are complex and it is difficult to assign a verifiable monetary value.

One of the inherent limitations of any benefit from the soil restoration measures developed is that the initial effects of "soil restoration" only last a few years without significant intervention and maintenance on the part of the property owner. The authority for implementation by the local soil conservation district ends when the construction process is finalized. Therefore, there is no way to ensure that the significant efforts used to improve the soil condition at the time of construction will be maintained and continued in perpetuity.

It should also be noted that these Standards are in place statewide, not just in the Barnegat Bay region, and are only required on new construction activities greater than 5,000 square feet. Since the majority of the Barnegat Bay watershed is already built out, only a small portion of this area could potentially benefit from revised soil restoration measures.

We have requested that both cost and benefit valuations be calculated (based on the revised, simplified version of the soil restoration measures) by various members of the review team for evaluation and comparison prior to submitting the revised Standards to the Governor's office for their review and comment.

We would be happy to provide you with a copy of the Standards and the cost/benefit analysis when we transmit them to the Governor's office.

Please feel free to contact this office if you have any further questions.

Sincerely,



Douglas H. Fisher



STATE OF NEW JERSEY

CHRISTOPHER J. CONNORS  
SENATOR - 9TH DISTRICT  
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October 10, 2014

BRIAN E. RUMPF  
ASSEMBLYMAN - 9TH DISTRICT  
AsmRumpf@njleg.org

DIANNE C. GOVE  
ASSEMBLYWOMAN - 9TH DISTRICT  
AswGove@njleg.org

Hon. Robert Martin, Commissioner  
NJ Department of Environmental Protection  
P.O. Box 402  
Trenton, New Jersey 08625-0402

RE: *Status of Soil Restoration Measures Standards Required to be Adopted Under the "Soil Erosion and Sediment Act"*

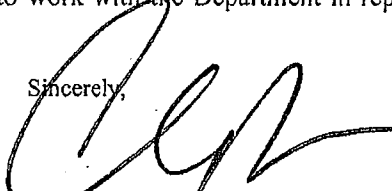
Dear Commissioner Martin:

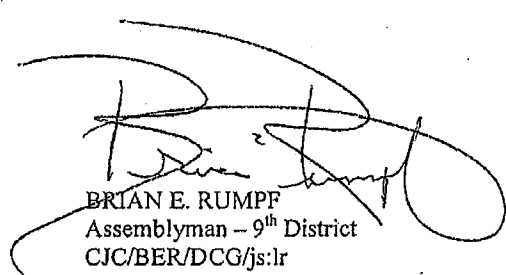
Through this communication, we are requesting a status update regarding the adoption of standards pursuant P.L.2010, c.113 (C.4:24-42.1 et al.) which requires the State Soil Conservation Committee to adopt standards modifying the current soil erosion and sediment control standards under "Soil Erosion and Sediment Control Act" to include soil restoration measures. The standards were to be adopted consultation with the New Jersey Agricultural Experiment Station at Rutgers, the State University, the Secretary of Agriculture and the Commissioner of Environmental Protection.

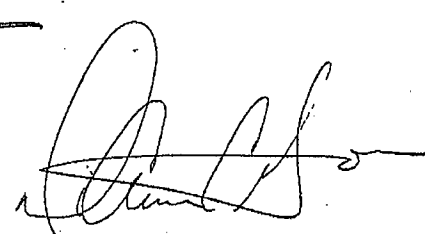
As Commissioner, you are fully aware that this law was enacted as part of a series of actions dedicated to enhancing protections for Barnegat Bay. As the 9th Legislative District includes a large portion of Barnegat Bay, the adoption of the new standards is of significant interest to a significant number of our constituents.

Thank you, in advance, for your attention to this important request for a status update. As always, our Delegation stands ready to work with the Department in representing the people of the 9th Legislative District.

Sincerely,

  
CHRISTOPHER J. CONNORS  
Senator - 9<sup>th</sup> District

  
BRIAN E. RUMPF  
Assemblyman - 9<sup>th</sup> District  
CJC/BER/DCG/js:lr

  
DIANNE C. GOVE  
Assemblywoman - 9<sup>th</sup> District

## **Costs vs. Benefits of More Rigorous Soil Restoration Efforts after Development: Justification for Strengthening the Soil Erosion and Sediment Control Standards**

Stephanie Murphy, Ph.D.

### **Introduction**

NJ's Soil Restoration Law ([www.njleg.state.nj.us/2010/Bills/PL10/113.PDF](http://www.njleg.state.nj.us/2010/Bills/PL10/113.PDF)) was passed by the legislature in 2010 and approved early in 2011. The original bill was four pages long and included not only specific plans and inspection requirements for post-construction restoration of degraded soil but also requirements for education and certification efforts. However, the final version of the approved legislation was less than two pages long, the pared down version saying in one sentence that:

"The [State Soil Conservation] committee shall...adopt standards...which shall modify the existing soil erosion and sediment control standards to include soil restoration measures" [where] "'Soil restoration measures' means those measures taken to ensure, to the maximum extent possible, cost-effective restoration of the optimal physical, chemical, and biological functions for specific soil types and the intended land use."

Soil compaction was the major concern driving this effort, since development activities impose unusually destructive activities and heavy loads on the soil in the form of construction equipment and traffic when the soil is bare and vulnerable, especially when wet. The term "compaction" is used in the legislation's definition of "disturbance":

"Disturbance" means any activity involving the clearing, excavating, storing, grading, filling or transporting of soil or any other activity which causes soil to be exposed to the danger of erosion, or compaction of soil which degrades soil so as to make it less conducive to vegetative stabilization."

In addition to the legislators who developed and voted for this law, Governor Christie also supported it; in fact, it is cited as one of the 10 points in his administration's Comprehensive Plan of Action to clean up and restore ecological health of the Barnegat Bay:

**#4. Requiring Post-Construction Soil Restoration** - The Administration will support pending legislation that requires the State Soil Conservation Committee to establish standards that ensure soil is restored to the greatest extent possible through aeration and re-vegetation to prevent soil compaction, which contributes to an increase in stormwater runoff and nonpoint source pollution in New Jersey's waterways. ([www.nj.gov/dep/barnegatbay/docs/barnegat\\_bay\\_10-ptsGOV.pdf](http://www.nj.gov/dep/barnegatbay/docs/barnegat_bay_10-ptsGOV.pdf))

In discussions of New Jersey's water quality efforts, this legislation is often coupled with the State's Turf Fertilizer Law ..., cited as Governor Christie's #3 point:

#### **#3. Reducing Nutrient Pollution from Fertilizer**

Governor Christie will sign legislation that establishes the most restrictive standards in the nation for nitrogen content in fertilizer and application rates for use, reducing excess nutrient runoff into the Bay by decreasing the total amount of nitrogen in fertilizer and increasing the amount of slow release nitrogen.

The link between the two Acts is in the phrase "nutrient runoff", which relates to the soil's ability to infiltrate (absorb) and transmit (percolate) water and therefore minimize water runoff (with any soluble or particulate nutrients). Infiltration and percolation rates are negatively correlated with soil compaction. As the NJ-DEP website (cited above) succinctly says, compaction "is a recognized contributing factor in stormwater runoff and nonpoint source pollution in New Jersey's waterways". Furthermore, compaction increases soil strength and decreases air exchange, creating unfavorable

conditions for plant root growth and proliferation. Poor vegetative success often leads not only to erosion, but also to continuous high input requirements such as irrigation, fertilization, and pesticides.

It is clear from the intent of the legislators (see sidebar) and the support of the Governor's administration and NJ-DEP that the policy leaders of New Jersey recognize the value of soil quality – the ability of soils to function as they would prior to disturbance. The major concerns regarding soil function with potential for immediate benefit include: ability to establish thriving vegetation cover to minimize erosion, maintenance of high water infiltration rate to absorb and store rainwater and minimize transport of sediment or other pollutants, and abundant activity of soil organisms which immobilize nutrients and decompose contaminants.

A working group was established in early 2011 by the State Soil Conservation Committee to develop the new Soil Restoration Standard. Because the proposed requirements would overlap with and/or need to be coordinated with requirements in other Standards, it was decided that Soil Restoration requirements would be satisfied by specific modifications in the existing Topsoiling Standard and Grading Standard. The main points of the changes involved alleviation of compacted soil and incorporation of organic matter. Depth of soil, maximum bulk density, soil testing, and appropriate management to ensure suitable post-construction vegetative establishment were other aspects addressed with respect to both the soil restoration law and the periodic updating process of the Standards for Soil Erosion and Sediment Control.

### Costs

Additional procedures and extra cost of materials which would be borne by developer (and ultimately purchaser). One early estimate, developed by Morris County Conservation District, was that the added restoration effort would cost \$16,000/acre. However, an estimate provided by a professional landscape contractor for the total post-construction landscape work (including both prior requirements and new requirements) was approximately \$6,000/acre. This suggests great variability in possible costs as one would expect with various sources of labor, materials, and equipment. Potential additional costs would be for purchase of compost where soil needs to be amended to increase organic matter content, trucking and spreading of compost, and/or performance of additional tillage to break up soil compaction and incorporate organic matter.

The difference in cost estimates cited also suggests that professional landscape contractors, who presumably have great investment, education, and/or experience in creating and maintaining stable landscapes, might also provide the most cost-effective work. While it might be argued that the Soil

“Erosion and sedimentation present serious problems to the water resources of the State. Removal of a stable ground cover in conjunction with the decrease in the infiltration capability of soils resulting from the creation of additional impervious areas accelerates the process of soil erosion and sediment deposition, resulting in water pollution. Some of these impervious surfaces are created from the soil itself, resulting from compaction due to the removal of topsoil and the weight of heavy machinery traveling over the land during development. If the soil is not restored to optimal conditions, the result will be decreased water infiltration and increased stormwater runoff, leading to further pollution of the State's waterways. By establishing standards for the restoration of soil health after land disturbance activities, water pollution will be reduced, and the State's water resources will be better protected for future generations.”

[www.njleg.state.nj.us/2010/Bills/A3000/2501\\_I1.PDF](http://www.njleg.state.nj.us/2010/Bills/A3000/2501_I1.PDF)

Restoration Law would cause economic hardship to developers, there is potential for a win-win situation where developers employ local professional landscape contractors to perform the final soil work and vegetation establishment.

As with many ecologically beneficial efforts, modern consumers are often willing to accept a higher property cost when it comes with recognizable advantages. While many homeowners and other property managers today struggle with landscape maintenance costs today because of compacted soils resulting from construction practices decades ago, soil restoration efforts on current construction sites can lead to lower management requirements, such as fertilizer, pesticide, and irrigation inputs.

### Benefits

The fact that a soil restoration law was conceived, developed, and passed by the legislature and signed by the Governor demonstrates that government leaders recognize the significance and importance of soil condition in developed areas. The whole justification for the law....Indeed the original purpose of the original Soil Erosion and Sediment Control Act (P.L. 1975, c.251, N.J.S.A. 4:24-39 et seq.)....The intensity of development, particularly along the Ocean County coastal area, has resulted in declining water quality and aquatic health, especially as documented in the Barnegat Bay.

The science of valuing ecosystem services is relatively young, but flourishing. Various methods are used to attempt assigning dollar amounts to the benefits that nature, left undisturbed, can perform for society. The functions of soil in the environment include not only primary production (food for nearly every heterotroph), but also serving as habitat for organisms, recycling of organic matter (including carbon and nutrients), carbon sequestration, water storage and filtering, flood abatement, and waste disposal/treatment. Most of these functions are eliminated when the soil is covered with impervious infrastructure or itself compacted to be nearly impermeable. Furthermore, natural amelioration of soil compaction is a long-term prospect, taking decades or even hundreds of years. In addition, depleted levels of organic matter in soil create nutrient-poor soils with low water-holding capacity and limited capacity to support vegetation and its associated soil biology. This situation then calls for certain inputs for optimum vegetative survival/performance at a cost to the post-construction property owner: fertilizers, irrigation, pesticides. Besides the costs associated with this management, potential for losses create a hazard that may be equal to the danger of soil loss/sedimentation in terms of water pollution.

The Legislature finds that sediment is a source of pollution and that soil erosion continues to be a serious problem throughout the State, and that rapid shifts in land use, from agricultural and rural to nonagricultural and urbanizing uses, construction of housing, industrial and commercial developments, and other land disturbing activities have accelerated the process of soil erosion and sediment deposition resulting in pollution of the waters of the State and damage to domestic, agricultural, industrial, recreational, fish and wildlife, and other resource uses.

It is, therefore, declared to be the policy of the State to strengthen and extend the present erosion and sediment control activities and programs of this State for both rural and urban lands, and to establish and implement ... a Statewide comprehensive and coordinated erosion and sediment control program to reduce the danger from storm water runoff, to retard nonpoint pollution from sediment and to conserve and protect the land, water, air and other environmental resources of the State.

**Soil Erosion and Sediment Control Act**  
(P.L. 1975, c.251, N.J.S.A. 4:24-39 et seq.)

<http://www.nj.gov/agriculture/divisions/anr/agriassist/chapter251.html>

So if it is recognized that hazards of degraded soils contribute to: higher input requirements for vegetation, nutrient and sediment pollution of water, sedimentation of lakes and rivers, and flooding, one can begin to conceive of the cost benefits to society. Figure the cost of soil amendments and irrigation to support plants in poor soil, additional water treatment required to remove sediment and nutrients, management of aquatic weeds or other pests related to nutrient load, dredging of lakes and rivers, flood abatement and disaster relief, and loss of tourism income due to poor water quality.<sup>1</sup>

Costs to the developer would provide strong incentive for disturbed land area to be minimized. This would conform to current concepts of low-impact development, recognizing that alteration of existing landscapes often lead to lower ecological health/status.

As stated earlier, benefits to the State's economy are also possible by developers subcontracting out landscape-finishing work to local landscape professionals – not just installation of turf, trees, and ornamentals, but the soil preparation work as well. Trained landscape professionals/business owners understand the need for good soil conditions and have the incentive to produce long-term sustainable landscapes.

"The proposed amendments, that prescribe the Soil Erosion and Sediment Control Act rules, will have a favorable impact on the public by reducing the loss of soil and preventing sediment damage from construction, mining, and other land disturbances. Protection of water quality will continue. Persons engaging in land disturbances will be required to prevent offsite damages at their own cost, thereby eliminating or reducing public costs for correcting such damages."

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ISSUE DATE: AUGUST 6, 2012

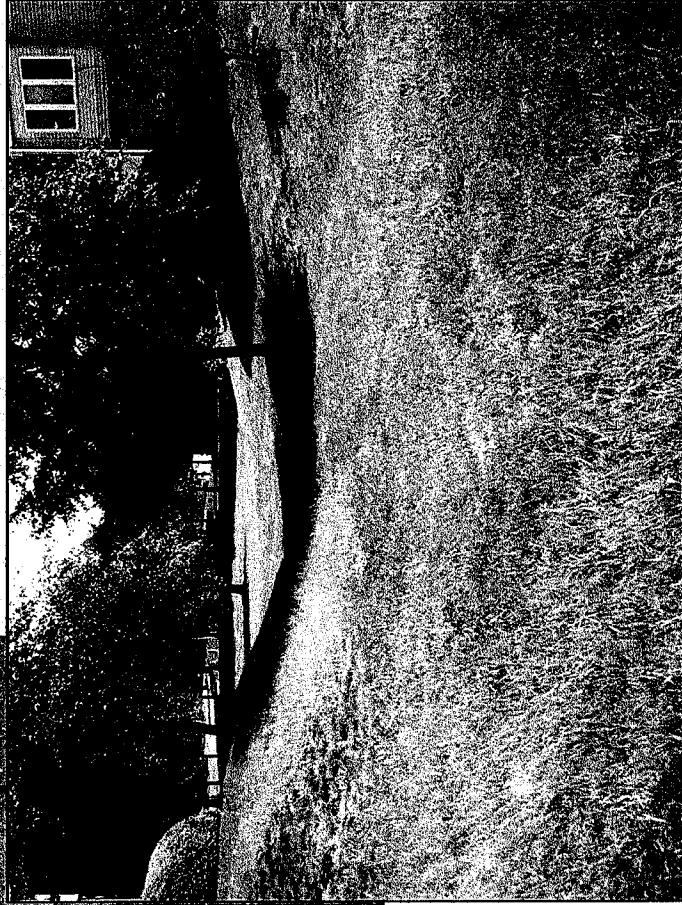
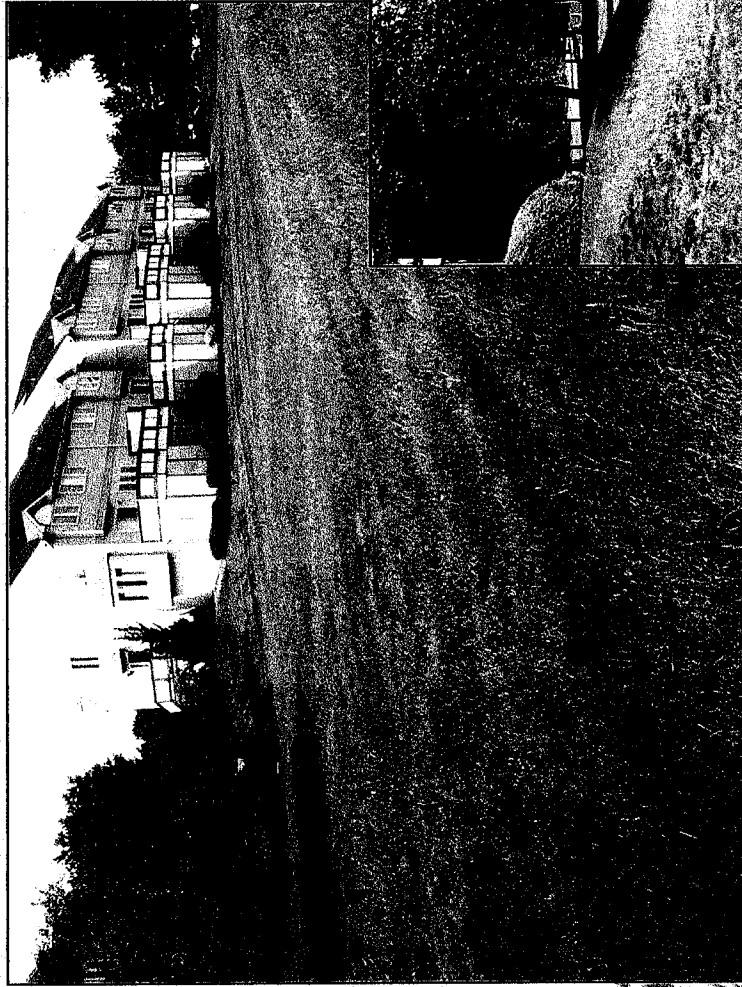
Further, we can project that the possible need to enhance soil organic matter content will increase demand for high quality compost. While there may be a lag period in supply, the demand is likely to provide economic incentive for the composting industry in the State. Certainly there is much organic waste/byproduct in the State that is not being fully utilized for its potential benefits. The potential demand for good compost also benefits compost suppliers but also society at large as the industry develops improvements and efficiencies in treating and handling waste products.

Other Possible economic benefits...

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<sup>1</sup> Society is currently protected from the full costs because of current SESC Standards. A real difficulty lies here in the comparison of what those costs to society are with current Standards versus what they might be under more rigorous Standards.

# LAUREL COMMONS



Pre-Existing Conditions

pH

# LAUREL COMMONS

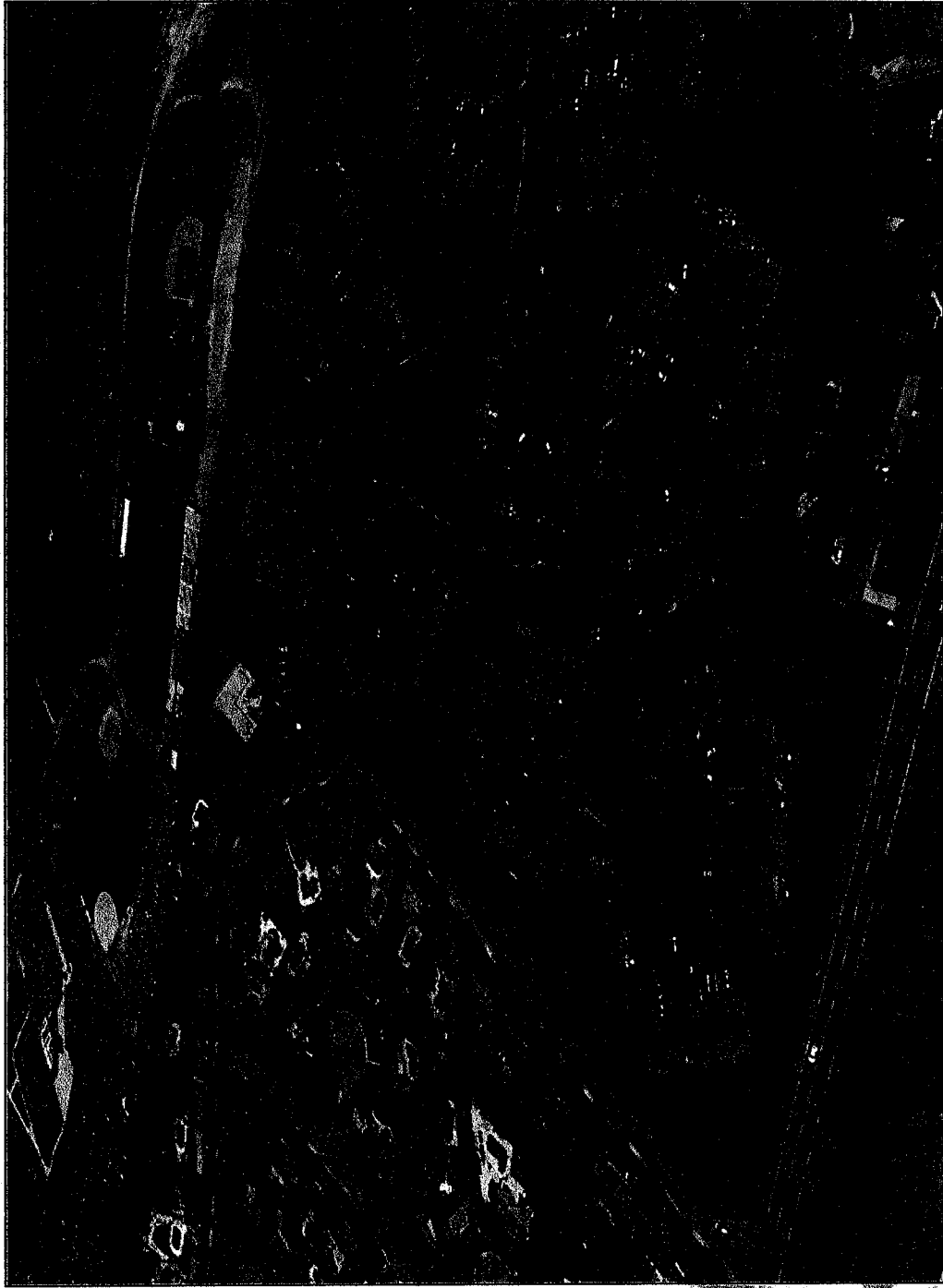


Pre-Existing Storm Conditions

pH



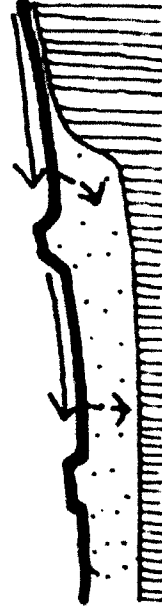
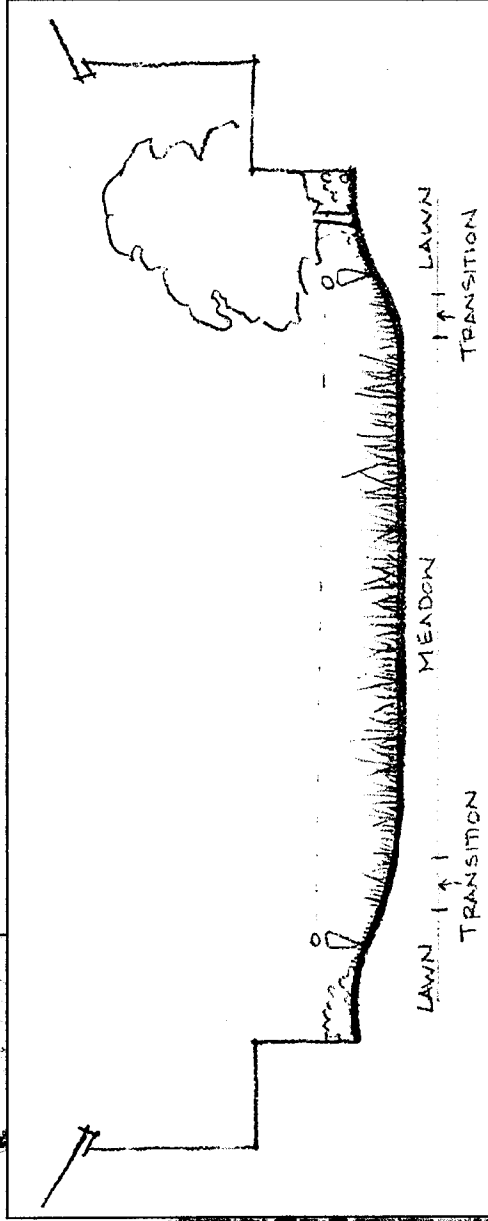
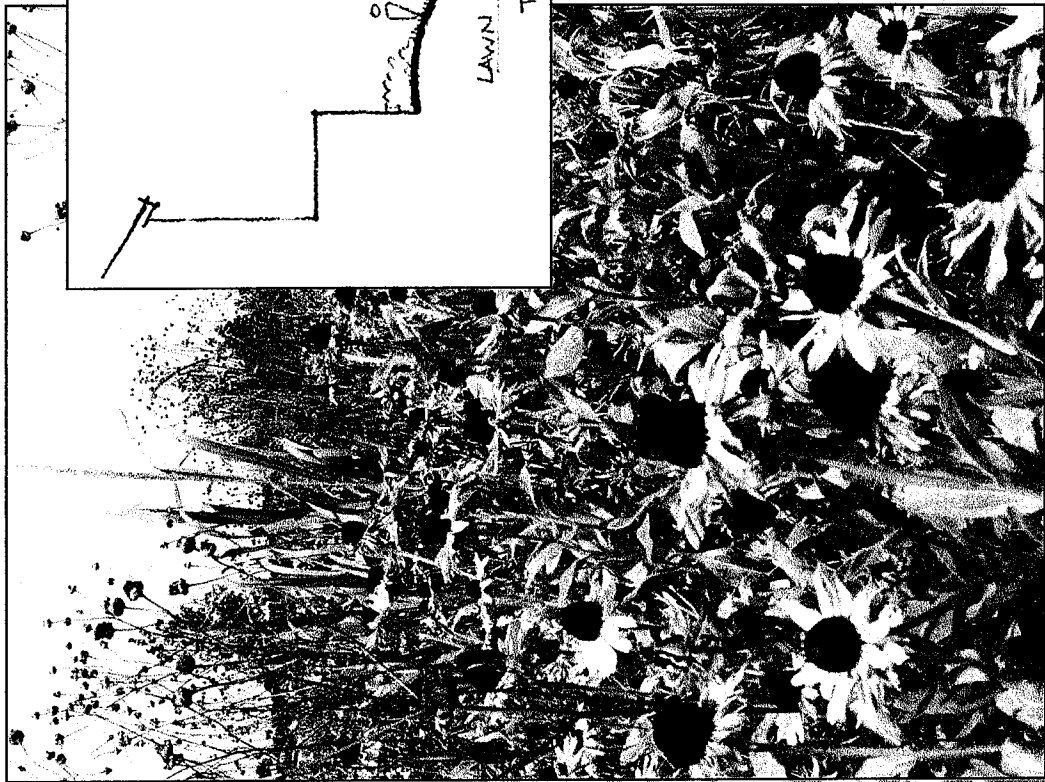
# LAUREL COMMONS



Drainage Area

pH

# LAUREL COMMONS



Use roads, berms, and checkdams in swales to impound runoff by blocking flow over permeable soils.

**pH**

**Concept Plan**

# LAUREL COMMONS

- Thin veneer of sod on a layer of highly compacted sandy loam
- No root penetration or earthworm activity present
- Underlain by coarse sand
- Adequate separation from groundwater



**Soil Investigation**

**pH**

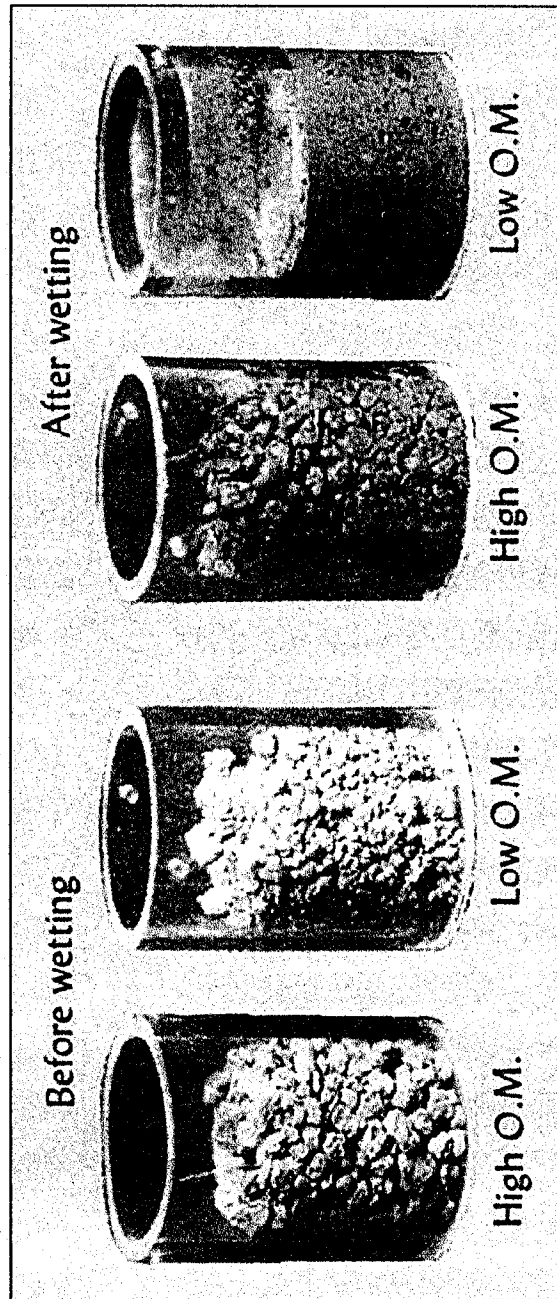
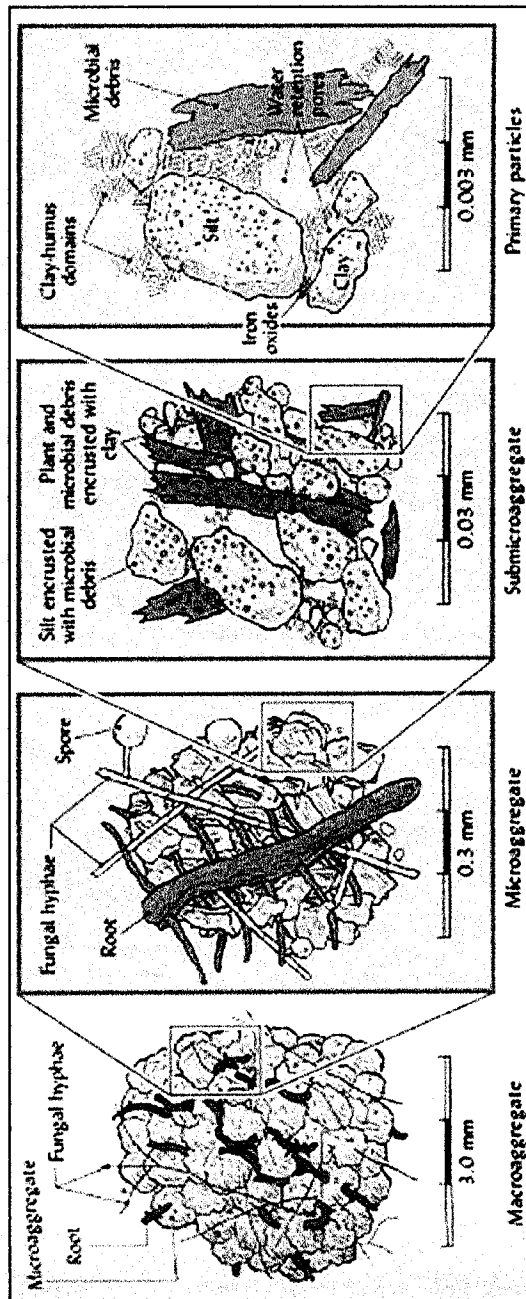
# IMPORTANCE OF SOIL

Sometimes sod isn't  
the best approach, and  
by "sometimes" I mean  
all the time.



pH

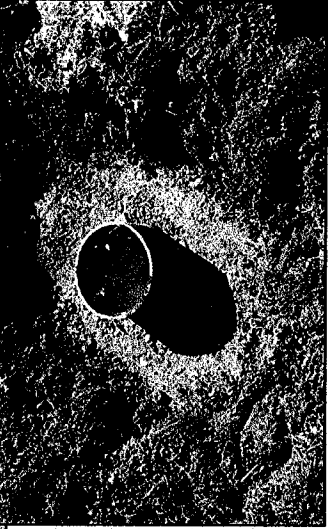
# IMPORTANCE OF SOIL



The Nature and Properties of Soil

pH

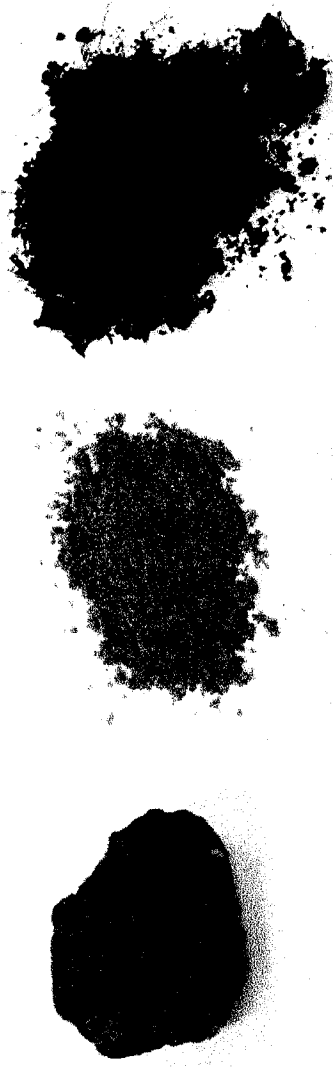
# LAUREL COMMONS



Soil Investigation

pH

# LAUREL COMMONS



**Compacted Layer**      **Native Sand**      **Post Remediation**

**USDA Texture**

Sandy Loam

Sand

Loamy Sand

**Bulk Density  
(g/cc)**

1.9

1.6

<1.6

**Organic Matter  
(%)**

2.2

NT

6.0

**Hydraulic  
Conductivity (in/hr)**

<0.1

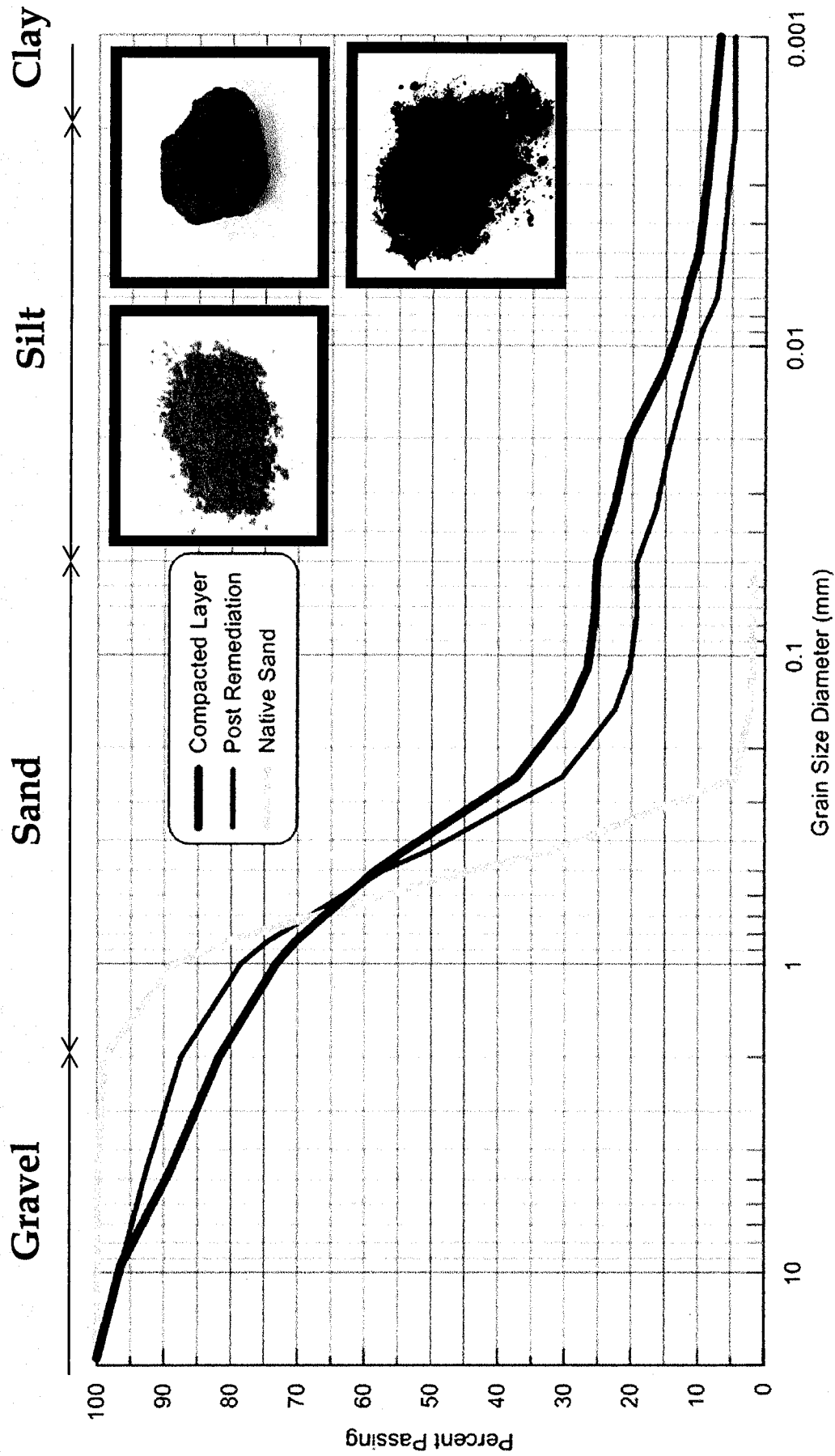
6.0

1.1

**Soil Investigation**

**pH**

# LAUREL COMMONS

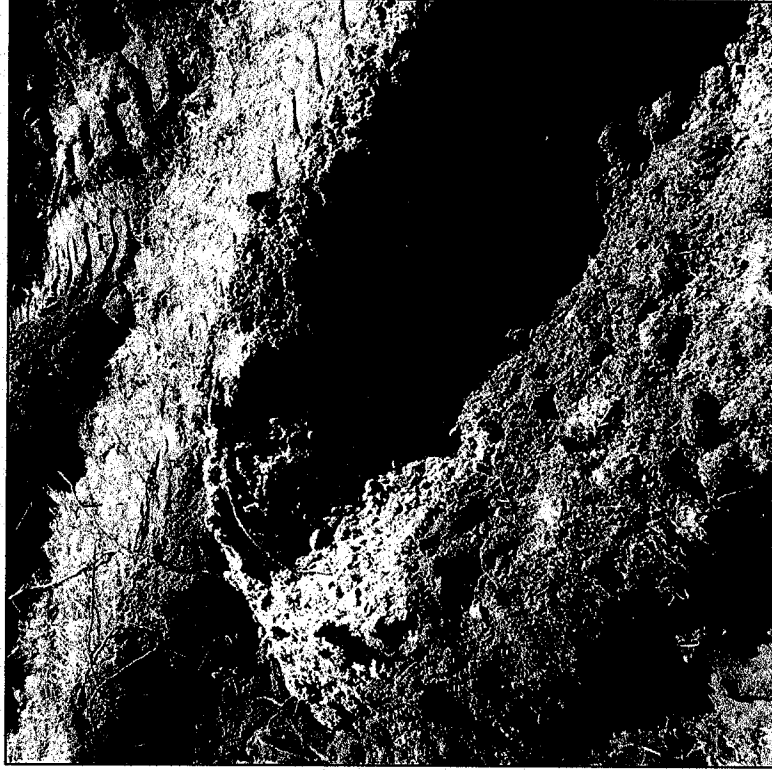
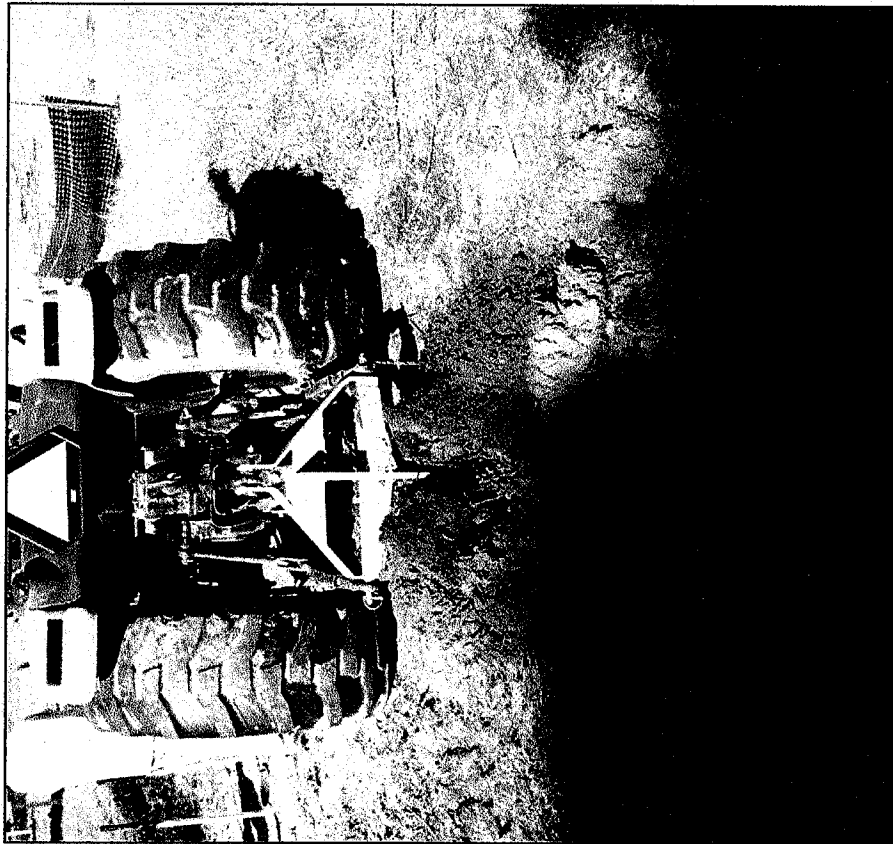


Soil Investigation

pH



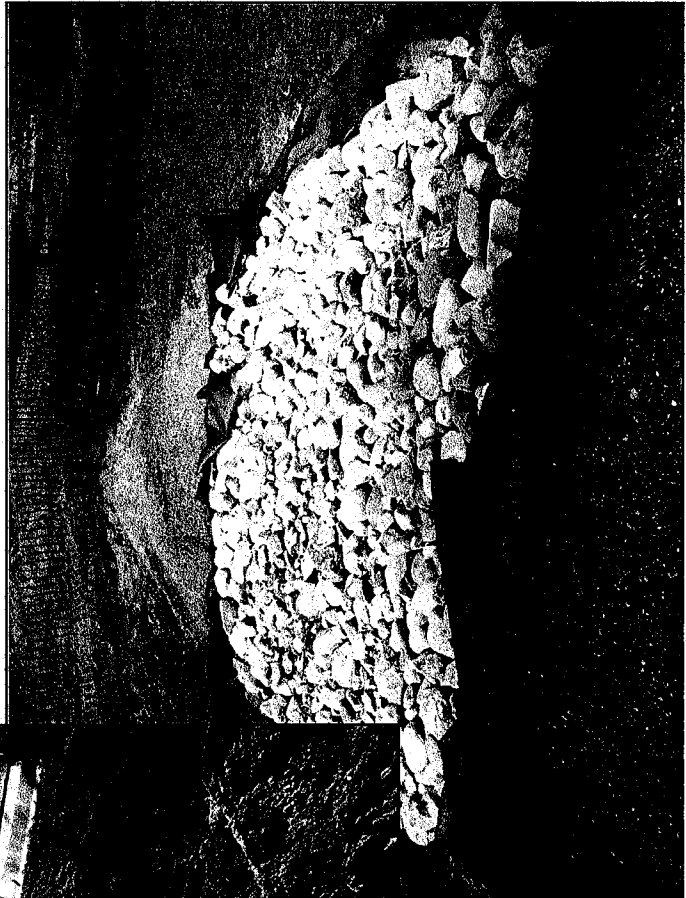
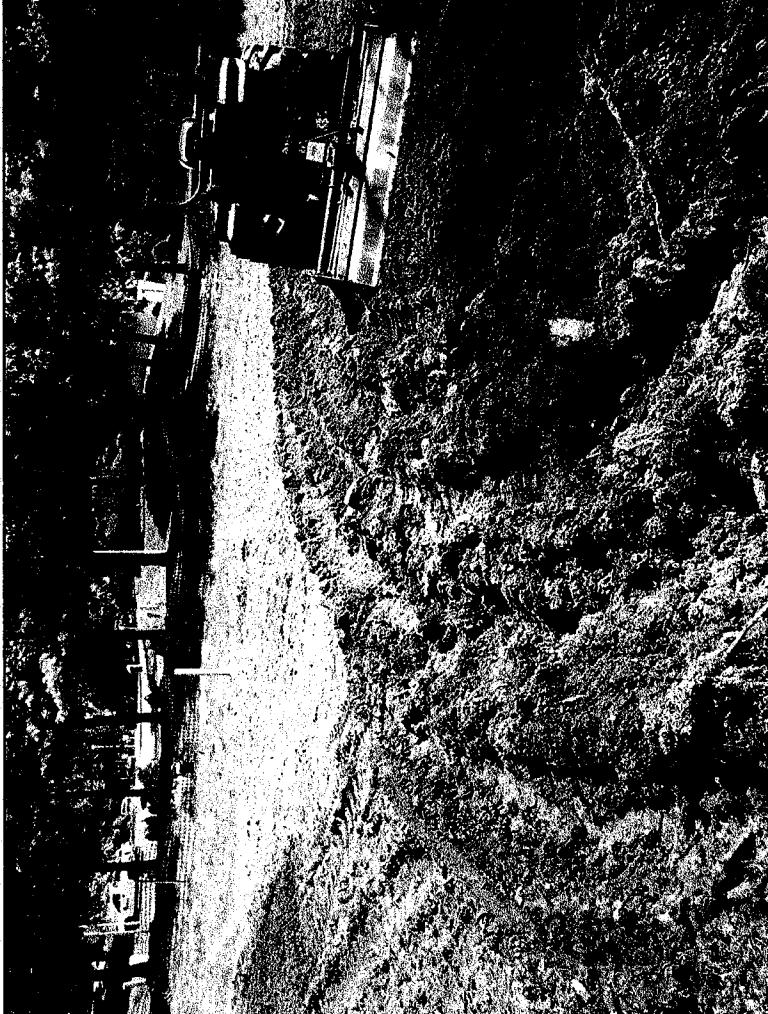
# LAUREL COMMONS



Construction

pH

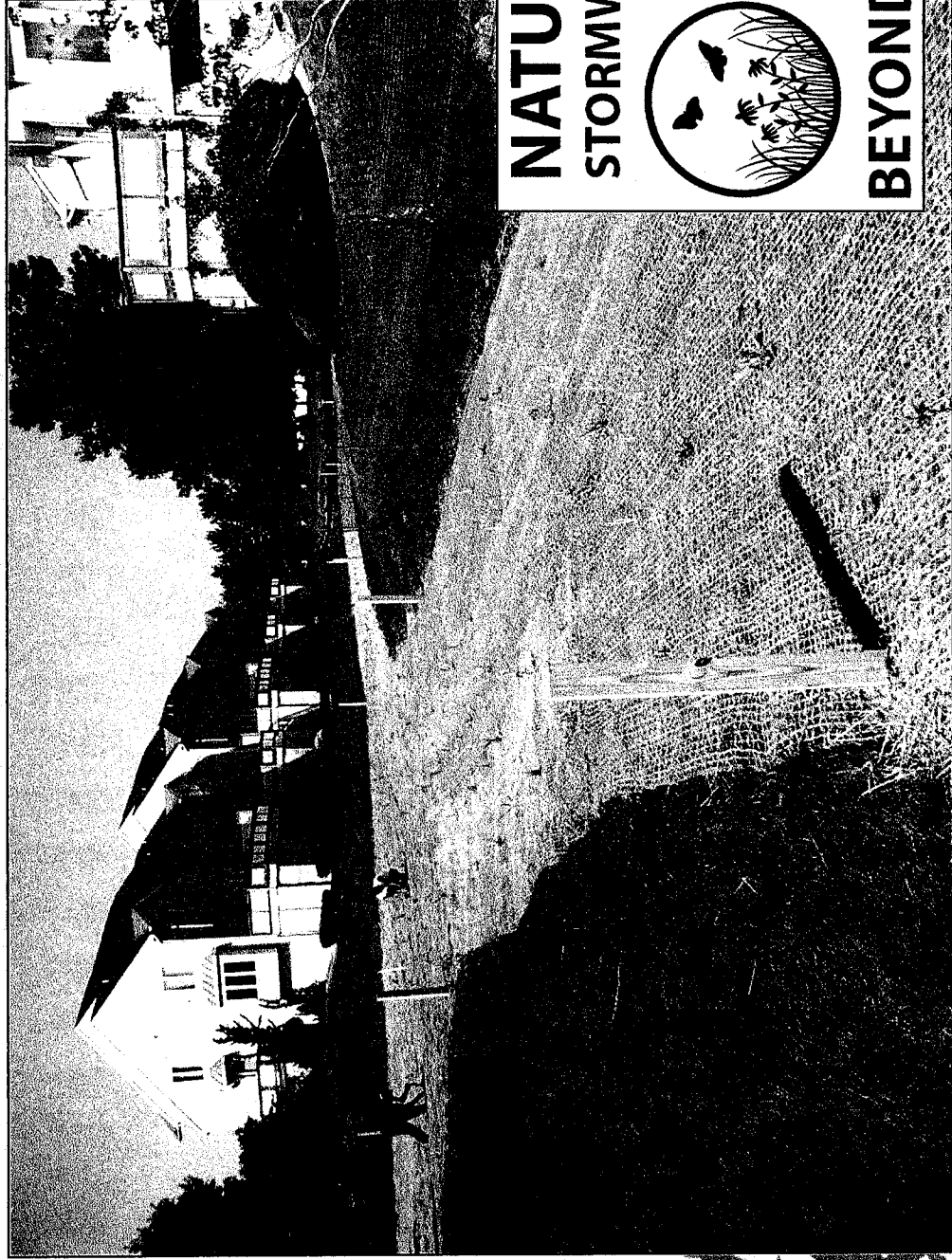
# LAUREL COMMONS



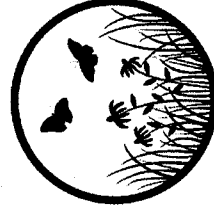
Construction

pH

# LAUREL COMMONS



**NATURALIZED  
STORMWATER BASIN**



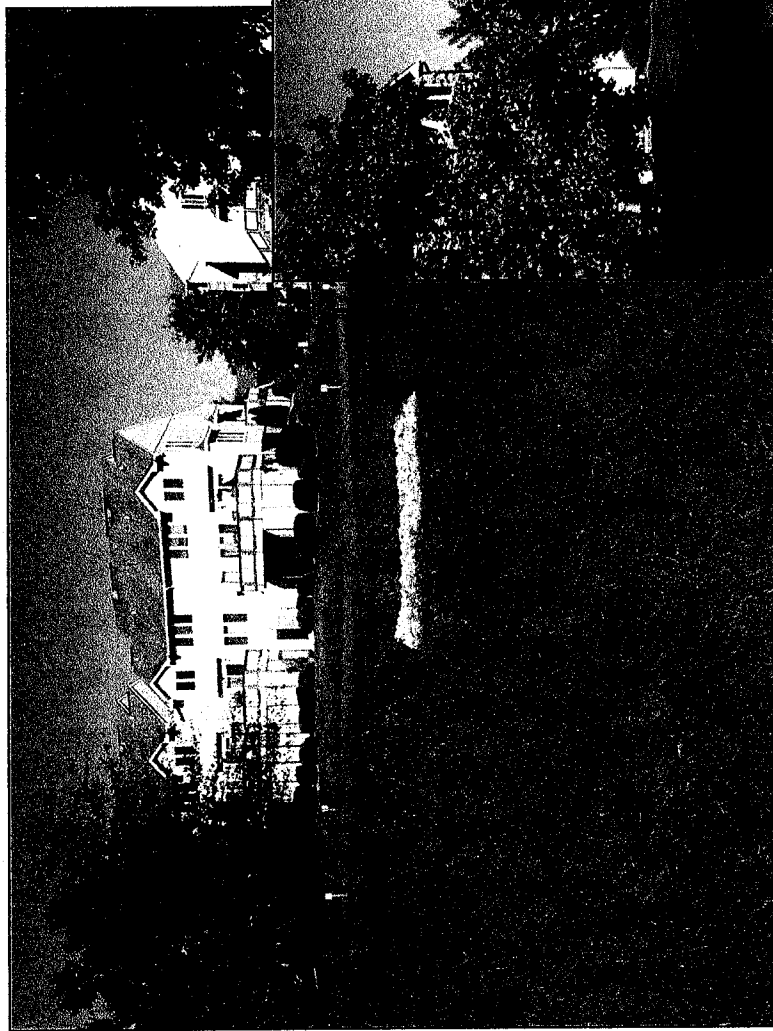
**DO NOT  
MOW**

**BEYOND THIS SIGN**

**Construction**

**pH**

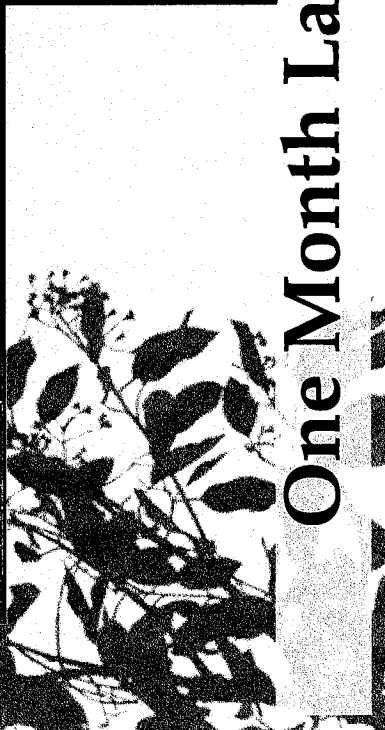
# LAUREL COMMONS



One Month Later...

pH

# LAUREL COMMONS



One Month Later...



pH





25x









27x





# Rain Garden Helps Restore Barnegat Bay

**C**ommunity Medical Center, along with the American Littoral Society and other partners recently scored another run for cleaner water in Barnegat Bay with a newly renovated stormwater basin. Located on the grounds of Community Medical Center, the basin retrofit – known as a ‘bio-retention’ – is a type of rain garden that will help reduce polluted stormwater runoff going into the Bay.

Polluted stormwater, carrying fertilizers and other pollutants from development has been identified as one of the major contributors to the decline of Barnegat Bay.

“We’re very excited to build upon our partnership with the American Littoral Society and be involved with this important project,” said Stephanie L. Bloom, FACHE, President and Chief Executive Officer, Community Medical Center.

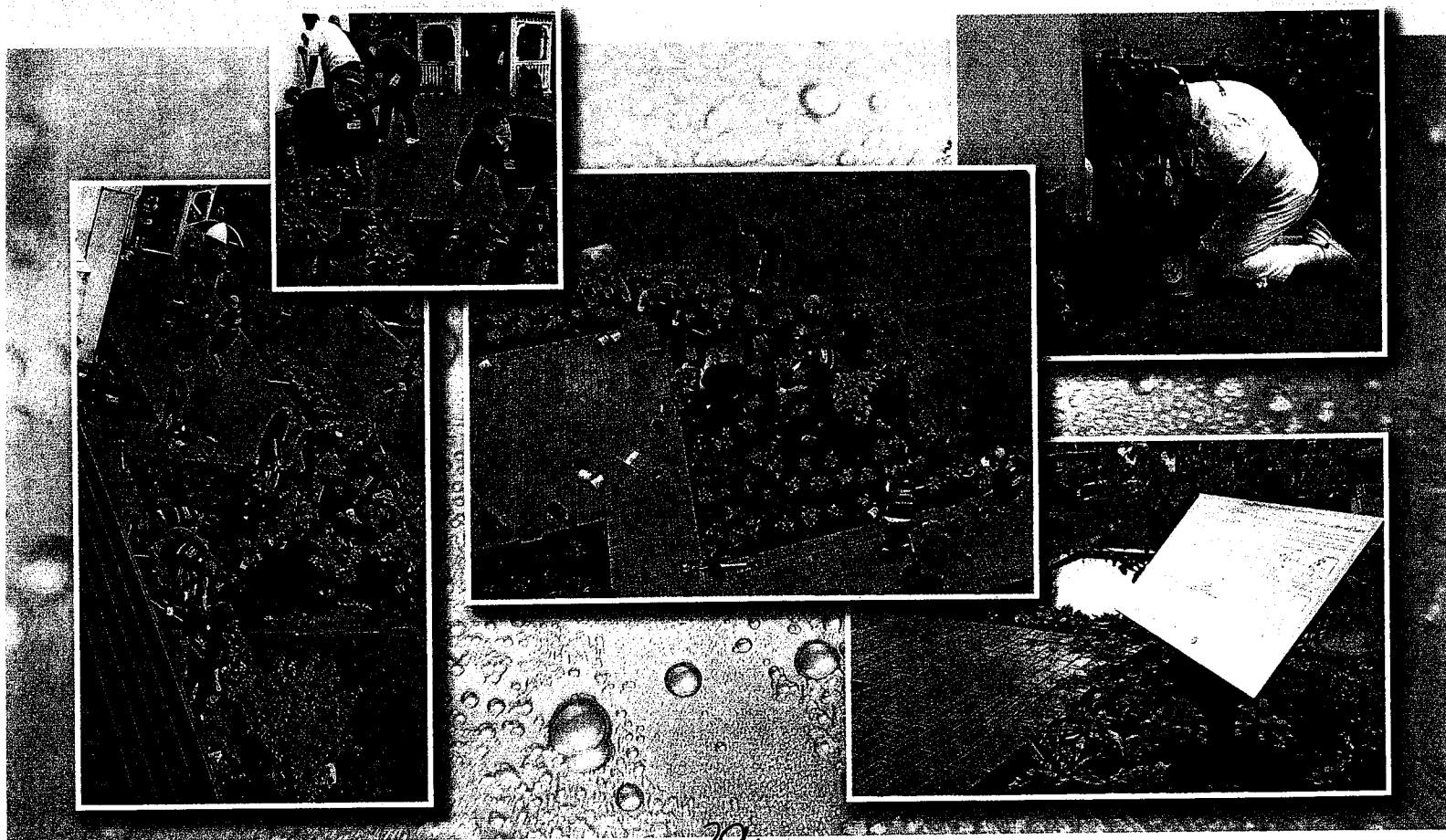
**“Helping to protect Barnegat Bay for generations to come is important to everyone at Community Medical Center.”**

“Keeping the bay healthy keeps Ocean County residents healthy, by assuring they have a place for exercise and recreation. Our mission is to improve the quality of life for people in our community and this project will help us do that,” she added.

The Community Medical Center rain garden is the second in a series of basin retrofits and other green infrastructure improvements to be implemented by the American Littoral Society and its partners as part of a 3-year project funded through Watershed Restoration 319(h) Grant from the New Jersey Department of Environmental Protection.

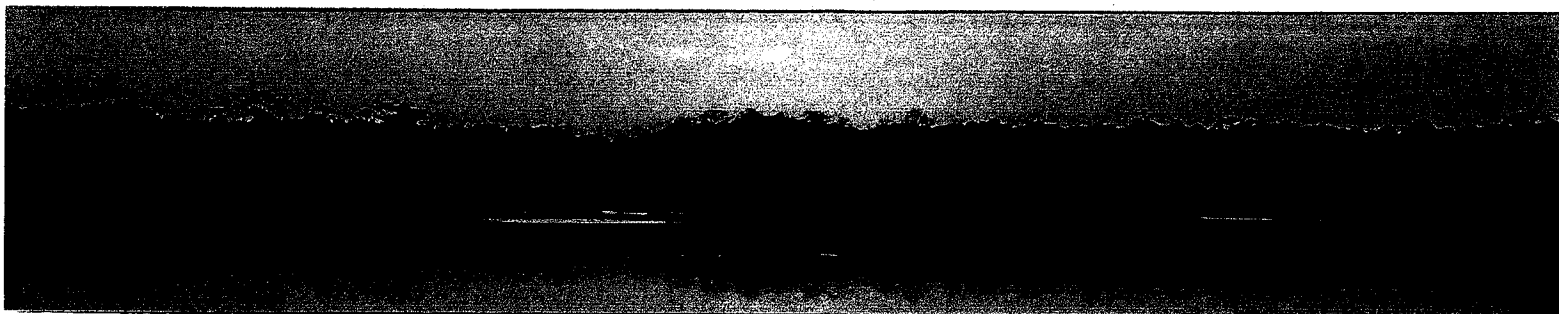
Originally, the basin was a grassed area with compacted soils and frequent flooding problems. Now, soils have been decompacted and new vegetation will function as a rain garden planted with beautiful native flowering plants provided by Lowe’s Home Improvement stores. The area also boasts new eco-pavers to accommodate an outside sitting area at the hospital.

To learn more about this project and how individuals and communities can secure cleaner water for Barnegat Bay, visit [www.littoralsociety.org](http://www.littoralsociety.org).

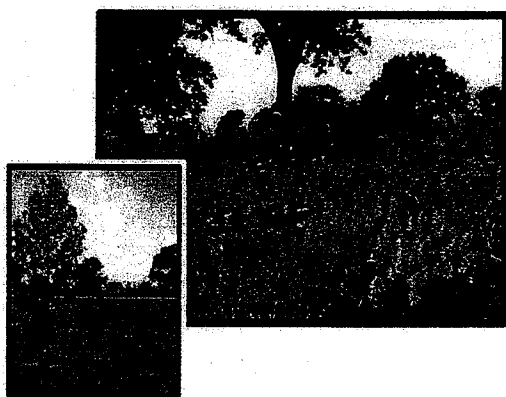


# Barneget Bay Clean Water Project

Reducing Polluted Runoff Into Long Swamp Creek, The Toms River and Barneget Bay



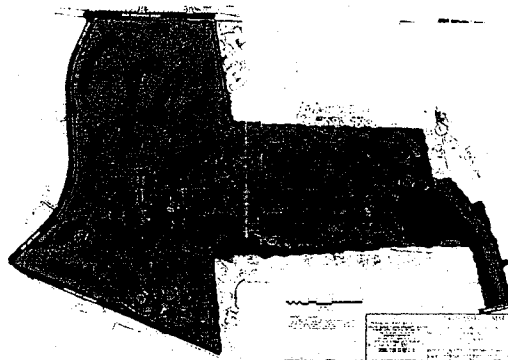
**Green Infrastructure** is an approach to water management that protects, restores, or mimics a natural system. It incorporates both the natural environment and engineered systems to provide clean water, conserve ecosystem values and functions.



A **Bio-retention Basin** is a type of green infrastructure that enhances soils by breaking up compacted layers and incorporating organic matter. Turf grasses are replaced with native plant material, creating an attractive and low-maintenance meadow area. This "green infrastructure" reduces pollution and minimizes flooding through infiltration of stormwater.

Working with and enhancing natural landscape features is key to improving water quality, flood control and resiliency.

Environmentally friendly land management programs such as our "Bay-Friendly Golf Course" certification can be implemented.



**Green Infrastructure** is utilizing both our natural and built environments

Parking Lot  
Vegetated Swale



Green Roof



Eco-Pavers



Porous Pavement



Funding for this project provided through a Watershed Restoration 319(h) Grant from the New Jersey Department of Environmental Protection (Grant # RP11-038)

**Photo and Content Credits:**

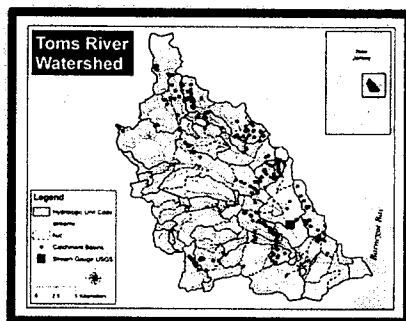
[water.epa.gov/infrastructure/greeninfrastructure/index.cfm](http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm)  
[www.Phillywatersheds.org](http://www.Phillywatersheds.org)  
[www.americanrivers.org](http://www.americanrivers.org)  
[www.asla.org/](http://www.asla.org/)  
[www.princetonhydro.com](http://www.princetonhydro.com)

# Barnegat Bay Clean Water Project

Reducing Polluted Runoff Into Long Swamp Creek, The Toms River and Barnegat Bay



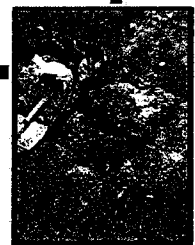
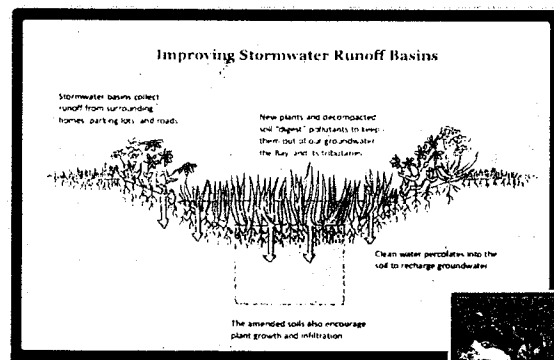
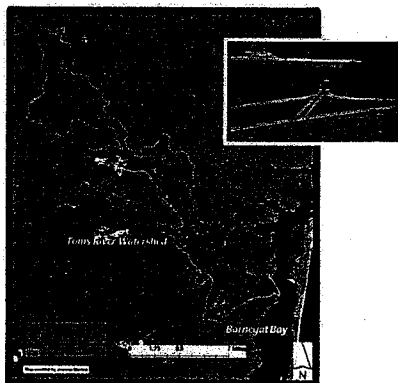
**Clean and Abundant Water** is the lifeblood of any community. In 2010, the American Littoral Society launched a clean water project to improve water quality in Barnegat Bay. Our goal is to reduce pollutants from stormwater runoff, especially nitrogen and phosphorus. The result of overdevelopment in the watershed, these pollutants have caused the bay to become degraded, making it less and less able to support native fish, shellfish, invertebrates, and aquatic plants. Large algae blooms and stinging sea nettles are more common and increasing.



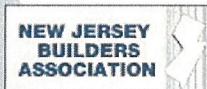
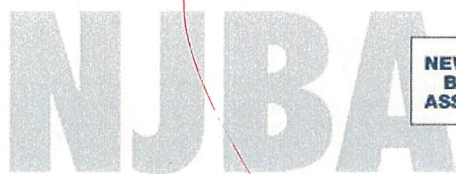
**The Society and its Project Partners** are developing new tools, implementing demonstration projects, and creating educational programs that can be used by towns, businesses and individuals throughout the Barnegat Bay watershed. When implemented, these measures will yield cleaner and healthier water for people and wildlife.

**Improving the Pollutant Removal Ability** of stormwater basins throughout the Bay's watershed by retrofitting them will result in cleaner water.

The **"Basin Prioritization Matrix"** tool developed as part of this project facilitates investments that will achieve the greatest ecological impacts.







www.njba.org  
www.abconvention.com  
www.njmx.com  
www.foundationforhousing.com

**TO: MEMBERS OF THE ASSEMBLY ENVIRONMENT AND SOLID WASTE  
COMMITTEE AND THE SENATE ENVIRONMENT AND ENERGY  
COMMITTEE**

**FROM: GEORGE VALLONE, NJBA PRESIDENT**

**DATE: AUGUST 10, 2015**

**RE: SOIL RESTORATION STANDARDS**

The New Jersey Builders Association (NJBA) appreciates the opportunity to submit the following comments regarding the need for Soil Restoration Standards.

Over the past several years, NJBA members have been involved in the deliberative process to develop revisions to the Soil Erosion and Sediment Control Standards, specifically for the Topsoiling and Land Grading Standards. That process was established by the Department of Agriculture's State Soil Conservation Committee to ultimately amend the 1999 Standards in order to comply with the requirements set forth in the 2010 Soil Restoration Law (P.L. 2010, Chapter 113).

NJBA members are directly impacted by any changes to these two existing Standards. Amendments to the Standards would likely require changes to our current development practice to ensure compliance. Further, developers would be subject to potential enforcement measures taken to address deficiencies. Therefore, we appreciate the Department of Agriculture's ongoing efforts for rulemaking, while also addressing the practical concerns raised by stakeholders, including the regulated community. This approach would achieve the objectives of the Soil Restoration law regarding soil health and compaction, while also complying with the law's mandate that such "soil restoration measures", with which the development community would need to comply, are "to the maximum extent possible, cost effective measures..."

The NJBA supports the Department of Agriculture's rulemaking process and looks forward to continuing that process to completion. Thank you for the opportunity to present our position on the need for Soil Restoration Standards.

#### New Jersey Builders Association Officers

GEORGE T. VALLONE *President* • CAROL ANN SHORT, ESQ. *Chief Executive Officer*  
DWIGHT W. PITTENGER, ESQ. *Vice President* • JOHN H. KIRKENIR *Treasurer* • THOMAS F. TROY *Secretary* • COREY T. WESCOE *Builder Vice President*  
JEANNE TOMLINSON *Associate Vice President* • JOHN J. HEALEY 2<sup>nd</sup> *Associate Vice President*  
MICHAEL J. GROSS, ESQ. *Environmental Counsel* • ROBERT M. WASHBURN, ESQ. *General Counsel* • THOMAS F. CARROLL III, ESQ. *Land Use Counsel*

200 American Metro Boulevard • Suite 123 • Hamilton, NJ 08619 • P: 609.587.5577 • F: 609.587.0044

# Save Barnegat Bay Summer 2015

## Current Threats

5% or 18,000+ Acres Sewer Service Area & Future

Wastewater Service Areas Source: APP 2015

Soil Restoration Standards have stalled

Lack of Quantitative Standards for Nitrogen & Phosphorous

Dept. of Transportation Pump Stations (Rte 35 & 72)

## Advocacy Campaigns

Barnegat Bay Bills \*list on reverse side

Impairment Post Card Campaign

Fertilizer Challenge on website

Assist Neighbors fighting the good fight

Jersey Native - Dept of Agriculture

## Projects

Sedge Island Conservation Zone Map

Forsythe Refuge Trail Interpretive Signs

Pete McLain Collection

Stream Crossing Signs

## Partnerships

Barnegat Bay Partnership

Environmental Summit

## Grants

LBI Garden Club

Friends of Island Beach State Park

Norcross Foundation

## Nitrogen load estimates by source:

### Total Nitrogen

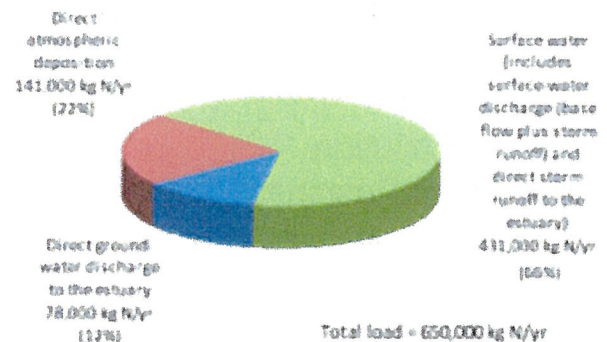
Load = 650,000 kg/yr

### Stream discharge (including base flow and storm runoff)

- 62% surface water discharge - 405,000 kg/yr

### Direct to estuary

- 4% storm runoff - 26,000 kg/yr
- 12% groundwater discharge - 78,000 kg/yr
- 22% atmospheric deposition - 141,000 kg/yr



Source: USGS 2009



Save Barnegat Bay  
725-B Mantoloking Road  
Brick, NJ 08723  
732-830-3600

## Barnegat Bay - Little Egg Harbor Estuary

Shallow, poorly flushed, lagoon system  
susceptible to impacts of nutrient enrichment

### Over Development

660 square miles

600,000 people

<2% agriculture

Few Point Sources

[www.savebarnegatbay.org](http://www.savebarnegatbay.org)



## **2015 Programs, Campaigns & Projects**

### **Signature Education & Outreach Programs**

Student Grants

Jersey Shore Science Fair Award

Herbarium & Janet's Garden

Barnegat Bay Defenders

Bay Action Environmentalists

This Way to Barnegat Bay

Enviroscape in the Watershed

We are All Connected

Barnegat Bay Associates

Learn & Discover with Us!

Speaking Engagements - Barnegat Bay at a Crossroads

Pod Sci

Volunteer Programs

Tabling Opportunities

Special Events

### **Advocacy Campaigns**

Nutrient Pollution \*

Impairment Postcard

Fertilizer Challenge

Barnegat Bay Bills

Legal Actions

IWL v. Hamilton Estates

SBB v. Ocean County College

SBB v. State of New Jersey - Lacey Rail Trail

SBB v. State of New Jersey - CDF Dock Road - Amicus Brief

SBB v. Six Flags Great Adventure, Jackson Township

### **Projects**

Organic Herbicide

Stream Crossing Signs

### **Support for Partner Organizations**

Barnegat Bay Partnership

Environmental Summit

## **2015 Barnegat Bay Bills**

### **S2004/A3305 DOT Native Vegetation**

This bill would require the DOT, NJTA, and SJTA to use only native vegetation for landscaping, land management, reforestation, or habitat restoration.

### **S1031/A1203 Phosphorous in Detergents**

Requires labeling of ingredients and restricts phosphorous in household cleansing products.

### **S1029/A1202 Urea in snow melts**

Prohibits sale, distribution, and use of urea as an ice melt.

### **S1492/A2507 Require DEP to adopt TMDLs**

This bill would require the DEP to adopt a total maximum daily loads for the Barnegat Bay ecosystem.

### **S1493/2506 DEP to develop Nutrient Standards**

This bill would require the DEP to adopt total maximum daily loads for the Barnegat Bay ecosystem, and require the DEP to adopt nutrient standards for New Jersey marine waters.

### **S943/A3297 Stormwater Basin Adoption**

Allow a business entity or nonprofit organization to adopt certain responsibilities related to a stormwater management basin by entering into an agreement with the State or local government agency having ownership or control over the stormwater management basin.

### **S820 Stormwater Utility**

Authorize municipalities and municipal utilities within Ocean County to establish a stormwater utility for the purpose of creating a stormwater management system to manage the stormwater runoff of the municipality.

### **S502/A1213 Barnegat Bay Protection Plan**

Establishes a fund dedicating a portion of sales tax on fertilizer, authorizes special license plates, and provides for donations.

### **S499/A2730 Removal of Lawns near Barnegat Bay.**

Provides state income tax credit for removal of lawns near Barnegat Bay.

*\*\*\*Needs to be revised as stone yards are not the solution. We need native plants to absorb the nitrogen.*



## Barnegat Bay-Little Egg Harbor

- Is bounded by a nearly continuous barrier island complex and an extensively developed watershed, making it susceptible to pollution inputs as well as other human and natural stressors.
- Has become eutrophic- the artificial enrichment of an aquatic system by the addition of nutrients. The effect is often unintentional and harmful, indirectly causing the death of aquatic plants and animals. Eutrophication poses the most serious threat because it creates the potential for ecosystem-wide decline, affecting the long-term health and function of the entire system, impacting living resources, essential habitat, and human resources throughout. Eutrophication is potentially permanent.
  - Low dissolved oxygen
  - Harmful algal blooms
  - Loss of essential habitat
  - Reduced biodiversity
  - Declining fisheries
  - Imbalanced trophic food webs
  - Declining system stability and resilience
- Studies of coastal lagoonal systems indicate that environmental impacts escalate as population growth, development, and the amount of impervious cover increase in surrounding watersheds
- Estuary condition has escalated from moderately eutrophic to highly eutrophic over the past decade
- Nitrogen is the most problematic nutrient element responsible for this deterioration, although phosphorus also plays a role during certain time periods and must be considered as well.
- **Total surface water loads of nitrogen and phosphorus as high as 1,889,362 lbs and 70,548 lbs**
- Accumulation of large amounts of decaying algae on the estuarine floor not only leads to hypoxic conditions but also the production of sulfides in bottom sediments mediated by microbial activity that can be extremely toxic to bottom-dwelling communities
- **Major findings by 2013 Rutgers study:**
  - Estuary that has undergone significant ecological decline through time. The strong positive relationship between nutrient loading from the watershed and estuarine nutrient concentrations, the degradation of an array of biotic indicators, and the relationship between nutrient loading and the Index of Eutrophication supports this finding.
  - Is sensitive to small increases in nutrient loading due to its extreme enclosure and a watershed to estuary areal ratio of 6.5:1.
  - Nutrient loading to the estuary has increased with watershed development. Urban land development and increasing impervious cover are responsible for nutrient levels that are elevated above background levels.
  - North segment of BB-LEH is designated as impaired for dissolved oxygen (DO) and remains on the Clean Water Act 303d list for impairment. However, greater numbers of low DO occurrences were recorded in the central and south segments of the estuary than in the north segment, over the 1989-2010 study period.
  - Hard clam harvest recorded in the estuary decreased by more than 98% between 1975 (1,402,942 lbs) and 2005 (15,036 lbs). The number of commercial clam licenses for the system has declined significantly through time due to low clam abundance.
  - Abundance of the sea nettle increased dramatically over the past decade, with blooms commonly observed in the north segment of the estuary since 2004. Large numbers of sea nettles have posed a hazard to human use of some estuarine areas. Sea nettles also consume large quantities of zooplankton and thus may shorten the food chain, potentially altering energy flow and impacting organisms.
- **A well-coordinated, long-term management plan is important for improving the ecological condition and resources of BB-LEH.**
- **Generating nitrogen and phosphorus numeric standards for the estuary and establishing Total Maximum Daily Loads (TMDLs) for nitrogen and phosphorus are two ways of managing and mitigating the eutrophication problems.**



# Bryce Bennett • Landscape Architect

MEMBER of the AMERICAN SOCIETY of LANDSCAPE ARCHITECTS  
New Jersey Licensed Landscape Architect No. 366

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P.O. Box 1911 • Toms River, NJ 08754-1911 • LandscapeArchit@aol.com

2 January 2014

**Save Barnegat Bay**  
725B Mantoloking Road  
Brick, NJ 08723

## **Re: NJDOT Route 35 Reconstruction Plans – Landscape Review**

### **To Whom It May Concern:**

I have reviewed the rather voluminous plans of the Route 35 Reconstruction project with respect to the Landscape Plans portions of the Construction Plans and wish to report on its content.

It would seem that the primary opportunity of creation of an important vegetative corridor through the middle of the barrier island has been missed. Route 35 is the central vehicular spine but could also have been designed as a more continuously vegetated parkway or true boulevard. The larger missed opportunity appears to be the failure to envision Route 35 as a potential, significant ecological feature in transect from ocean beach, through its “upland” middle, to the bayshore.

This barrier island has been transformed by Hurricane Sandy. Collectively, we are creating a new continuous dunescape of sorts up and down the oceanfront. While it will not look like the natural fore and back dunes of Island Beach State Park, time, and nature’s dynamic influence will likely help to diversify and make this feature an ecologically significant change in the environment.

The bayfront varies with some undeveloped stretches, but is largely composed of residential development and lagoons. It is a disturbed environment and one where the heretofore, relative constants of scenery are now changing through elevation of dwellings and businesses. The shoreline itself is, however, unlikely to revert to a natural state.

As privately owned land, within regulatory constraints, rebuilds and remolds itself, given the new realities, Route 35 reconstruction offers an enormous opportunity to provide an upland, contiguous, linear zone of ecological significance. Bird and butterfly migrations should have been fostered by adequate or superior design.

In reality, the construction plans fall far short of the mark in several important respects.

A spread sheet evaluation of the content of the proposed plantings is attached, and gives a clear picture of the lack of focus in providing a complete design. Such a design at its heart would employ native species, from the small perennials, ornamental grasses, on through shrubs and trees of varied dimensions. Non-native plants might be an afterthought in that plan, but not its vegetative mainstay.

The types of plants selected apparently have a singular focus, summer floral display, without much regard to provide plants which give complete benefits of cover, food, nesting sites and all the attributes which native plants provide for our native and migratory fauna. Other general areas where the design appears to founder, is a diminished salt tolerance (airborne and in the soil) of some species compared to the best, an overall lack of species and cultivar diversity, use of locally invasive species, and the lack of caution in the use of species already deemed invasive elsewhere.

The following is a critique of the plantings proposed in the various species category types. Background information and suggestions for species to augment or substitute in place of the harmful are provided to improve the ecologically underperforming species now proposed on the NJDOT Route 35 Reconstruction plans.

### **Large and Medium Scale Deciduous Trees** **Subjective Evaluation Grade = Zero**

One of the ways which increase the ecological viability and continuity is the creation of continuous areas of tree canopy. Critically, there is a total lack of large- and medium-scale trees in the entirety of the project. Developing areas of continuous tree canopy in design is a goal that was not achieved, and could not be achieved in any location, given that no large trees are used. This most basic feature of roadside landscape design has been neglected

Anecdotally, large-scale trees tend to stay smaller in this environment, developing a salt-spray horizon profile altering the typical habits of any given species. Nevertheless, I have personally observed trees in the many remote places of the northern natural area of Island Beach State Park, which, directly adjacent to the project site, serves as our best guide for optimal speciation in the project. In that area, there are many large-trunked, Southern Red (Quercus falcata), Black Oak (Quercus velutina), Willow Oak (Q. phellos), other Oak species and their natural hybrids. We also see medium sized shade trees such as Black Gum (Nyssa sylvatica) and Persimmon (Diospyros virginiana) here. Hawthorns (Crataegus spp.) could also have been included in places. All would be good design choices in locations where appropriate.

Other species not native to Ocean County, but native to slightly more southern localities, such as Bald Cypress (Taxodium distichum) and Southern Magnolia (Magnolia grandiflora) would also have been worthy of inclusion on the plans.

### **Small Deciduous Trees**

#### **Subjective Evaluation Grade = F**

In the species type which will have the largest biomass of the plantings provided, the species chosen have little value ecologically. No true native of the barrier island was chosen; all are native to elsewhere. The vast majority are native to other continents.

Wise choices would have included the Shadblow Serviceberry (*Amelanchier canadensis*) and some Persimmon (*Diospyros virginiana*) as well. As suggested above, the Hawthorns (*Crataegus* spp.) are a diverse native group, some having good salt tolerance, some cultivars being thornless as well. These species are all useful in providing multi-season appeal.

The plan displays a gross over-reliance on a few cultivars of the Crape-Myrtle (*Lagerstroemia* spp.), which is native to Asia, While the Saltcedar (*Tamarix ramosissima*) is known to be a highly invasive non-native tree in the western part of the United States, it is not yet a serious pest tree here. The Amur Maple is a known invasive in the east and its use is seriously questioned.

Use of Kwanzan Cherry (*Prunus serrulata* 'Kwanzan') along Route 35 is a bit myth and a bit of tradition. In some areas where they were planted decades ago, residents held to a belief that the existence of the trees would stave off rumored plans of highway widening. Of those trees, some died; the rest languished and remained small, stressed by the harshness of the local microclimate, and were never an ideal tree for local use. To continue to hold to an idea that was originally an error is folly.

The two species that are US natives on the plans' planting lists are used in numbers that are comparatively insignificant. Neither is native to the vicinity, and neither is considered to be highly salt tolerant.

### **Evergreen Trees**

#### **Subjective Evaluation Grade = C**

The plans are considerably better in this category, as two of the three species proposed for use in the project are native to Ocean County. The Japanese Black Pine (*Pinus thunbergiana*) obviously is not.

Though Virginia Pine (*Pinus virginiana*) is proposed, one of our other Pine Barrens natives, Pitch Pine (*Pinus rigida*) is seen more frequently at Island Beach State Park's northern natural area. Sweetbay Magnolia (*Magnolia virginiana*) seen in the plans, is a highly ornamental and useful native and its use is commended and should be used in profusion.

Missing completely from the plan are the two evergreen tree species most frequently seen throughout the barrier island: American Holly (*Ilex opaca*) and Eastern Redcedar (*Juniperus virginiana*). Their absence from the design is significant. Atlantic Whitecedar (*Chamaecyparis thyoides*) is also a useful barrier area native, when available.

Southern Magnolia (*Magnolia grandiflora*) noted earlier, is a very ornamental flowering broadleaf evergreen native to extreme southern New Jersey, in wide-growing straight-species form, or narrower cultivars such as 'Kay Parris.'

### **Deciduous Shrubs**

#### **Subjective Evaluation Grade = D-**

The factors contributing to the dismal evaluation of this category of species type is a repeat of the same problems in the above categories: overuse of the non-native species, use of Rose-of-Sharon a locally weedy invasive shrub, underutilization good natives such as Bayberry (one individual shrub at one location was proposed in the 12.5 miles of the project,) and an overall lack of diversity.

An additional, a less than optimal choice was made in the Sparkleberry Winterberry Holly (*Ilex verticillata* [sic].) As footnoted in the accompanying spreadsheet, this variety is a hybrid between the barrier island's native, and an Asiatic variety. There are many fully native, vigorous, beautiful cultivars commercially available, ranging from large to compact dense varieties like *I. verticillata* 'Red Sprite.' It is wise to plant a few male plants along with the berried, showier female. The plans erroneously called for only the female 'Sparkleberry' cultivar.

Shrubby varieties of Serviceberry (*Amelanchier* spp.,) Black and Red Chokeberry (*Aronia arbutifolia* and *A. melanocarpa*) were neglected in the plans as well as Highbush Blueberry (*Vaccinium corymbosum*.) All grow vigorously in water regimes ranging from dry to moist in various locations on the barrier island. Each would be a very beneficial choice in the appropriate location. Unfortunately they were bypassed in the design for more "commodity" type plants.

### **Perennials**

#### **Subjective Evaluation Grade = D**

Only the relatively heavy use of Pennsylvania Sedge (*Carex pennsylvanica*) kept the grade from outright failure. The reasons for the unacceptability of the choices in this category follow the general reasons in categories discussed earlier.

The use of Phlox is generally commendable; though the use of single cultivars of these species in vast number is not recommended. Should a plant disease befall even one individual plant, the likelihood of a mass die-off is much greater, as opposed to use of several varieties. Each different variety may serve as a "firebreak" to the movement of pathogens infection and insect infestation.

Another reason for the poor grade is the failure to utilize a plant such as Coastal Panicgrass (*Panicum amarum*) in the design, despite the fact that it appears as an “if and where” species. A highly ornamental cultivar ‘Dewey Blue’ is widely available. Little Bluestem Grass (*Schizachryium scoparium*) is also grossly underutilized in the design. Commonly found improved varieties such as “The Blues” and “Standing Ovation” would be an environmental and aesthetic asset.

Marsh Mallow (*Hibiscus moscheutos*) is another perennial plant with great benefits and is exceptionally ornamental. Only three plants, improperly categorized as shrubs on the plans, were used in the 12.5 mile project.

Many great native perennials support the butterfly migrations, in particular, the Milkweeds (*Asclepias* spp.) These are highly showy and typically flower in summer in shades ranging from reds, pinks, orange and white. *A. incarnata*, *A. rubra*, *A. tuberosa* are all commercially available and are locally native. For reasons unknown, none of these truly important plants are in the design plans.

There are other native perennials not listed here, which would have been worthy of consideration. Also, a woody plant which is a native evergreen groundcover, Bearberry (*Arctostaphylos uva-ursi*) is one which might have been considered in place of the 12,000+ potentially invasive Lilyturf (*Liriope muscari*) plants found in the design. Another evergreen woody groundcover, Maryland Dwarf Holly (*Ilex opaca* ‘Maryland Dwarf’) is also a fitting substitute to some of the plants used in the design.

### **Evergreen Shrubs**

#### **Subjective Evaluation Grade = A-**

The design, commendably, has 100% local native species content in this category. The only criticism is the lack of diversity in choice. Though limited, there are a few other local species and cultivars which might have added depth or sustainability to the design. Some Sweetbay Magnolia (*Magnolia virginiana*) cultivars and selections of Atlantic Whitecedar (*Chamaecyparis thyoides*) grow in predictable shrubby forms, as well.

### **Summary**

Native trees and other native plants are significant in the creation of habitat. They are the basis of the life cycles of the migratory birds. Bird and butterfly migrations are significant events in the natural pulse of the barrier island, and are easily seen by even the casual observer. They are events fueling the growing movement towards eco-tourism locally.

While there are many reasons why design choices evolve – visual appeal, horticultural suitability, availability of plant material, and others, it would seem that local ecological

significance was not seriously considered as a factor in deciduous trees, and to a somewhat lesser degree, plantings in general. It seems that the splash of summer color that would be provided by most of the species was the overarching force behind this design.

What is the point in the state drafting and enforcing a CAFRA law, and providing regulations regarding species use for private development in this locality, if the Department of Transportation isn't following that same NJDEP guidance for the primary use of ecologically significant native plant species? And in its truly significant scale, the size of this particular project makes this an even greater loss compared to smaller sites which fail in some way, to live up to the code and goals promulgated by CAFRA.

Though not every non-native plant has direct, dire environmental consequences, the use of large numbers of plants not native to this barrier island diminishes nature's ability to heal itself with its own local tools, native plant species.

One need only look a mile south of milepost 0.0 of the project site to invading areas of Asiatic Sand Sedge (*Carex kobomugi*.) It was planted in the 1970's by the state at the governor's residence in Island Beach State Park. At the time there were high hopes for "dune stabilization" using this vigorously spreading perennial because of its salt-resistance and ability to stabilize dunes. Today the species is a very serious local invader, displacing American Beachgrass (*Ammophila breviligulata*) and is overtaking formerly pristine natural areas miles from the site, where a design plan once haphazardly introduced this plant species. Control of it has proved impossible to date. The degradation of the environment is staggering. The eventual extent of the environmental damage caused by this foolish planting is, as yet, unknown.

As a local resident and professional for well over a quarter century, I believe that before the planting begins, that reconsideration of the species and varieties of plants chose for the Route 35 Restoration Project be made. Some of the proposed plantings are so flawed that they may become the next environmental boondoggle, like the Asiatic Sand Sedge.

I welcome input and dialogue from Save Barnegat Bay and the NJDOT in regard to this matter, in hopes that we can improve the design, and benefit both the human and natural community.

Very truly yours,



Bryce Bennett

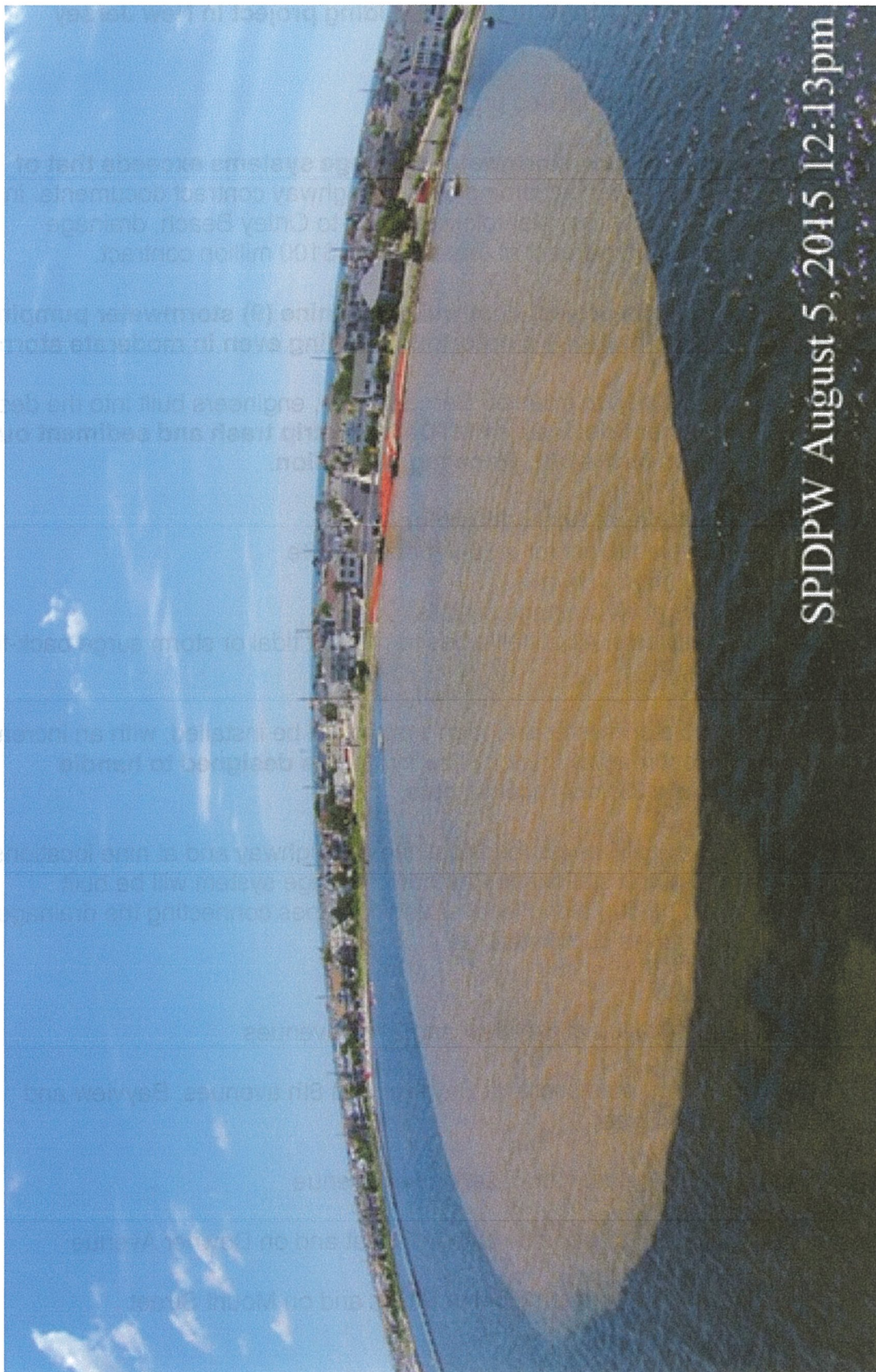
Licensed Landscape Architect

## Expanded List of Salt-Tolerant Recommended Native Species

Botanical Name	Common Name	Higher Salt Tolerance
<b>Large- and Medium-Sized Trees</b>		
<i>Celtis occidentalis</i>	Common Hackberry	✓
<i>Diospyros virginiana</i>	Common Persimmon	✓
<i>Nyssa sylvatica</i>	Black Gum	✓
<i>Quercus alba</i>	White oak	
<i>Quercus bicolor</i>	Swamp White Oak	
<i>Quercus coccinea</i>	Scarlet Oak	
<i>Quercus falcata</i>	Southern Red Oak	✓
<i>Quercus phellos</i>	Willow Oak	
<i>Quercus prinus</i>	Chestnut Oak	
<i>Quercus velutina</i>	Black Oak	
<i>Taxodium distichum</i>	Bald Cypress*	✓
<b>Small-Sized Trees</b>		
<i>Amelanchier arborea</i>	Juneberry	✓
<i>Amelanchier canadensis</i>	Shadblow Serviceberry	✓
<i>Crataegus crus-galli</i> 'Inermis'	Thornless Cockspur Hawthorn	✓
<i>Crataegus</i> spp.	Hawthorn (Various species)	
<i>Diospyros virginiana</i>	Common Persimmon	✓
<i>Sassafras albidum</i>	Sassafras	
<i>Magnolia virginiana</i>	Sweetbay Magnolia	
<b>Evergreen Trees</b>		
<i>Chamaecyparis thyoides</i>	Atlantic Whitecedar	✓
<i>Ilex opaca</i>	American Holly	✓
<i>Juniperus virginiana</i>	Eastern Redcedar	✓
<i>Magnolia grandiflora</i>	Southern Magnolia*	
<i>Pinus rigida</i>	Pitch Pine	
<i>Pinus virginiana</i>	Virginia Pine	
<b>Deciduous Shrubs</b>		
<i>Amelanchier canadensis</i>	Serviceberry (Shrub-form)	✓
<i>Aronia arbutifolia</i>	Red Chokeberry	
<i>Aronia melanocarpa</i>	Black Chokeberry	✓
<i>Baccharis halimifolia</i>	Groundsel Bush	✓
<i>Callicarpa americana</i>	American Beautyberry*	✓
<i>Clethra alnifolia</i>	Sweet Pepperbush	
<i>Gaylussacia baccata</i>	Black Huckleberry	
<i>Ilex verticillata</i>	Winterberry Holly	✓
<i>Iva frutescens</i>	Salt-Marsh Elder	✓



Lindera benzoin	Spicebush	
Morella (Myrica) pensylvanica	Northern Bayberry	✓
Prunus maritima	Beach Plum	✓
Rhus copallina	Winged or Dwarf Sumac	✓
Vaccinium pallidum	Lowbush Blueberry	
Vaccinium corymbosum	Highbush Blueberry	
Viburnum dentatum	Arrowwood Viburnum	
<b>Evergreen Shrubs</b>		
Arctostaphylos uva-ursi	Bearberry (Low Groundcover)	✓
Chamaecyparis thyoides 'Heatherbun'	Heatherbun Falsecypress	
Chamaecyparis thyoides vars.	Atlantic Whitecedar varieties	✓
Ilex glabra	Inkberry Holly	
Ilex opaca 'Maryland Dwarf'	Maryland Dwarf American Holly	✓
Magnolia virginiana 'Sweet Thing'	Sweet Thing Sweetbay Magnolia	
<b>Herbaceous Perennials, Grasses and Ferns</b>		
Achillea millefolium	Yarrow	✓
Asclepias incarnata	Swamp Milkweed	✓
Asclepias rubra	Red Milkweed	
Asclepias syriacus	Pink Milkweed	
Asclepias tuberosa	Butterfly Milkweed	✓
Hibiscus moscheutos	Marsh Mallow	✓
Opuntia humifusa	Eastern Prickly-Pear	
Phlox paniculata*	Fall Phlox	
Phlox subulata*	Moss Phlox	
Smilacina racemosa	False Solomon's Seal	✓
Solidago sempervirens	Seaside Goldenrod	✓
Symphotrichum nova-belgii	New York Aster	
Ammophila breviligulata	American Beachgrass	✓
Carex pensylvanica	Pennsylvania sedge	
Juncus gerardii	Blackgrass	
Panicum amarum	Coastal Panicgrass	✓
Panicum virgatum	Switchgrass	
Schizachryium scoparium	Little Bluestem Grass	✓
Spartina patens	Salt Marsh Cordgrass (Salt Hay)	✓
Osmunda cinnamomea	Cinnamon Fern	
Osmunda regalis	Royal Fern	
<b>*Exceptional Ornamental Plant Native to nearby to elsewhere in NJ or in eastern US.</b>		
General Note: While the species listed are generally hardy to site conditions, plants should be purchased from local nurseries which use local genotypes, to better ensure hardiness.		



SPDPW August 5, 2015 12:13pm





### Single biggest post-Sandy infrastructure rebuilding project in New Jersey

**\$16 million** - Cost per mile

**\$200 million** - Total cost for completed project

**In some areas, the cost of new stormwater drainage systems exceeds that of laying down the new roadway**, according to state highway contract documents. In the biggest section of the project, from Mantoloking south to Ortley Beach, drainage systems account for some 20 percent of that portion's \$100 million contract.

**Just over \$31 million of the project cost will go for nine (9) stormwater pumping stations, to deal with the highway's notorious flooding even in moderate storms.**

To help reduce runoff pollution to troubled Barnegat Bay, engineers built into the design: **76 manufactured treatment devices, or MTDs, that strip trash and sediment out of the water before it flows to the bay. Price tag: \$6 million.**

#### **Improvements to be made on Route 35 include:**

- full-depth pavement replacement for a 50-year design life
- corridor-wide drainage improvements
- water quality chambers at all drainage outfalls
- installation of check valves at all outfall pipes to prevent tidal or storm surge back-flow into the drainage system.

An all-new underground stormwater drainage system will be installed, with an increased number of inlets to collect roadway runoff. **The system is designed to handle drainage needs of Route 35, not local streets.**

According to NJDOT, work will be performed along the highway and at nine locations close to the bay, where pump stations for the new drainage system will be built. Temporary trenches will be dug along local streets for pipes connecting the drainage system along Route 35 to the pump stations.

#### **Pump locations:**

- **Berkeley** — one pump station at Bayview and 22nd avenues
- **Seaside Park** — three pump stations at Bayview and 8th avenues, Bayview and Island avenues, and on L Street
- **Toms River** — one pump station on Eisenhower Avenue
- **Mantoloking** — two pump stations on Lyman Street and on Downer Avenue
- **Bay Head** — two pump stations on Goetze Street and on Mount Street

**NJDOT's Route 35 storm water drainage  
Is a problem that must be addressed**

by William deCamp Jr.

For almost two years, amid cheerful promises of enhanced environmental protection, the New Jersey Department of Transportation (NJDOT) has constructed an expensive and elaborate drainage system as part of their reconstruction of Route 35 between Bay Head and South Seaside Park in Ocean County.

That system has spectacularly failed, and the consequences for the public and the environment are great.

Nine pump stations intended to deliver storm water from Route 35 into Barnegat Bay now line the barrier island. The efficacy of this system is premised on the idea that its pipes would be water tight against infiltration from groundwater. They are not.

The result is that twenty-four hours a day massive amounts of groundwater of unknown chemistry are being pumped from under the barrier island and into Barnegat Bay. That groundwater might contain anything from raw sewage, to chemical spills, to the naturally occurring nitrogen or phosphorus that Barnegat Bay already contains in excess.

The designed intent of the system had been that these pumps should not be running at all except in a five-year storm or greater.

The most visually dramatic of these failed facilities is along Route 35 on the bay front north of the bridge at Seaside Heights. A virtual Niagara of groundwater is being pumped into Barnegat Bay non-stop.

Farther south, the discharge station at L Street in Seaside Park may be taken as indicative of many of the system's overall problems:

- The dark appearance of the effluent suggests that raw sewage may be intermixed with the groundwater being pumped into Barnegat Bay.
- The pump, which is noisy, runs frequently even in the absence of rain.
- A driveway in the neighborhood has cracked, possibly because of land subsidence, as has the foundation of one home. A groundwater well has gone dry.
- Public access to the bay has been partially blocked and its quality diminished.
- According to the neighbors, wildlife has decreased in the area.

Each of the nine pump stations has its complement of problems whether it be at Mount Street in Bay Head, where the Scow Ditch is being silted in; or at Goetze Street in Bay Head, which gets flooded instead of drained; or at North Bayview Avenue in Seaside Park, where some of the pipes are partially plugged by sand at the bay front.

In every case these facilities introduce a sulfurous stench, which is presumably that of hydrogen sulfide, a poisonous gas associated with sewers, into the neighborhood.

Numerous actions by government are urgently needed in response to this debacle:

- Although the likelihood of danger is small, the air near these outlets needs to be tested on a day when there is no wind so that it may be confirmed that the neighbors' health is not in jeopardy.
- The chemical contents of the water entering Barnegat Bay need to be assessed. How many unwanted pounds of nitrogen and

phosphorus are these pumps delivering into Barnegat Bay each day? And how much raw sewage or heavy metals?

- A quantitative assessment into whether land subsidence is resulting from these non-stop removals of groundwater from under the barrier island is needed. Is the NJDOT sinking our island?
- The infiltration of ground and sewer water needs to be stopped either by lining, coating, or replacing these brand new leaky pipes.
- The current construction of a similar storm water drainage system on Route 72 onto Long Beach Island should be suspended until the NJDOT learns how to design and implement the system competently.

Perhaps the most discouraging aspect of this situation is as an example of broken government. One scans the horizon in vain in search of any state official willing to be held accountable.

The NJDOT, as well the New Jersey Department of Environmental Protection, which did the permitting for this debacle, would do well to use this manmade disaster as an opportunity to reflect on their respective institutional cultures. They should be serving the public interest, not diminishing it.

The contractors for these drainage systems might also stop to consider whether they are making an ethical living.

Simple solutions to these problems are not immediately apparent, but an open acknowledgment of their degree and scope will be a start.

*William deCamp Jr. is president of Save Barnegat Bay.*