

# Public Hearing

before

## STATE BEACH EROSION COMMISSION

"The status of Federal shore protection projects, Federal disaster relief projects related to the December 1992 storm, and discussion of shore protection and disaster aid eligibility requirements for municipalities"

**LOCATION:** Municipal Hall  
Ocean City, New Jersey

**DATE:** September 15, 1993  
10:00 a.m.

### MEMBERS OF THE COMMISSION PRESENT:

Assemblyman David W. Wolfe, Chairman  
Assemblyman John C. Gibson, Vice Chairman  
Senator William L. Gormley

### ALSO PRESENT:

Senator James S. Cafiero  
Assemblyman John F. Gaffney  
Assemblyman Fredrick P. Nickles

George J. LeBlanc  
Office of Legislative Services  
Aide, State Beach Erosion Commission



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**Senate Members:**  
John O. Bennett  
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William L. Gormley  
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**Assembly Members:**  
Steve Corodemus  
John C. Gibson  
Robert G. Smith  
David W. Wolfe

**Public Members:**



## State of New Jersey

State Beach Erosion Commission  
Legislative Office Building, CN-068  
Trenton, New Jersey 08625-0068  
(609)-292-7676

### NOTICE OF PUBLIC HEARING

The State Beach Erosion Commission will hold a public hearing on the status of federal shore protection projects, including a report on the federal disaster relief efforts related to December, 1992 storm. The Commission will also conduct a roundtable discussion on shore protection and disaster aid eligibility requirements for municipalities.

Federal officials from the Federal Emergency Management Administration (FEMA) and the United States Army Corps of Engineers have been invited to provide testimony and assist in the roundtable discussion.

The hearing will be held on **Wednesday, September 15, 1993 at 10:00 AM** at the **Ocean City Municipal Hall, Ocean City.**

*The public may address comments and questions to George LeBlanc, Aide to the commission, at (609) 292-7676. Anyone wishing to testify should contact Carol Hendryx, secretary, at (609) 292-7676. Those persons presenting written testimony should provide 15 copies to the commission on the day of the hearing.*

#### Directions to Ocean City Municipal Hall:

##### Garden State Parkway South

Take Exit 30 (Somers Point, Ocean City). After toll, proceed to stop sign. Continue straight through stop sign approximately 1 mile to circle. Go halfway around circle to bridge into Ocean City (1.9 miles). In Ocean City, Municipal Hall is at corner of 9th Street and Asbury Avenue (3rd traffic light). Enter Municipal Hall on ground level entrance on 9th Street. Take elevator to 3rd floor, Council Chambers on left.

##### Atlantic City Expressway

Take Exit 7S to the Garden State Parkway (South). Follow directions for Garden State Parkway South (above).

Issued 9/9/93

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**ASSEMBLYMAN DAVID W. WOLFE (Chairman):** My name is Assemblyman Dave Wolfe, from Ocean/Monmouth County, and I'd like to call the third meeting of the State Beach Erosion Commission to order.

This particular Commission, designated by the Legislature, is comprised of eight legislators and four public members, the purpose being to assess the status of the 172 miles of coastline in the State of New Jersey. Our first meeting was an organizational meeting. The second meeting that we held was primarily an update from the State and also from the Corps of Engineers on several ongoing projects that were in progress at the moment.

Today's meeting will focus on-- The purpose of the meeting is to talk about-- Officials from FEMA will discuss with us some of their projects, but primarily the Commission today is interested in the criteria for an engineered beach. That will be one of the focuses for our meeting today, and then we will open up for public discussion.

When some of you came in, there were two different pieces of paper floating around. One was a yellow piece of paper which some of you signed. In the meantime, a white tablet has been placed on the front of this table. If you wish to speak either now or perhaps during the testimony a little bit later on, simply just fill out one of these forms and put it up here with us. We'll try to take you people in the order that you indicated that you would like to speak.

Everyone will get a chance to speak today. This is very informal. We basically follow Robert's Rules, and we will not really interrupt the speakers while they are speaking.

I'd like to introduce the people who are here today. I'd like them to introduce themselves. We'll start at the end with the Senator.

**SENATOR CAFIERO:** Senator Cafiero, District 1.

SENATOR GORMLEY: Senator Gormley, District 2.

MR. LeBLANC: (Committee Aide) George LeBlanc, Office of Legislative Services.

ASSEMBLYMAN GIBSON: I'm Assemblyman Gibson, from District 1.

ASSEMBLYMAN NICKLES: Fred Nickles, District 2.

ASSEMBLYMAN WOLFE: I might add that Assemblyman Gibson really will be Chairing the meeting today because I will have to leave for a few hours. Hopefully we'll be out of here within a few hours, but he will be taking over.

So at this time, we would like to begin by calling on representatives of FEMA to speak before us, and whoever wishes to speak from them first may come forward. Simply state your name and your position, and make your presentation.

J O S E P H G A L I N I S: I'm Joe Galinis. I'm the Public Assistance Officer for the current northeaster disaster here in New Jersey. It was designated back in December of '92.

ASSEMBLYMAN WOLFE: Excuse me. May I interrupt you for a minute?

Are you from Assemblyman Smith's office?

UNIDENTIFIED SPEAKER FROM AUDIENCE: Yes.

ASSEMBLYMAN WOLFE: Would you like to come up and sit up here? (addressing Assemblyman Smith's representative)

Sir, would you like to have a seat there. You can speak right into the microphone. (addressing the witness)

MR. GALINIS: As I said, I'm the Public Assistance Officer currently for the disaster that is still ongoing in a field office out of Brick, New Jersey. My understanding is I'm here to discuss the criteria for beach erosion as it applies to the FEMA rules and regulations.

I have handouts which basically will provide technical details to meet the FEMA eligibility. Those should be provided to your engineers. FEMA is not in the business of designing the beach. We will review it at the time of an incident.

There are two types of categories that basically FEMA can provide Federal assistance after a presidential declaration. Category "B" is the emergency protective measures for which just about every beach on the Jersey shore has received some type of money or funding through New Jersey OEM.

The permanent beach restoration: Currently, there are only two towns that have been recognized by FEMA as an engineered beach in the State of New Jersey; the rest do not. They do not meet the criteria, and the criteria, as I said, is explained in detail in the handout that I have.

My understanding is you would like to know some of the funding -- the overall funding that we have provided?

ASSEMBLYMAN WOLFE: We're primarily-- That may be one of the things, but our primary concern is the criteria for designation as an engineered beach. Would you indicate the two towns in New Jersey that are designated as having engineered beaches?

MR. GALINIS: Currently the two towns are Avalon and Sea Isle City, which have received permanent restoration work for beaches. A lot of towns have received dune grass, sand fencing, and so forth like that, up and down the coast. But as far as permanent beach restoration work, those are the only two towns that received any type of funding.

There is a map that is within the handout that we have provided that will give you a snapshot of what we have provided to the DEPE of the State of New Jersey, because they are the applicant in this current disaster for all sand related issues.

ASSEMBLYMAN WOLFE: Mr. Galinis, we're looking over the criteria for the beach nourishment projects. It is a rather lengthy document.

MR. GALINIS: It is.

ASSEMBLYMAN WOLFE: It's got a lot of what look like algebraic equations in here, sines and cosines, and "X"s and "Y"s. Could you synopsise the basic criteria?

MR. GALINIS: (witness begins showing slides) All right, if I may. Basically, this is part of the handout that was in there that meets the FEMA emergency work criteria. The next slide would be for giving more of-- I'm not going to read it because it is part of your handout. Basically, any emergency work is to protect property, life, and health safety issues, and it is very limited, as you can see.

This is what constitutes permanent work. (indicating slide) These are two different categories--

SENATOR GORMLEY: Excuse me. "A," "E," "O," could you do me a favor?

ASSEMBLYMAN WOLFE: Could you go back to the first slide?

SENATOR GORMLEY: I appreciate all the slides and everything. Could you outline this in plain English for people. That's what the hearing is about, to sort of translate for the public and translate for the legislators so we can get a better sense of how we can get more people into the various categories so we can get more aid. That's the bottom line. That's what this is about. That's why some officials and mayors are here today.

So could you give us your synopsis of it in three or four minutes so we can get an outline from your point of view what it is; what are the principal criteria.

ASSEMBLYMAN WOLFE: Before you begin, I'd just like to introduce Assemblyman Gaffney, one of our hosts.

Assemblyman, thank you for coming.

ASSEMBLYMAN GAFFNEY: Thank you, Assemblyman. It's good to be here.

MR. GALINIS: Sir, basically to qualify for the permanent work on a beach, the beach must conform to the '44 Code of Federal Regulations: 206.26. I can read to you exactly what it says. As I stated--

SENATOR GORMLEY: Is that one of the regulations that Al Gore wants to get rid of?

MR. GALINIS: These are the regulations. The technical side of how to conform to that is in the handout. It's very lengthy and very detailed. The engineers for each of the towns, or in conjunction with the State should work that. FEMA does not design your beaches. We are not in that business. We go in after a presidential declaration and determine the eligibility. If you have met the eligibility criteria--

SENATOR GORMLEY: What are the principal criteria that were met by Avalon and by Sea Isle City? What were the principal things? Give me the highlights.

MR. GALINIS: They have a profile that they have designed their beach. They have maintained it to that profile, and they have-- It includes proper grain size, and it's imported from another source. They have a renourishment program. They capitalize in their budget, and they do that.

Not every year do you need to renourish your beaches, but every so often you have to look at your beach, take another profile, and bring it back to that profile.

SENATOR GORMLEY: All right. When you talk about renourishing, what are we talking? What did they do to renourish?

MR. GALINIS: They have an ongoing program for renourishment. I don't have the specifics of their program, but it must meet the criteria as stated in the '44--

SENATOR GORMLEY: Oh. Excuse me for one second.

A N D R E W A. P R E V I T I, P.E.: I have the--

SENATOR GORMLEY: Would you please.

MR. PREVITI: (individual speaks from audience; segments of comments are indiscernible) My name is Andy Previti, Municipal Engineer of Sea Isle City. Our specific renourishment is (indiscernible) and to meet the criteria, it has to be done at least within a five-year period of time. After you do your initial nourishment you have to monitor it;

you have to study how much sand you've lost; and in your report you prepare prior to renourishment, you have to estimate how much you are going to lose. At a point in time within that five-year period, you have to pump more sand (indiscernible) The purpose of that is so that you can -- your city can budget the money to do that (indiscernible)

That Sea Isle City has done. The most recent was done in 1992. The City budgeted the money on their own and nourished the beach. And because of that we qualified -- at least a section of our beach qualified.

ASSEMBLYMAN WOLFE: Could you use the microphone, please?

SENATOR GORMLEY: All right. Wait until you get up to the mike.

How much money a year do you set aside for this?

MR. PREVITI: (complies and moves to microphone) Well most of it-- There is a small amount in the budget as a line item -- a few hundred thousand dollars for it -- things like planting grass and erecting fence. But the nourishment projects are primarily capital programs, and they're done through a bond ordinance. We try to anticipate a year in advance what the needs would be for the next year, and then introduce a bond ordinance that would have the funds available to use for your nourishment projects.

SENATOR GORMLEY: What is the percentage match?

MR. PREVITI: Well, it used to be 75/25 percent. It still is, but for the past seven or eight years there haven't been funds available from the State, so Sea Isle City has opted to fund their own project. We have an agreement with the State of New Jersey, when they have funds available, they will reimburse us. But we just couldn't wait until the--

SENATOR GORMLEY: How long was that? Eight years overdue? Is it going on confederate currency right now?

MR. PREVITI: The nourishment we did in 1990 was probably a couple of years overdue, and then we had to do a little more work in 1992 after the winter storms.

SENATOR GORMLEY: So from your perspective of the local town in terms of working out-- In other words, the State assisting with FEMA, it's a matter of getting a coordinated program, possibly taking the new \$15 million we've set aside for projects or whatever, and taking a portion of it to see how many towns possibly are willing to do a match or a portion of the match in conjunction with additional State moneys to see how far we can stretch the dollars?

MR. PREVITI: Yes. We have more of an engineered beach than what qualifies as an engineered beach. The section of our beach that qualifies under the FEMA regulation is from 74th to 90th streets.

SENATOR GORMLEY: What's an engineered beach?

MR. PREVITI: Well, it's something that an engineer designed, to put it as simply as possible.

SENATOR GORMLEY: Okay, fine. Not just any--

MR. PREVITI: But that's my definition of it, or an engineer's definition of it. FEMA's definition is that it has to be maintained every five years, and there has--

SENATOR GORMLEY: It has to be replenished every five years?

MR. PREVITI: Yes. It has to be maintained or replenished at least once in a five-year period. That's been the big stumbling block. We have an engineered beach from 47th Street down to 90th Street in Sea Isle City. However, the stretch from 47th to 74th has not been maintained in over 10 years. Mostly it has not been necessary to maintain it, but in other sections it is necessary, but the City just does not have the funds. The area that they maintained recently was the hardest hit in the winter storms. They put their money where it was needed most. Another area was left to do, possibly next year, using its own funds again.

SENATOR GORMLEY: So what FEMA is saying is that if there is a match -- a match and an engineered beach, they'll follow after a match. They're looking for some matching funds in the process.

MR. GALINIS: You've got to meet the criteria of setting up a profile and maintaining to that profile. Beach renourishment is part of that, at least once every five years going back in and bringing it back to that profile that you have set.

MR. PREVITI: That's the main stumbling block that we have had.

SENATOR GORMLEY: Now let's go to-- The problem for the municipalities, therefore, is the cost of replenishment or renourishment, or whatever you want to call it. It is a capital cost beyond a beach community's budget capacity.

MR. PREVITI: Exactly. In my opinion, exactly.

SENATOR GORMLEY: Good. Profiles, criteria-- Stay there for a second. (directing witness to remain at table) We might actually understand all this.

So, from your perspective, and I know we're going to get more testimony-- We're seeing a lot of local officials today. The point is, how do we work out the mix to stretch the dollars further, and how do we provide for that municipality those capital funds? Do we even do a different mix? So far we've thrown all the burden back on you. Do we say to some municipalities, "Listen, can you--" There seems to be no negotiations here. In other words, "Listen, you can only do this in your budget." Suppose we come up with, "You do 11.5 percent, and we'll do 13 percent," or whatever, to come up with the amount of money necessary to do their level of replenishment to get the State money. Is that what we should be striving for? It would appear to be the case.

MR. PREVITI: Yes, but municipalities such as Sea Isle City cannot indefinitely fund their own projects as they have

done for the last two years, and Avalon has done the same thing. There reaches a point where your bonding capacity starts diminishing, and you just can't afford to do it.

SENATOR GORMLEY: What percentage of your bond capacity has been used up by replenishment?

MR. PREVITI: I don't know that offhand. Sea Isle City's financial condition is very good. They have been fortunate and able to retire some bonds before they matured, and they're in pretty good condition. But going forward in the next five or ten years, my own opinion is I don't think that they can afford to do these projects on top of every other capital project that they are responsible for: water, sewer, roads, and everything else.

SENATOR GORMLEY: Good.

ASSEMBLYMAN NICKLES: Mr. Chairman?

ASSEMBLYMAN WOLFE: Yes.

ASSEMBLYMAN NICKLES: I would assume that one of our purposes today is--

UNIDENTIFIED SPEAKER: May I sit down now? (laughter)

ASSEMBLYMAN WOLFE: Sure, but we know where you are.

SENATOR GORMLEY: Give him a portable mike.

ASSEMBLYMAN NICKLES: I would assume that one of our purposes is to determine how to spend or appropriate the \$15 million which the Legislature created. Is that correct?

ASSEMBLYMAN WOLFE: No. That is not the purpose of today's hearing. We discussed last hearing where the \$15 million is currently going. I was going to add that the Committee was quite dismayed to learn at our second meeting that it was the intent of the State to use that moneys to match the moneys that were already going to ongoing Corps of Engineer projects. It was the Committee's belief that that money was designated for emergencies and for projects of an emergent nature, not on an ongoing nature that had already been committed over the previous years. So that's something with which we will be dealing in the future.

However, today -- just getting back to what both the Senator and Assemblyman were saying -- Mr. Galinis has indicated to us that only two communities in the State of New Jersey qualify for this particular section of the Federal moneys. Our concern as legislators is why, number one, not to penalize those communities who obviously did what they were supposed to do, but how were the communities in the State of New Jersey told what these criteria were four, five, or six years ago so they could do this? How was that information disseminated to the municipalities, and why was it that only two out of all the coastal communities in the State of New Jersey chose to follow through on those guidelines?

We're not here to castigate those two communities. Obviously, they did what they did. But our concern as legislators is, when we were faced with a crisis, we went to the State. The State basically did what they could do, and they were prohibited from going further because the other municipalities had not done what Federal regulations were.

So I think one of the things we have to get to the bottom of today is, how was that information disseminated to the communities, and why only two out of all the coastal communities were prepared?

Mr. Galinis, you're obviously a Public Assistance Officer; you're not an engineer?

MR. GALINIS: No.

ASSEMBLYMAN WOLFE: And you're giving us information. Could you tell the Committee, if you could, when these criteria were designated by FEMA, how many years ago?

MR. GALINIS: In 1984 was the first occurrence, to my knowledge, when the beach issue arose in the State of New Jersey. At that time, the FEMA had provided to the State -- I believe it was OEM at that time -- what is the criteria to become eligible in the future for permanent beach restoration.

ASSEMBLYMAN WOLFE: So you're saying these criteria have been in existence for almost nine years?

MR. GALINIS: Nine years.

ASSEMBLYMAN WOLFE: Right. And whose-- I shouldn't be asking you, but we have to find out. Whose responsibility was it or is it to so notify the municipalities of the State of what they must do? Do you know?

MR. GALINIS: Not offhand, sir.

ASSEMBLYMAN WOLFE: So your job is simply to notify the State?

MR. GALINIS: At the time of the disaster, we interface with whoever is responsible at the State level -- at this time it's OEM -- and the municipalities who are within the declared area. We go over the eligibility not only for beaches, but for all other categories of work. At that time it was done. They chose not to at their own discretion. We cannot force them to do something.

ASSEMBLYMAN WOLFE: Okay. So we're not here to-- Time has gone by, so what we're concerned about today is, what can we do now to do what needs to be done?

MR. GALINIS: My own opinion, sir, is to work closely with your State OEM people who know the FEMA rules and regulations, and with your DEPE.

ASSEMBLYMAN WOLFE: Okay.

Assemblyman?

ASSEMBLYMAN GAFFNEY: I was going to mention the gentleman there had his hand up. But I think you're right, Assemblyman. So often at these types of hearings, it appears that we're trying to fix the blame instead of fixing the problem. I would rather see us come out of here with something constructive today in fixing the problem.

A quick question, though, on a related matter: In this-- Where you declare as an engineered beach, the beach has to be engineered and brought every five years-- Do you ever--

Does FEMA give any consideration to the fact that there is a thing called Mother Nature out there; that Ocean City's Beach could be at Cape May Point next year, and so forth through Mother Nature; and that's never going to stop? How does that plug into this criteria that you're mandating on municipalities?

In other words, they could do the best job -- Sea Isle could do the best job they could ever do, spend a lot of money, and I'll guarantee you their beach could be down in Cape May Point next year through no fault of their own.

MR. GALINIS: Again, sir, to state the rules that I'm governed to enforce, they've got to meet the criteria of having an engineered beach, which is fairly simple. But to capitalize money and to do something -- spend money -- to renourish the beach if it's needed after an event, whether it's presidentially declared or not, is up to that community. It is not FEMA.

ASSEMBLYMAN GIBSON: Mr. Chairman?

ASSEMBLYMAN GAFFNEY: Have we fixed the problem?

UNIDENTIFIED SPEAKER FROM AUDIENCE: Mr. Chairman? Questions, please?

ASSEMBLYMAN WOLFE: We have to follow Robert's Rules of Order. If you have any questions, you'll have to come up and fill out one of these forms to speak, otherwise we'll be here a long time.

Go ahead.

MR. GALINIS: Sir, FEMA does not dictate to the states, let alone the communities, how to spend their money. That is their choice. At the time of a presidential declaration, we come in and if you tell us that you have beach erosion, we're going to ask a series of questions: basically, what is your profile, what have you done over the last five years or so to maintain that profile, what have you done. The towns provide the documentation, and if it meets the criteria,

they're eligible. Two cities have chosen that path. The others, for whatever reason of which I am not familiar -- it's not in my province to really comment or not.

SENATOR GORMLEY: Let us assume from 1984 on that I would assume most municipalities interested in beach replenishment would have looked at the regulations. Isn't the bottom line the 25 percent match for the towns that wanted to do it?

MR. PREVITI: It's 100 percent. In order to meet FEMA's regulations, it's 100 percent. It's not just engineering the beach, it's building the beach.

SENATOR GORMLEY: It's building a beach to get their match--

MR. PREVITI: In our case, \$25 million to build a beach. You can't be eligible until you build a beach.

ASSEMBLYMAN NICKLES: And you have to put all the capital up front first in order to be eligible?

MR. PREVITI: Yes, then you're eligible.

ASSEMBLYMAN WOLFE: Time out. Do you want to stand and give your name, who you are, and from whence you speak.

ASSEMBLYMAN GAFFNEY: He was fine. It was my fault. I'm sorry.

**R I C H A R D D E A N E Y:** I was answering the question. My name is Rich Deaney. I'm the City Administrator of Ocean City.

I think I can shed some light on this, especially in light of Senator Gormley's questions. If you want to get to the heart of it, it's money. We do know how to engineer the beach. Mr. Previti engineered the beach down in Sea Isle. He's our engineer. He can engineer a beach here in Ocean City. The fact is, we have eight miles of beach. It cost \$25 million to replenish part of the beach this year. We were fortunate enough to be eligible, not under FEMA, but under the Army Corps of Engineers and the DEPE. So we did get a lot of

beach replenished -- five million yards of sand, the largest project on the East Coast -- not because of FEMA, but because of the Army Corps of Engineers.

A third of our island was not eligible under the Army Corps of Engineers. It would be eligible under FEMA. We are attempting to get a portion of that engineered. The reason we are is because we have that replenished already now. It's very easy to get that engineered. We already have the sand 10 feet high, 100 feet, 30-to-1 slope -- \$25 million worth of sand.

SENATOR GORMLEY: You already have the capital expended?

MR. DEANEY: Exactly. But these other towns can't, and on a third of our island, we can't either. It would cost us of our own money another \$2.5 million to do another 12 blocks from 36th Street to 60th Street that need doing. The water comes up to the bulkheads in that area. We would love to have it engineered. We can design it. We've already done the topographical studies. It cost us \$20,000 or \$30,000 to do that. We can't afford the \$2.5 million on top of that, 100 percent.

The reason why we can't is because we're going to lose some of that over the next five years. So after we spend the \$2.5 million of our own money, we're going to have to again spend another \$2.5 million of our own money unless we have a storm to the degree that we had the storm in December, in which the President declares the emergency, then FEMA comes in on a cost match and helps you.

SENATOR GORMLEY: What was the match? What is the match ratio?

MR. GALINIS: The minimum Federal share is 75 percent of eligible costs.

MR. DEANEY: We have a recommendation, Senator Gormley. We think we need a large partnership here, beyond

what we already have. We have \$15 million of State money that ought to be used as part of this partnership somehow. A lot of different ideas.

The Federal government, through FEMA, consistent with its own goal of repetitive loss reduction, should fund initial beach renourishment in the geographic areas not otherwise assumed by the Army Corps of Engineers. When the Army Corps has assumed certain areas because of the economic viability of those portions of the community-- They make their own judgments through their own complicated formulas, and they're doing a big project up in Monmouth County now that is 20 miles long -- Sandy Hook down to Asbury Park. They did Ocean City. They did Cape May.

That's one section of beaches. But there are a lot of beaches and areas where they don't have jurisdiction and don't want to take jurisdiction. We suggest that the FEMA take jurisdiction in those areas, and where needed, do an initial beach replenishment funding under a cost share. The Federal government is going to have to get more involved, not just come in here at that point.

Secondly, the municipal government should be responsible for obtaining all the necessary property easements, and to topographically survey and monitor beach profiles on a regular basis at regular time intervals to maintain dunes, dune fencing, and dune plantings.

We think we have a role, and part of that role is to quarterly, or every half year go out and topographically survey -- that's expensive, but it's within the realms of all of our municipal governments to do -- to see how the beach has changed over the seasons -- we know it changes -- to see how it's changed.

We think that we should also be responsible for obtaining all the easements so that the public has access to the beach up and down the State, from one end to the other. If

we're going to use public funds, we should acquire that at our expense -- or the property at our expense, whatever it takes to get access to the beaches.

Thirdly, that the State and the county governments-- Here's an area where the county governments, frankly, don't do their share. Two out of the four coastal counties participate; two out of the four coastal counties do not. The State and the county governments should be responsible for funding periodic beach renourishment on a regular basis when the topographical information suggests it to be appropriate as developed by the municipal governments; that is, if we monitor but gradually lose during this five-year period -- there is no big storm where there is a presidential emergency, but we're going to just lose -- that the county and State governments use some of this \$15 million to keep this at that kind of a profile, or to help keep it at that profile, or to meet three-quarters of that profile, or to keep it from getting to a drastic situation where we lose our tourism dollars; that large-scale renourishment by the Federal government be financed every 10 to 15 years if necessary, and also after these major storm events.

That keeps up the tourism dollars that we're looking for in this State. Beaches just in Ocean City alone provide 3 percent of the tourism dollars for the State of New Jersey -- just Ocean City. I don't know what Atlantic City does, what Wildwood does, and what Cape May does, but we're talking about 3 percent of the tourism business being done just in the City of Ocean City alone. So it does generate a lot of dollars, and you've got the \$15 million revolving fund. I think there is a formula here that can be used.

ASSEMBLYMAN GIBSON: Mr. Chairman, before Mr. Deaney sits down.

Thank you, Mr. Deaney. That was very comprehensive. I appreciate what you had to say. You may be able to answer this question.

Mr. Galinis, jump in if, in fact, you do have the answer.

I was surprised to find that there are only two engineered beaches in the whole State if, in fact, that's the way it sets by the time we finish this hearing. The problem may be greater than we think.

Aren't those municipalities that have had Federal projects ongoing -- wouldn't they be considered engineered beaches? Isn't Ocean City, at least this part, considered an engineered beach at this point?

MR. DEANEY: The part that the Army Corps participated in is an engineered beach. If we have any disasters though, FEMA will not have jurisdiction over that part because the Army Corps will maintain jurisdiction. So it's kind of separate from what you're talking about here. But it is an engineered beach, and the Army Corps is committed to continue to come in every three or four years.

ASSEMBLYMAN GIBSON: So you don't really need the FEMA funds because the Army Corps of Engineers is as good, if not better than the FEMA funds?

MR. DEANEY: For the portion that is under the jurisdiction of the Army Corps, that's correct.

ASSEMBLYMAN GIBSON: The south end of your beach is not engineered, and you would be interested in that to be engineered in the long run?

MR. DEANEY: Absolutely, as is the inlet.

ASSEMBLYMAN GIBSON: Thank you.

ASSEMBLYMAN WOLFE: But if there was a storm, they would not be eligible for FEMA moneys because--

MR. DEANEY: We are not eligible for FEMA moneys now from 36th Street to 60th Street.

MR. GALINIS: FEMA is forbidden by law to take the responsibility where another Federal agency is actually there, and it's within their jurisdictional--

MR. DEANEY: But we can't get up to that criteria without massive funding, and I'm not saying that Ocean City needs it any more than the rest of the beaches. We're probably \$100 million worth-- Easily, in my estimation, \$100 million to get all of our beaches up to the standards that we could all have engineered beaches. We'd be glad to spend the money for the engineering. We just don't have the money.

ASSEMBLYMAN NICKLES: Mr. Chairman, through you.

Before you sit down, sir. I'm finally getting a handle on this, and let me see if I can put it, perhaps, in a version that I can readily understand it.

You have the Army Corps of Engineers, who has a certain responsibility. FEMA comes in when there is a major catastrophe, and the biggest problem is that the local communities -- the beach communities -- don't have the funds themselves in order to replenish the beaches. That's where you need a leverage of money, and that's perhaps where the \$15 million is a start -- that the Legislature created in this budget should be going.

If I could use an analogy, when we had this past-- One of the things we tried to do was to tell the other legislators throughout the State that the replenishment of our beaches is similar to road repairs and maintenance during the course of the years. Every so often, "X" number of dollars has to be designated for reengineering or replacing the bed of the road and the surface. Basically, is that what you're facing here? You need money leveraged so that the local communities can keep up with that five-year project instead of bleeding the taxpayers of that community?

MR. DEANEY: Yes.

ASSEMBLYMAN NICKLES: Okay.

MR. DEANEY: But I also want to make myself clear, the \$15 million -- as wonderful as it is, and it really is wonderful -- does not help. It is not enough to make that

initial beach replenishment. The capital that that takes is well beyond that. It would be plenty, in my estimation, for a recurring beach replenishment. If that were to be used in Avalon and Sea Isle now, they could keep their beaches up every three or four years, but that initial amount is not that--

ASSEMBLYMAN NICKLES: Through the Chair. We recognize that \$15 million is only the first-time start, but it was the first time that this has ever been placed in the State budget. I know I, as I'm sure every legislator sitting here, would like to see that expanded. What we're trying to do is have fact-finding to know what to do, how to best use it, and where we can go in the future.

We appreciate your comments.

Thank you, Mr. Chairman.

ASSEMBLYMAN WOLFE: Okay. Thank you.

I'd like to thank you for your information.

As I indicated before, we do have a list of people who have indicated they wish to speak.

We were talking to Mr. Galinis, and you had a question, Mayor MacInnes.

He wished to speak and I told him he had to wait until everyone else was done.

But Mayor MacInnes, since this gentleman spoke, do you have something you'd like to say. I know you had signed up before to speak.

**M A Y O R W I L L I A M M. M a c I N N E S:** (speaking from audience) Yes, sir, if I may. Bill MacInnes, Borough of Sea Girt.

ASSEMBLYMAN WOLFE: Do you want to come up to the microphone, so we can record this.

MAYOR MacINNES: (witness complies) Mr. Chairman, Bill MacInnes, Borough of Sea Girt in Monmouth County. I listened with interest to what the FEMA representative had to say. When I was standing in the middle of a junk pile after

that severe storm in December, and finally the FEMA reps arrived some month and a half later, it was the first time I started to hear about engineered beaches. When I got more information on engineered beaches, I found out we would never be able to afford an engineered beach of any kind -- not like Sea Isle, or Avalon, or Cape May. We are too small to try to engineer a beach, to try to allocate funds for dredging sand directly from the ocean. We don't have an inlet that we can dredge from. Even if we did, we probably couldn't handle that.

When I say "we," I'm talking about any small community up and down the Jersey coast cannot handle that kind of an expenditure with everything else that they have to do. We can do such things as we are doing ourselves, and have been doing: setting up dune tiers, stabilizing them, and planting them. We did that prior to the storm, and we've done that since the storm. But in your criteria, that doesn't count. That's not an engineered beach, although it does help maintain the berm of the beach, and it does help to protect the beach.

If you get a superstorm, then everything goes, including all the work that we have done to set up the dune tier structures -- all gone. Now we start from scratch again, but without your help because we can never, never qualify, insofar as, we don't have the resources to conduct that type of a project.

So I just don't know where your small towns would be going with this program. The big towns, the cities, they have the resources to do some of the work, but certainly not all of it, as we've heard. So I'm sort of mystified as to what FEMA can ever do for a significant number of small communities in the State.

We were told that you would not do any beach work. But now I find out that there is a possibility that you will do some beach work for some communities -- two probably, out of all the communities on the Jersey coast. That sounds kind of limited to me.

I wish something could be done to enable FEMA to do a little bit more in the way of assistance to those of us who have severely eroded beaches. Fifty percent of our beaches are to the point where we probably have to discontinue bathing facilities at those beaches. I don't right now see any way of our being able to continue the buildup of the beach. Some of them are eroded to the point where I can't even build dunes anymore. The ocean is too close now. High tide brings the ocean up to the dune structures.

So we're in a real catch-22 here, and I think that must be addressed by our legislators, because the small towns just won't be able to do a thing except watch erosion increase.

SENATOR GORMLEY: Excuse me. I have a question.

ASSEMBLYMAN WOLFE: Senator?

SENATOR GORMLEY: Mayor, may I ask you a question?

Do you have any estimates of what the cost-- What's the budget in the town? What's your budget, and what's the cost for the projects that you need? Do you have any estimate of the project costs and your overall budget? I just would like to get a comparison to demonstrate what it's like for a small town.

MAYOR MacINNES: Well, the overall budget for the town is only-- I'm talking about for the municipality, not the school.

SENATOR GORMLEY: Not the school, just the municipal budget.

MAYOR MacINNES: It's approximately \$1.5 million.

SENATOR GORMLEY: What's it cost for the project?

MAYOR MacINNES: The project-- We have not really received a cost for the reestablishment of the beach. We're talking about one mile of beach that must be raised up 100 feet -- or rather, moved out a minimum of 100 feet and probably raised 10 to 12 feet. That sand will all have to be dredged in from the ocean. I see no other way of that being

accomplished. You certainly can't truck in that much sand. I think the cost would be beyond belief. So we have not had an initial estimate on what it would take to restore our beach.

SENATOR GORMLEY: But it wouldn't be an off-base guesstimate to say it far exceeds your annual municipal budget?

MAYOR MacINNES: Oh, yes. Yes, definitely.

SENATOR GORMLEY: Okay. I just want to characterize the--

MAYOR MacINNES: Even our percentage would far-- I'd have to stop all the capital projects -- roads, sewers, and so forth -- in order to be able to make any kind of an effort.

SENATOR GORMLEY: You'd just have to stop everything for about four or five years.

MAYOR MacINNES: It seems that would be the case. And then there goes our Moody's rating and everything else for bonding. It would be a severe strain.

SENATOR GORMLEY: Thank you.

ASSEMBLYMAN WOLFE: Thank you very much, Mayor and Senator.

I might add, obviously the purpose of this meeting is to gauge the status of local communities and what their needs are. The Commission will write a report to the Legislature, and also to the Governor, with recommendations. Obviously, this is one of the reasons for our meeting today.

Does anyone have any additional questions for Mr. Galinis? (no response)

If not, Mr. Galinis, thank you very much. We appreciate your testimony.

We have a number of people from the United States Corps of Engineers, and I don't know if anyone wishes to go first. Mr. Pfeifer, Mr. Keon, and Mr. Tunnell?

**J O H N T U N N E L L:** I'm John Tunnell.

ASSEMBLYMAN WOLFE: Okay, Mr. Tunnell, would you state your area of responsibility, and also indicate to the people

here today how the State of New Jersey is divided up project-wise by the Corps from the Philadelphia office, and also from the New York office.

MR. TUNNELL: I'm John Tunell. I'm the Chief of the Project Development Branch for the Philadelphia District. As a result, I'm responsible for all the projects that the Corps ends up implementing through its planning process for the entire Philadelphia District.

In regards to the State of New Jersey--

ASSEMBLYMAN WOLFE: Excuse me. Would you please indicate where that district is.

MR. TUNNELL: Yes, I was going to do that.

For the State of New Jersey, the boundary between the Philadelphia District and the New York District is the Manasquan River. Everything north of the Manasquan belongs to New York, and everything south, including the Delaware Bay, belongs to the Philadelphia District.

ASSEMBLYMAN WOLFE: So therefore the State of New Jersey and its concerns must cope with funding and compete with funding for two different regions, correct?

MR. TUNNELL: Well, two different Corps districts, one division. The North Atlantic Division covers everything from the New York District down through the Norfolk District, so there is one regional office of the Corps that is responsible for most of the northeast coastline.

I'm here today on behalf of the Philadelphia District. Our Colonel, Rich Solosky, (phonetic spelling) was unable to make it today, and I've been asked to make a small presentation.

The Corps of Engineers employs a two-phased planning process in the development of our shore protection projects. The first phase, known as the reconnaissance phase, is 100 percent federally funded -- that's the Corps of Engineers funding -- and is generally about 12 months long.

The primary purpose of this initial phase is to confirm the problems at hand, and to determine whether it is in the Federal interest to address the problems and proceed with further investigations into the cost-shared feasibility stage.

In addition, the reconnaissance phase develops the scope and schedule for future studies, and identifies a non-Federal sponsor willing to cost share in the feasibility study and construction phases.

The subsequent feasibility phase is cost-shared 50/50 between the Corps and the non-Federal sponsor. Now, I should point out that that 50 percent for a non-Federal sponsor also includes up to one half of that amount as an in-kind service, which could be surveys, data collection, various aspects of the details of an investigation. As a result, we get into a much more detailed look at the problems at hand.

This phase includes a formulation process, which is basically the entire planning of a project, that identifies the most viable solution by comparisons of benefits, costs, and environmental impacts of a wide range of alternatives. The feasibility stage is typically three to four years in length, culminating in a report which, if favorable, is submitted to Congress for the authorization of a Federal construction project.

The Corps is studying much of the Atlantic coast of New Jersey and its complex coastal resources as we speak. The following will summarize the status of studies being accomplished by our district.

A limited reconnaissance study was completed in the fall of 1990 under our New Jersey shore protection authorization. This report identified the need for additional studies for hurricane and storm damage reduction, as well as related purposes including water quality. As you recall, back in the late '80s you had all the water quality problems, so Congress involved the Corps in that process, as well as the traditional beach erosion mission.

Currently, the Philadelphia District is evaluating New Jersey's shore protection and water quality problems through a series of site-specific studies for six reaches. These reaches encompass virtually the entire length of New Jersey's Atlantic coastline.

At this time, reconnaissance reports for two reaches of the study -- the Brigantine Inlet to Great Egg Harbor Inlet, and the Townsend's Inlet to Cape May Inlet -- have been completed. Each study has now progressed into the feasibility phase. The Townsends Inlet feasibility study was initiated in December of 1992, and the Brigantine to Great Egg Harbor Inlet feasibility study was initiated in March of '93. In each case, the New Jersey Department of Environmental Protection and Energy is the non-Federal cost-sharing sponsor.

In addition, Federal Fiscal Year 1993 funds were used to initiate a reconnaissance study for the Lower Cape May Meadow, which is located between Cape May City and Cape May Point, sometimes called Lower Township. The primary purpose of this study is for the restoration of fish and wildlife habitat which is negatively impacted by the excessive erosion and flooding along this location. Also, there is flooding and erosion problems for the Town of West Cape May that is included.

Federal Fiscal Year '94 funds are budgeted to expand the study to include Cape May Point due to strong congressional and local interest. Also included in the President's Fiscal Year 1994 budget are funds to initiate a reconnaissance study from Barnegat Inlet to Little Egg Inlet, which encompasses almost the entirety of Long Beach Island.

In addition to the Atlantic shores of New Jersey, we are also evaluating erosion control problems within the Delaware Bay. A reconnaissance study for the Delaware Bay coastline of New Jersey and Delaware was completed and approved to proceed into the feasibility phase. This study identified potential Federal interest in shore protection at a number of

locations in New Jersey including areas near the mouth of the Morris River, the Villas, Reeds Beach, Pierces Point, and Oakwood Beach, otherwise known sometimes as Elsinboro.

The New Jersey Department of Environmental Protection and Energy signed a cost-sharing agreement in July of this year, and we have initiated that feasibility study.

With regard to construction projects, the Philadelphia District has recently completed three coastal projects south of the Manasquan Inlet. These projects are the Barnegat Inlet south jetty, and beach fill at the Cape May Inlet to Lower Township, and Great Egg Harbor Inlet to Peck Beach projects.

The Barnegat Inlet project consists of a new south jetty, channel dredging, and an access walkway on that new jetty. The project was completed in 1992 at a total cost of \$43 million.

The Cape May Beach Nourishment Project was constructed in 1991, and it's first scheduled cycle for periodic nourishment was completed this past April. The Cape May project is currently undergoing some storm rehabilitation construction stemming from last December's severe coastal storm. Total costs for the Cape May project to date are approximately \$16.4 million.

Initial construction of the Great Egg Harbor to Peck Beach beach fill was completed in May of 1993. During this past summer, this project also received beach fill for storm rehab construction. Total costs to date are approximately just under \$30 million.

That completes my formal presentation. If you have any questions, I'll be more than glad to entertain them.

ASSEMBLYMAN GIBSON: Mr. Chairman, the Senator was interested in approximate costs for the Mayor's project. Take Ocean City's for example, you said just under \$30 million -- \$29 million?

MR. TUNNELL: Yes.

ASSEMBLYMAN GIBSON: How many miles did you do?

MR. TUNNELL: We did about four miles, I guess it is.

ASSEMBLYMAN GIBSON: Four? So we're talking \$5 million to \$6 million a mile?

MR. TUNNELL: Yes.

ASSEMBLYMAN GIBSON: So not too unlike a major highway, is it?

MR. TUNNELL: No. It's expensive to engineer a beach erosion project.

ASSEMBLYMAN GIBSON: Thank you.

ASSEMBLYMAN WOLFE: Five million dollars a mile.

MR. TUNNELL: There's a lot that goes into the engineering aspects. There are a lot of environmental concerns. There is a lot of geotechnical work to identify the nature and condition of the sand naturally on your beach versus where you are going to borrow that material from. There are a lot of construction costs associated with access to the beach area. The big dredge that you saw off Ocean City this summer and last summer takes up a large range of locations from which it will operate. We have to identify those borrow areas and properly evaluate the environmental and engineering aspects of that.

Plus, there is the planning process from our perspective. Although it is a small percentage of the cost, it involves the Federal criteria for the Corps of Engineers for establishing a favorable benefit to cost ratio, and also assuring that we have no major adverse environmental impacts. It's a big job.

ASSEMBLYMAN WOLFE: Senator?

SENATOR GORMLEY: Now, if you have taken over a project and there is erosion on that project -- as we went over with the previous set of witnesses -- you're then responsible and you will come back in?

MR. TUNNELL: Our program -- for example, let me take Ocean City for example--

SENATOR GORMLEY: Okay.

MR. TUNNELL: --is engineered for a 50-year economic life. In which case, over the next 50 years we will come in periodically -- and I think for Ocean City it's about every four years -- we'll come in and restore the beach.

SENATOR GORMLEY: Now, let me give you -- I think it's better than a hypothetical. Let's assume -- we'll pick a town -- Sea Girt calls you. They would like to get on your list very much. How do they go about that?

MR. TUNNELL: Normally, we direct them to New Jersey DEPE, who has traditionally, for 30-some years, been the cost-sharing sponsor, at least with our District. There is usually some agreement worked out; some prioritization of when we would get to a particular location, and usually we eventually get there.

SENATOR GORMLEY: How many miles of the New Jersey coast-- We talk about the 170 miles. How many miles are now under the Army Corps, therefore would be exempt from FEMA funding?

MR. TUNNELL: Well, that would only be the Borough of Cape May and Ocean City, and the Sea Bright project, which is just starting.

SENATOR GORMLEY: How many miles are we talking about, nine or ten miles?

MR. TUNNELL: I guess maybe -- probably about 15 miles.

SENATOR GORMLEY: Okay. I assume you have some sort of priority list, or the next sites under review. What are the next prime sites that might very well come under your--

MR. TUNNELL: Well, as I explained, we do have the current feasibility studies working for the so-called seven mile beach area, and the Atlantic City and Brigantine areas. They are currently in the feasibility stage. They are furthest

along in progression to a construction project. It looks like the Long Beach Island and Cape May Point areas are coming along next.

These priorities are somewhat driven by politics and somewhat driven by agreements between the State and municipalities. We sort of respond to that. Oftentimes, though, a lot of politics at the Federal level come into play, and then funds are added and we are told to start at a particular location.

ASSEMBLYMAN WOLFE: Assemblyman?

ASSEMBLYMAN GAFFNEY: I'm shocked to hear politics is involved here. (laughter) Are you saying that Congressman Hughes has more influence than some other Congressman? I find that hard to believe.

MR. TUNNELL: Mr. Hughes has been very successful on this.

ASSEMBLYMAN GAFFNEY: Mr. Hughes has been very successful, hasn't he? It's interesting.

After a municipality-- Do you know of any municipalities in New Jersey that have tried to become eligible through the DEPE, as you said or whatever, and have been unsuccessful?

MR. TUNNELL: Recently, no. Some years back we had -- gee, back in the late '60s we had a large program in New Jersey, but then New Jersey went through a severe fiscal crisis and the entire program sort of dissipated at that point. So we're back into it again.

We're working very smartly -- ourselves, and the State -- to make sure that the funds are there before we commit any resources to go too far along.

ASSEMBLYMAN GAFFNEY: I was just concerned that there might have been a municipality that would have applied through the DEPE and for whatever -- you didn't feel it met the criteria or whatever--

MR. TUNNELL: No, we're not that far along yet. We have to wait for the completion of a feasibility study to determine whether it meets Corps criteria. Up front, the only criteria would be whether there are funds for cost sharing of the feasibility study. Currently, it's usually been New Jersey DEPE that has provided that funding. So we haven't had to get involved with the local percentages yet, although, at Ocean City and Cape May there were local percentages which were met, and I guess the same thing is occurring at Sea Bright.

ASSEMBLYMAN GAFFNEY: We all know, Mr. Chairman, that politics never enters into DEPE consideration.

ASSEMBLYMAN WOLFE: Mr. Tunell, I'd like to thank you for giving us a fiscal jogging of our minds. As you know, the Legislature has provided for \$15 million for shore protection. I'm not a mathematician, and I'm here with my little pen, but we're talking about \$850 million at \$5 million per mile for our beaches. So thank you for waking us up.

Does anyone else have a question for Mr. Tunell? (no response) Okay, if not, Mr. Keon?

UNIDENTIFIED SPEAKER FROM AUDIENCE: I have a question.

ASSEMBLYMAN WOLFE: You have to sign up. Have you signed up? We're not going to be hearing questions yet, sir. Questions are at the end of their testimony.

MR. TUNNELL: Ted Keon is on my staff. He will not be here.

ASSEMBLYMAN WOLFE: Okay. Mr. Pfeifer?

**T H O M A S P F E I F E R:** Good morning, I'm Tom Pfeifer. I am the Chief of the Ocean and Estuary Section in the Planning Division from the New York District Corps. As John Tunell just mentioned, the New York District covers the area from the Raritan Bay area of New Jersey south to the Manasquan Inlet.

Thank you for the opportunity to be here. Colonel York from the New York District was unable to make it, and Mr. Bruce Bergen is on travel. He's the Chief of Planning. I

think he had planned to be here this morning. He asked me to come down and just mention to you the jobs that we have ongoing in New Jersey. I'll mention them to you, starting with the Atlantic Coast.

I know it was already mentioned this morning. We have the Sea Bright to Ocean Township portion of the shore project. It is about 12 miles long. It calls for an engineered beach -- a designed beach -- that would run about 12 feet above mean low water in height, and would have a berm about 100 feet wide. There would also be the notching of approximately 15 groins in that area.

The renourishment cycle: There is planned renourishment for those beaches after the initial construction that would be approximately every six years. I mention that I think that's kind of an interesting number compared to what you've heard this morning regarding the FEMA criteria.

The project cost for the Sea Bright to Ocean Township reach is a total cost of \$183 million. That includes the State's construction of the seawall up in Sea Bright. The remaining cost, as the seawall is essentially completed, is \$143 million, of which approximately \$40 million would be non-Federal, which would be State, county, or a portion to the local communities.

The first construction for the Sea Bright to the Ocean Township area will be focused on the Sea Bright and Monmouth Beach areas, one of the most critical portions of that shore. We expect to start that sometime in our Fiscal Year '94. Fiscal Year '94 for the Federal government begins this October 1. Subsequent contracts moving further south along the beach would be initiated in approximately one- to two-year increments following that. As I mentioned, that project is ready for construction within the next number of months, or perhaps the next season when we're able to advertise bids for it.

The southern portion from Asbury Park to Manasquan Inlet is a similar beach design. It also has a 100-foot-wide berm. There is no dune, by the way, in either of these projects. It is a 100-foot-wide flat berm, approximately 12 feet above mean low water. The cost for the Asbury to Manasquan reach is approximately -- it's \$48.5 million, of which about \$17 million would be non-Federal. The nourishment cycle for the Asbury to Manasquan reach is also approximately once in every six years.

Both of these projects, as John Tunnell mentioned, require considerable environmental monitoring to ensure that the projects interface with the environment as we've expected. Slight modifications to the nourishment procedures could be done, depending on what we determine during monitoring and what its impact is on the environment.

That's the oceanfront area of the Jersey shore for the New York District. We have just recently -- in fact in March of this year, 1993 -- completed a reconnaissance report for the Raritan and Sandy Hook Bay area. The reconnaissance report looked at all the communities from the mouth of the Raritan River on out to essentially the -- to where the Navesink River is, or just short of Sandy Hook itself.

The reconnaissance report was favorable in that it recommends future study in the form of a feasibility study for the areas of Port Monmouth, Leonardo, Highlands, Union Beach, and Keyport. It also recommends further study for the Cliffwood Beach area in Aberdeen, but we expect that we will use another ongoing study authority to look at that one. So that the Cliffwood Beach area would probably not be part of the Corps' shared feasibility.

John mentioned that the cost of the studies is a fraction of the construction costs. It's certainly the case. I mentioned some very large figures to you. The estimated cost for the feasibility phase, which would be split 50/50 with --

to this point, it would be the State -- would be somewhere in the \$1.5 million to \$2 million range to study the Port Monmouth region and design a project for the Port Monmouth area of the Raritan/Sandy Hook Bay. The project that surfaced during the reconnaissance phase for that area would have a cost of about \$7.2 million.

That's basically the construction and study involvement for the New York District Corps in New Jersey. It essentially covers, probably, all of the open coast of the New Jersey shoreline within our District region.

Other projects that affect coastal areas will be future studies on the Arthur Kill primarily for navigation improvements; and in the Lower Hackensack River Basin, primarily the Meadows areas -- the areas affected by tides. The Hackensack River Basin investigation is just a study at this point. It will be entering the reconnaissance phase.

That completes my prepared statement.

ASSEMBLYMAN WOLFE: Does anyone have any questions?  
(no response)

I'd like to thank you. At the last meeting, I believe, representatives from the State indicated the status of some of the projects. Senator Ciesla asked the question about the priorities or the stated timetable for the projects north of the Manasquan Inlet. They seem to be following the reverse flow of the ocean. The tides basically carry the sand north, and the projects are beginning at the northern end of the region and then following south. His question was, "Wouldn't it have been more realistic to start at the lower end and build it up that way?" The response he got was, "It was already in the program."

MR. PFEIFER: Yes, he's correct. From a strictly coastal engineering point of view, it would probably be advantageous to work from the updrift of the southern end of the beaches to the north. However, the most critical areas of

the shore that are in the news every time we have a storm are up in that Sea Bright area, so that's where the initial construction was focused. Areas that were considered at the time the studies began -- back in the mid-'80s-- Actually, these were studied back in the '50s and '60s, but there was a lull. At that time, I don't believe the State was ready to participate, so with the occurrence of the additional storms there was renewed interest. So we focused on those areas that were most critical.

There is an allowance made in the design for constructing from the northern end to the south, and those designs include temporary feeder beaches that will act as an extra slug of sand that will move -- that will drift northward for each increment that's constructed.

SENATOR CAFIERO: Mr. Chairman?

ASSEMBLYMAN WOLFE: Yes.

SENATOR CAFIERO: Just so all of us, or me in particular, can get a handle on the figures we're talking about, you said \$5 million a mile to make all these beaches engineered beaches? Is there any way we can get a handle on the figures that, had all these beaches in New Jersey been engineered beaches over the past, what that may have related to in savings to your expenditures by storm damage?

MR. GALINIS: If the beaches are under the jurisdiction of the Corps, they would not fall within our criteria to start with. They are responsible.

SENATOR CAFIERO: Okay. I'm not trying to fix responsibility. I'm trying to fix all New Jersey. If all of New Jersey's 170 miles of beaches had been engineered beaches -- looking back over the past five years what was spent to go back after the damage control -- is there any way we can figure out what would have been saved and not been necessary by damage control had those beaches been engineered?

MR. PFEIFER: It would be very difficult to make any kind of estimate like that. If you had an engineered beach, it would have survived some of the storms that we've had, certainly, in much better fashion than the present condition of the beaches. But it's pretty hard to say.

Our renourishment cycles, which include a large amount of sand in anticipation of normal storms that would occur over the 50-year project life-- That estimate would be-- That estimate is based on what we expect to happen to the engineered beach, as to what has to be expended to renourish it.

Just what would happen if we had built it five years earlier, I really don't know.

ASSEMBLYMAN WOLFE: Thank you.

MR. TUNNELL: I think I could help out on that.

ASSEMBLYMAN WOLFE: Yes.

MR. TUNNELL: I think you ought to look at it more from the standpoint of the total cost that you would save, as opposed to just the cost of the project. For example, I'll take Ocean City. We would have saved-- We have saved more than the value of that project probably already in the past couple of years of storms that we've had, just in the damages that we've prevented to the oceanfront development.

SENATOR CAFIERO: That's what I'm trying to get at. If we're looking at approximately \$5 million per mile for 170 miles--

MR. TUNNELL: You're probably protecting locations that exceed that value in damages that occur.

SENATOR CAFIERO: That would have happened had the beach not been engineered?

MR. TUNNELL: That would have happened had the beaches not been in place.

SENATOR CAFIERO: Well, that's the figure I'm trying to get at, because we're trying to find a way to fund an \$850

million project. I mean, if you can see the savings by spending that money, maybe we can get some combination together between--

MR. TUNNELL: I think Ocean City could speak for that for us, because they've gone public with some of that. But that's, you know-- From our perspective, the Corps -- the benefits have to outweigh the costs, and our benefits are structural damage prevention to the oceanfront properties, for the most part, because recreation isn't in vogue, hasn't been in vogue since the Carter administration. So we're basically in the structural-saving business, and we will not construct a project if the benefits don't outweigh the costs. So we're projecting costs, like Tom says, of \$143 million. We have our projects. The benefits by far exceed that as far as the savings that would occur over a 50-year economic cycle.

SENATOR CAFIERO: Thank you.

MR. DEANEY: To your question, exactly, Senator: We have estimated that if we did not have this beach project in place last year, accelerating it one year, we would have lost \$100 million worth of -- there would have been a \$100 million loss to the economy. That's broken down this way: As much as \$25 million from property damage. That's an estimate, because we wouldn't have known exactly what would have been lost, but considering the boardwalk and the beachfront property in the primary boardwalk area-- We have a \$500 million tourist business, and we estimate that would have been affected at least by the balance. So our overall estimate is \$100 million.

The cost of the project alone was \$29 million, as I said. The property damage would have been about the same. The rest would have been through loss of tourist business.

SENATOR CAFIERO: If we could get some master mathematician who can equate all these losses going down the line -- whether it's taxes into the State of New Jersey by loss of the tourism business, the cost of properties, and who would

have to foot the bill for that -- that's what we're going to have to get our handle on to find out where we can get a package together that makes it worthwhile, as you said, to fund this thing and get this stuff all out of the way. That's a possibility any more.

So those figures are vital--

MR. DEANEY: In relationship to Ocean City, those numbers could be projected. We have 8 miles of coast, you have 125 or whatever you have.

SENATOR CAFIERO: Thank you, Mr. Chairman.

ASSEMBLYMAN GIBSON: Mr. Chairman, building on the area that the Senator has taken us, to the Army Engineers: You include in your feasibility studies the actual savings in damage costs. That's part of the study. These studies that are in progress and that we'll be seeing will show the savings that we certainly would save as to destruction from a storm, right? Isn't that so?

MR. PFEIFER: Yes, yes, absolutely.

ASSEMBLYMAN GIBSON: Are you studying the whole coast? I heard so many projects -- study projects -- does it include the whole coast?

MR. PFEIFER: It appears that we've covered most of the coast. The Corps does its studies wherever it's authorized to do them, so we have a separate authorization for the Atlantic coast. We have a separate authorization for the Raritan/Sandy Hook Bay area. But since we're looking-- It appears from the New York District's end, we're covering all the New York District coast of New Jersey, and I think John had mentioned that with his completed projects and the studies ongoing, he has most or nearly all of the southern Jersey coast covered.

ASSEMBLYMAN GIBSON: So we're establishing a good base of planning as to how to solve the problem that is everybody's problem in this room.

Let me share some figures with you that staff has presented to us. Assemblyman Wolfe talked about maybe \$800 million to \$900 million worth of construction, beach nourishment, etc. up and down the coast to get it in check; thereafter, we would be eligible for storm aid or continuing work by the Army Engineers in the 50-year thing. That sounds like a lot of money. That's the total cost, and it may be more than that. But as a round figure, that's the total cost. The local share and the State share would be less because the Federal government is committed to some 65 percent or thereabouts.

Let me share some figures with you -- just to put that in perspective -- of what the Federal disaster aid came to in New Jersey for the past couple of storms. These two winter storms that we had, if I've got the figures right, were \$252 million. Now, that's like one-quarter of what we're talking about for the total project cost.

So it seems to me that this is entirely feasible. This is something that we should really be approaching, and rather quickly. That was made up of-- Just to show you, that included private damage -- individuals, business administration loans because of loss of business, somewhere around \$47 million for business, \$159 million of public funds, \$10 million funds for another area. The total was \$252 million on these figures that we have.

So it does show me that if we're going to save \$252 million -- because that was wasted because of these storms -- this kind of an approach is very necessary and very practical.

ASSEMBLYMAN WOLFE: I'd like to thank you very much. I'd like to ask if you and representatives from your office, and Mr. Galinis could remain during the questioning? Perhaps the public will have questions that they would like to ask beyond what we've asked.

Mr. Bernard Moore, of the Department of Environmental Protection and Energy, is with us in the audience. He gave us an excellent report at our last meeting.

Bernie, would you like to speak? Do you have anything you would like to present today? I guess you do; you've got your folder with you.

**B E R N A R D J. M O O R E:** No, Mr. Chairman. I'm just here to give some credence to the idea that we are a working partner with the Army Corps of Engineers. We have been; we work very closely with one another. Your assumption that all of the coast is under study is correct. It is our idea that that way, with the Army Corps projects, we can get the bigger bang for our buck, reduce our costs, and also maintain the coastline in a reasonable fashion.

So I'm just here to answer any questions that you may have at the end.

**ASSEMBLYMAN WOLFE:** Okay. Thank you very much.

At this time, I'm going to switch seats with Assemblyman Gibson. He is the Vice-Chairman. I have to either go put money in the meter or get arrested, so-- (laughter)

**ASSEMBLYMAN GIBSON:** You're leaving?

**ASSEMBLYMAN WOLFE:** No, I'll be back.

**ASSEMBLYMAN GIBSON:** Then we won't switch seats; we'll just switch responsibilities.

**ASSEMBLYMAN WOLFE:** Oh, we will. Then before I leave, we will proceed with the testimony of people who have indicated that they would like to speak. I think what we'll do is just follow the order of the yellow sheet, first of all, because that was circulating first. Some of you have come up since we have begun and signed up on these white forms.

There are four people from FEMA. Do you wish to speak, Mr. Duel, Mr. Dobinson, Mr. Jellets? Did anybody wish to speak? (negative response from audience) Can you stick around?

UNIDENTIFIED SPEAKER FROM AUDIENCE: Certainly.

ASSEMBLYMAN WOLFE: You were in Bricktown, weren't you? I saw you there.

Okay, Mayor MacInnes, you've spoken. Do you wish to speak again?

MAYOR MacINNES: Yes, sir, briefly.

ASSEMBLYMAN WOLFE: Here's your chance.

MAYOR MacINNES: Gentlemen, my first thing is a question to FEMA. Now, I heard a figure of \$292 million--

ASSEMBLYMAN GIBSON: Two-hundred fifty-two.

MAYOR MacINNES: Two-fifty-two. So far you've delivered 20 percent of the money to our borough, of the FEMA funds that we were initially scheduled to get. Now here we are some nine months later. I'm wondering where the other 80 percent of these moneys are being held, and why are they being held when we've submitted all the necessary documentation? Is there some plan now to start phasing that money into the towns that need it?

MR. GALINIS: The process is that the Federal government, as it does its damage survey reports and we process them, we turn the funding and the responsibility for the management for the program over to the State of New Jersey. That is the same in any state or anywhere that FEMA goes.

To answer your question, I'd be talking out of school as to why the State of New Jersey has not provided any funding to your community, or only up to 20 percent. I cannot answer that, sir. We have provided the funding to the State.

MAYOR MacINNES: Well, I feel the time has come now that somebody has got to start pushing this.

ASSEMBLYMAN GIBSON: We'll acknowledge your concern, and through staff we'll try to get an answer as to where the balance of your FEMA money is.

MAYOR MacINNES: Fine. My main comment is this: It was touched on with the Army Corps' project that references the

FEMA beaches and the time that's going to take place between now and when the ongoing project finally reaches the beach sections or reaches in southern Monmouth County. That's some 10 miles of beach, or more.

You're saying one to three years. Well, we know it isn't going to be one year. It's going to be probably three to four years, and by that time, I think erosion will nicely take care of about three-quarters of our beach. Now, have you ever looked at a beach that is completely stripped of its sand. People think that the sand on a beach goes right on down; it keeps on going. Well, it doesn't. There happens to be compressed layers of clay and gravel down there -- black clay, round clay, and gravel under the sand. This year after the storm, we witnessed half of our beach in that state -- no sand, clay and gravel. That's what I'm afraid we're facing in the future if something isn't attempted by the Army Corps. The way I see it, the feeder beach has a lot of possibilities.

If you could preestablish feeder beaches along the stretches of New Jersey beachfront areas that are not going to get the project for three, four, or maybe even five years from now, I think the feeder beach could help alleviate some of the long-range erosion that's going to take place, lessening your costs in the long run because there will be less erosion to try to deal with. It will give us at least some time to try to realize an accretion of sand for our beaches.

We really have reached that point where there is nothing else that will satisfy us. Besides the project, there is nothing else that can be done by the State or by the municipality that is going to alleviate the condition of erosion that we're experiencing right now.

The feeder beach was something the Army Corps tried back in 1967. They built the feeder beach at Sea Girt National Guard base. It worked; it worked quite well. It was a one-time shot. They went out and they dredged sand from about

a half a mile or so into the Sea Girt National Guard beach. They built up a tremendous pile of sand, which constitutes the feeder beach, because then during the year that drifts off into the littoral flow, which in our half of the State -- from Barnegat north -- is from south to north, and down here is from north to south.

But it doesn't seem to me that that's a horrendous project for the Army Corps to take care of. You're establishing three or four feeder beaches along that section of beaches that would work for us over a long period of time and give us something before you finally get around to getting the moneys, which we know are going to be very difficult with the squeeze on the Federal budget and the squeeze on the State budget. The counties, I've given up on. I don't think the counties that aren't participating in beach restoration now are going to be convinced that they should do it in the future, because their costs are also going up. They didn't contribute before for that reason. I can't see them contributing now.

So in other words, what we're looking at is quite a few communities on our seacoast -- New Jersey coast -- that aren't going to get anything for a very long period of time. But I feel that these feeder beaches have a part to play in restoring and offering some partial restoration of some of our beaches. I'd like to see that reviewed and at least looked at. I'm not asking for construction, just the feeder beach.

Thank you.

ASSEMBLYMAN WOLFE: Thank you.

Is Mr. Moore still here. (no response) Okay, we'll talk to him later.

Thank you, Mayor.

Ms. Elizabeth Bergus, Strathmere? You can have a seat.

When you people come up, you can have a seat.

E L I Z A B E T H R. B E R G U S: That's all right. I just want to make a few comments on this.

I think the Army Corps of Engineers has left out one area, which is Corsons Inlet to Townsends Inlet in their study, and certainly the BIB Committee of Cape May County Beach Inlet and Bay has requested that they include this.

Now, we've heard about Sea Isle City's engineered beaches, but to the north end, four to five times last year that road was impassible. There is no engineered beach there. By the same token, they're isolating the community of Strathmere when that road goes out. That road also happens to be designated by OEM as the evacuation road, and at the very beginning of any storm, as Assemblyman Gibson will tell you, it's out. It's gone, because it's not cost-effective.

That's the dirty word, I think, that all of you gentlemen-- I wish you would look-- It's the dirty word. I've heard this in the BIB Committee; I've heard it from the Army Corps of Engineers; and I've heard it from-- It's not cost-effective.

Now, you've got a major highway going down there, which I think is cost-effective. The community may not be, but there it is. So I am requesting that you ask the Army Corps of Engineers to do a study, totally, along the coast. Include everything. We did ask them to include that Reeves Beach area, and they did that. But now they've left a vital portion out. Thank you.

ASSEMBLYMAN WOLFE: Thank you. You mentioned the BIB Committee?

MS. BERGUS: BIB -- beach, inlets, and bays.

ASSEMBLYMAN WOLFE: I notice going through the roster of people who wish to speak, there is a Mr. Gourley -- John Gourley.

Do you also wish to speak? (affirmative response from audience) Come on up.

J O H N G O U R L E Y: My name is John Gourley. I live in Wildwood Crest, and I'd like to speak about Cape May Point.

Over the years -- and I've done some research on this -- in 1714, the Cold Spring Presbyterian Church was founded on the shores of the Delaware Bay. Since it's been moved into the interior, the old site is now over a quarter of a mile out into the Delaware Bay. So in 279 years since the church was moved out of there, there has been an erosion problem averaging seven feet per year.

My question to the Engineers is, what possibly can be done to save the Cape May Point area. I know I've fished out here for 45 years, and I know quite a bit about the channels that run around Cape May Point, and the erosion problem that builds up there. Across the mouth of the Delaware Bay, there are sand hills that run from Cape May Point all the way over to the ship channel on the Delaware side. We wonder what they're going to do to save the Borough of Cape May Point. I know they've done a lot of work down there, but I saw the other day, when I ran my boat through the concrete ship-- It used to be a whole ship but now it's falling apart through erosion so that there's a channel that goes right through the ship.

I'm trying to find out, for the benefit of the BIB, what the Army Engineers can do, or plan to do about trying to save Cape May Point.

ASSEMBLYMAN GIBSON: Mr. Gourley, before you leave, you should know that we're very sensitive to the problems of Cape May Point. As you may know, there is hopefully a pilot reef project that is going to go in down there. While that only affects about 1000 feet of beach, we're looking for, with enthusiasm, the results of the that. Some of the other speakers who are here today I hope will share with us some of the results in Avalon in particular, where one is already in place. We hope that may lend some help to Cape May Point.

MR. GOURLEY: I know there was one of those artificial reefs put in at Sea Isle City, but they took it out. I went down and inspected that at an extremely low tide. It was

working, but then the municipalities like to beautify their beaches and make them nice for their tourists, so they bulldozed all the sand that that thing built up so it wouldn't be a lump of sand in the middle of the beach.

ASSEMBLYMAN GIBSON: The original installation at Sea Isle City was an earlier generation of the product that is going in now. Also, the location in Sea Isle City I don't think was well-chosen, in that there was some sod at the location. I think the structure sank in.

So we're looking forward to the results of the one in Avalon, as you sound like you're aware of. Maybe when the speakers from Avalon have something to say today, we'll hear some of the hopefully good results that they may be finding there.

MR. GOURLEY: All right. Thank you very much.

ASSEMBLYMAN WOLFE: Excuse me. Before we have the next person come up, I really had a question, maybe for clarification. The Mayor of Sea Girt raised a question, and I need some clarification. Mr. MacInnes indicated that FEMA had indicated that they would reimburse the town for certain expenses. Twenty percent had been received, and he's indicating that eighty percent was not received. The representative from FEMA indicated that that money had been turned over to the State.

MR. GALINIS: It's in the State's hands.

ASSEMBLYMAN WOLFE: Okay. Now, I was going to ask Mr. Moore. Maybe this isn't in your area, but do you know the process for releasing that money that has come from FEMA to the State?

MR. MOORE: The money comes from FEMA and it goes to the State Police, the Office of Emergency Management, who then disperses it to the communities and to the other agencies.

ASSEMBLYMAN WOLFE: Okay. We'll follow up. Thank you. We have several Smiths who wish to speak.

SENATOR GORMLEY: Simultaneously?

ASSEMBLYMAN WOLFE: I don't know.

ASSEMBLYMAN GIBSON: Mr. Chairman, someone had indicated to me they have somewhere to go. Can I interrupt your schedule for a second and give Freeholder Gessel a chance?

ASSEMBLYMAN WOLFE: As long as the parking meter doesn't get me, that's okay, sure.

GARY GESSEL: Gentlemen, thank you. I appreciate you interrupting your schedule. I will be brief and not redundant. Mr. Deaney from Ocean City, I think, brought out a number of very important points and drove home exactly what the problem is.

Essentially, it's good to hear that everyone realizes that we have a beach erosion problem and that we need to do something about it, so we won't go into the need. But really what it comes down to is a plan that is funded. The problem with the issue is basically the funding. I think we know pretty much where the beach erosion is. Through Bernie Moore-- I heard Bernie say a number of times that he can put the plan in place, but where is the money going to come from? The municipalities don't have it; they are unable to do it. The counties are very, very concerned, but quite frankly, it's beyond the county budgets also. The funding really needs to come from a combination of State and Federal, with help from the counties and help from the municipalities.

What I would ask you to consider and to bring back is, put together some type of process that is going to put together that plan, and some type of funding mechanism that does not require the municipalities to engineer a beach first, before they become eligible for the funding.

I'm here today not only as a Cape May County Freeholder, but also as a representative of the Jersey Shore Partnership. Tom Gagliano, who is the founder, is recovering and doing very well, but was unable to make the trip down

today. He asked me to speak for the Partnership. That group had labored very, very hard for the stable source of funding that was brought into the process last year. We recognize that that was a very difficult thing to go through for the Legislature, but that is only the first step.

We need more money. We need it quickly because we have the ideas here of what to do. The municipalities cannot afford to put in an engineered beach based on the way the current process is set up. Somehow, there has got to be a change to that process to enable for engineered beaches to occur now, and then for funding to work for the shared costs between everyone involved with the project.

I won't say any more. I know you have other speakers. I do appreciate you letting me make my comments. Thank you.

ASSEMBLYMAN WOLFE: Thank you.

I'm going to ask for Mr. Robert Smith, from Cape May City.

R O B E R T S M I T H: Thank you. I am the Municipal Coordinator for the City of Cape May. As you know, we're the recipients of the beach renourishment program. Also, as stated earlier, Avalon and Sea Isle City are the only two engineered beaches in the State of New Jersey. Naturally, we're very close.

My question is, with the renourishment program in place and the profile studies, I believe, have been undergone, what is left to become an engineered beach at that point? We certainly have been enhanced by the renourishment program, and we would carry through to become an engineered beach.

I guess Mr. Tunell would be able to respond to that.

ASSEMBLYMAN GIBSON: Did you hear his question, Mr. Tunnell?

MR. TUNNELL: (speaking from audience; no microphone) Yes. I think what we are dealing with here is, we have our program for restoring beaches versus the FEMA SITUATION. What

the FEMA folk mentioned was fortified (indiscernible). They sort of lose jurisdiction in the declaration. So we have the authority. We have been out there already this year to renourish. We go back every two years, and then we were inundated with another major storm that exceeds our nourishment cycle. We have the authority to back out--

MR. SMITH: Okay, thank you. It is probably something you will pick up-- It sounds as if there are still requirements to go before we become a complete engineered beach.

MR. TUNNELL: You don't need that. The Corps of Engineers' product--

MR. SMITH: We don't fall under FEMA.

MR. TUNNELL: If you don't fall under FEMA, we will come back out and restore the beach so it meets certain laws.

MR. SMITH: Thank you.

ASSEMBLYMAN GIBSON: You won't have to worry about it for about 45 years or 47 years, depending on when your--

MR. SMITH: I understand that. I was just trying to see the difference between the two as far as the engineering studies go.

ASSEMBLYMAN GIBSON: Actually, I think they are even financially better off-- Is the percentage higher when the Army Engineers are in there?

MR. TUNNELL: It's 65/35 for initial and periodic nourishing.

ASSEMBLYMAN GIBSON: And the percentage with FEMA?

MR. GALINIS: After a declaration, it is 75, Federal share.

ASSEMBLYMAN GIBSON: Well, you are not quite as well off.

MR. TUNNELL: Well, Cape May is better off, because they are unique and actually they are 90/10 because we had a problem attributed to the Cape May jetties. There is a whole different formula that we got into there.

ASSEMBLYMAN GIBSON: I would build a few more jetties like that.

All right. Thank you, Mr. Smith.

A question occurred to me earlier that may be worthwhile: The two municipalities that are engineered -- Avalon and Sea Isle -- after a period of time, as long as there is a FEMA in place, they will always be eligible for reimbursement through FEMA?

MR. GALINIS: As long as they continue to meet the criteria of engineering their beach to the profile. As long as they do the beach renourishment, they maintain a capital budget and are using that money, and meet all the criteria for what we classify as an engineered beach, yes.

ASSEMBLYMAN GIBSON: And it has to be a Federal declaration as well.

MR. GALINIS: That's right. We do not come in before a Federal declaration.

ASSEMBLYMAN GIBSON: So they could have serious erosion on an engineered beach that was not eligible for a Federal declaration, and then they would suffer; whereas, if the Army Engineers did, in fact, construct the beach, they would be guaranteed that the beach would be maintained for the next 50 years. I don't know which one is the best. Actually, they are both worthwhile to have.

All right. Harry Butts will be the next person.

**H A R R Y d e B U T T S:** Harry deButts.

ASSEMBLYMAN GIBSON: Harry deButts. I'm sorry.

MR. deBUTTS: I am the Director of Public Works for Avalon. I am also the Office of Emergency Management; I am the Coordinator for Avalon. I wanted to let you know that the administration and Council in Avalon are strongly behind the Beach Commission, in that we have taken the bull by the horns ourselves and have run with it. The cost of doing that and of looking down the road to the future costs-- We feel that this is the right way to go.

The relationship we have developed with FEMA, the Army Corps, Bernie Miller, the DEPE, and the State Police, who is the OEM, has been outstanding. The information about the Stafford Act was made available to us in 1987, when we did our initial beach fill -- our \$5 million beach fill -- and the criteria we had to follow to maintain the engineered beach we had then. That led to our getting earth movers and bulldozers through surplus at nominal costs and developing an annual budget in our municipal budget to move sand where we had sand that accretes, because maintaining a profile means two things: It means keeping it down where it builds, and keeping it up where it dies. It is a two-sided sword. It isn't just where it goes away. It is maintaining the profile.

So we got a permit through DEPE to move the sand on our south beaches, which accrete sand, and transport it north during the winter season, outside of the wildlife problems we have, to the north side where we have the erosion problem.

The other factor which should not be overlooked is, when you have a disaster strike time and again, time and again, time and again, there will come a time when FEMA is going to say, "Enough is enough. You have to deal with the problem, not just the disaster." That is what has led to the artificial reef that we installed in Avalon. It is something we are doing to try to preclude a strike again, again, and again. We did get hurt seriously in the Halloween storm. That was where we had our biggest erosion, and we got nothing. Even though we had the engineered beach, without the presidential declaration, because no other towns have done it, there was nothing to be had. So we had to fund the costs of putting the sand back on our beach following the Halloween storm to match a profile that we then got when we had the January 4 strike, because you don't get the whole beach fill; you only get that part that was actually damaged during the event. So if you had erosion

before the event, you have to be able to document what it was. So you need the before and after the event documentation, which we do with our Dr. Farrell from Stockton State College.

ASSEMBLYMAN GIBSON: Harry, we're glad you're here. We are both proud of what Avalon is doing. Many of the other municipalities are envious, I am sure.

Is anyone else going to talk about what the status is, or the results so far as measured from the pilot reef?

MR. deBUTTS: We would like to have Dr. Bruno from Stevens Institute be the speaker on the results of the reef project, because he is the technical expert who not only did the initial tank testing of the device, but is also under contract to provide us with the technical data of what the results will be.

ASSEMBLYMAN GIBSON: And that will not be today.

MR. deBUTTS: It won't be today. We haven't actually had a storm event of any magnitude that would say yes or no to anything.

ASSEMBLYMAN GIBSON: Okay. Staff just advised me that that is on the agenda for our next hearing.

MR. deBUTTS: Right.

ASSEMBLYMAN GIBSON: I think there are some questions, though, about engineered beaches. You live with it, and it's practical. One that was suggested was scraping with bulldozers, where you might go down to the low water and scrape it up. If that is done and you bring it back to the contour--

MR. deBUTTS: Right.

ASSEMBLYMAN GIBSON: --that you engineered in the first place, you are able to successfully bring it back to the contour, the work of doing that bulldozing-- That effort is not necessarily eligible for FEMA reimbursement?

MR. deBUTTS: Not at all. That is our contribution to demonstrate to FEMA that we are, in fact, expending Borough funds to meet their criteria.

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ASSEMBLYMAN GIBSON: When they do come in and give you money, you still only get a percentage of that money?

MR. deBUTTS: Yes. It's 75/25. The Governor, in the last disaster, said that the State government would pick up the 25 percent. At least that is what I was led to believe. But to say that FEMA is reconstructing our beaches is not true, because the January storm, which was preceded by the Halloween storm-- The loss we had in the Halloween storm, we had to eat completely.

ASSEMBLYMAN GIBSON: Because there was not a Federal declaration.

MR. deBUTTS: No declaration. So even though it is an engineered beach, the loss was totally Avalon's.

ASSEMBLYMAN GIBSON: That was the Halloween storm?

MR. deBUTTS: Correct.

ASSEMBLYMAN GIBSON: The January storm there was a Federal declaration?

MR. deBUTTS: Correct.

ASSEMBLYMAN GIBSON: And you do expect reimbursement?

MR. deBUTTS: Yes.

ASSEMBLYMAN GIBSON: Did you get your reimbursement?

MR. deBUTTS: We have gotten a percentage of it. Again, there is a misunderstanding on the paperwork flow--

ASSEMBLYMAN GIBSON: Always.

MR. deBUTTS: --because that is a monumental undertaking with any Federal agency, I find. I don't necessarily say it is a FEMA problem or a State problem; it is a problem in going through the paperwork that has been established as what we are supposed to do following these disasters. I don't say it is FEMA's fault or the State's fault; it is just the system.

ASSEMBLYMAN GIBSON: Checks and balances.

Assemblyman Gaffney, did you have a question?

ASSEMBLYMAN GAFFNEY: Maybe not so much directly at you, but just a question to both FEMA and the Army Corps. I guess I am trying to decipher what I am hearing here today. There is a note here from our staff that this Commission we wish to consider -- that any municipality that has participated in the Corps of Engineers' Shore Protection Beach Fill Project possesses, by definition, an engineered beach. Have we all agreed on that now? I just want to make sure. Therefore, it really isn't a decision that this Commission has to-- It can be--

ASSEMBLYMAN GIBSON: Either/or.

ASSEMBLYMAN GAFFNEY: Either/or. But once the Corps gets involved, then the end product is an engineered beach. Okay.

ASSEMBLYMAN GIBSON: And in Ocean City's case, the north end is engineered where they have had a Federal project, but the south end is not as yet engineered.

MR. deBUTTS: The Army Corps study that is currently going on along with the seven-mile beach-- They have a completion date for a wrap-up of this of a 1996-'97 time frame, which then goes back to the Federal government for funding for whatever projects they determine would be appropriate, which means you are looking at 1998, 1999, or the year 2000. The question is getting from here to there. So I ask you to consider that.

ASSEMBLYMAN GIBSON: Thank you very much for your comments.

SENATOR CAFIERO: One question, Mr. Chairman: How difficult was it to separate the damages that resulted from the January storm with the override from the October storm for which you qualified for FEMA help?

MR. deBUTTS: We immediately, after any given storm event, anything of any significance, have Dr. Farrell come in and do a profile study -- immediately after the event. FEMA

did come out to do a survey to determine whether or not a declaration would be, in fact, given, following the Halloween storm. It was then determined that there was no damage that could be documented to make it a declaration. So Dr. Farrell had actually done a study right after the Halloween storm, and we knew where we stood. So that gave us the information to know what happened to us on January 4.

SENATOR CAFIERO: Had you not done that, or had those storms come closer--

MR. deBUTTS: Yes, it would have been a real problem. You have to be able to show what your loss was from that particular event.

SENATOR CAFIERO: So if you hadn't done that, they came so close, back to back, that you didn't have time to do it, you would not have gotten reimbursed, or you--

MR. deBUTTS: I don't know. That would have to have been, I guess, an item of discussion. You know, we have a good working relationship with FEMA and everybody, but we do have our differences and we do have our closed door sessions.

SENATOR CAFIERO: Thank you.

ASSEMBLYMAN GIBSON: Councilman Lemma? Councilman Lemma is from Wildwood. Wildwood has some sand to--

SENATOR CAFIERO: Yes, sand for sell. We have three miles of it; three miles of running beach.

ASSEMBLYMAN GIBSON: Sand for sale. They have other kinds of problems.

ASSEMBLYMAN GAFFNEY: Is it true that Wildwood is going to have to install a tram from the Boardwalk to the ocean?  
C O U N C I L M A N J A M E S A . L E M M A: Well, it sounds ridiculous, but I am here-- All right, everybody has beach erosion. After every storm, our beach is longer. Here is what we are really concerned about. It is affecting our ourflow line. I was here more to talk, like, to the Engineers that it is affecting our ourflow lines, and we are not going to have the moneys to replace these ourflow lines.

Now, our local engineer tells us that it is not going to be too long and, you know, we are going to have to replace them. So it is storm-related, even though, you know, it seems ridiculous -- erosion -- we are suffering from extension. In the last storm, if you had come down to Wildwood, you would have seen a big mound of sand right on down about 30, 40 feet off the waterline. We had to send our Public Works down there with the backloaders and the front-end loaders.

It sounds ridiculous, but it's, you know, going to affect our outflow line. That is the only problem.

ASSEMBLYMAN GIBSON: It's a--

COUNCILMAN LEMMA: Excuse me. The only damage we had was in the back bay when we had the storm that came over the bulkhead. We only had the damage-- The safest place in a storm in Wildwood is on the Boardwalk.

ASSEMBLYMAN GIBSON: It is a legitimate part of the real storm problem, and I am glad you brought it up.

I would ask the Army Engineers, maybe, to address that question. You said something about water quality is now part of your studies. See, if Wildwood has outflow lines, they should probably realize, and these are being buried by sand, and they have to periodically extend these outflow lines. Clearly, a result of increasing instead of an erosion, but the same problem. Are they eligible for aid on something like that?

MR. TUNNELL: They are eligible for 90/10.

ASSEMBLYMAN GIBSON: Maybe they are eligible for 90/10 since it was your good jetty that--

MR. TUNNELL: What has happened is, the Corps is not necessarily in the-- We can study water quality, but we can't implement it--

ASSEMBLYMAN GIBSON: Okay.

MR. TUNNELL: --because that causes us to then jump over into the EPA's jurisdiction. We are working with the State very closely to identify the sources of the water quality

problems. We are bringing our coastal expertise to bear to understand the hydrodynamics and flow regimes and so forth that exist for the contaminants that make it out of the back bay into the oceanfront and so forth. It gives the State folks a better understanding -- and EPA folks a better understanding of the sources of the problems we found. We are lending more of our (indiscernible) expertise in that arena than we are as far as construction.

ASSEMBLYMAN GIBSON: Well, could you consider that and give us a formal response as to what Federal aid may be available, or something like that?

MR. TUNNELL: From a water quality standpoint?

ASSEMBLYMAN GIBSON: No, from a construction standpoint, without the water quality, just because of the jetty that is there.

SENATOR CAFIERO: It is really an erosion problem. The erosion at Stone Harbor is--

MR. TUNNELL: Well, no one knows what the source of the erosion is, so, you know, quite frankly, a storm sewer outflow extension is not included in the formula. It has become a locally provided feature of the project. Ocean City's cost sharing formula, as well as Cape May's, requires, in accordance with Federal law, that this is an item of local cooperation, so they provide it, but they do get credit for it against their 25 percent.

ASSEMBLYMAN GIBSON: Okay, that's the answer. On Ocean City's project, the storm drains had to be--

MR. TUNNELL: Extended.

ASSEMBLYMAN GIBSON: --extended because of the sand you were pumping in there. How much aid did Ocean City get in the extension of those? Zero, but the money they spent, did that count toward their participation in the project? (no response). So they got more than zero then. They got something anyway.

Would you look into that for us, and see if there is something out there that the City of Wildwood might enjoy?

Anything else, Councilman?

COUNCILMAN LEMMA: Somebody suggested that we ought to color code our sand along our neighbors, and whatever color we get, tell them to come and get their sand, you know. (laughter)

All right, thank you.

ASSEMBLYMAN GIBSON: Sea Isle's is white. They'll be glad to have it all back, if you can get it to them.

ASSEMBLYMAN GAFFNEY: Mr. Chairman, the gentleman who has left now, from Cape May point, who was talking about the church 279 years ago that has moved inland-- I would imagine my comments earlier about Mother Nature-- It is highly possible that in 279 years Wildwood's beach will be normal and Ocean City will need a tram to get into the ocean, because it is not nice to fool with Mother Nature.

COUNCILMAN LEMMA: (speaking from audience at this point) Just one last thing: From our Boardwalk, our borderline has to be at least 1800 feet -- at least.

ASSEMBLYMAN GIBSON: Joseph Martin, Commissioner, Borough of Longport.

**C O M M I S S I O N E R   J O S E P H   A .   M A R T I N :** May I sit over here?

ASSEMBLYMAN GIBSON: Sure.

COMMISSIONER MARTIN: I would like to ask Ken Smith to come up with me.

ASSEMBLYMAN GIBSON: Bring in the heavyweight.

COMMISSIONER MARTIN: The reason I asked to come up here is because I would like to preface my remarks by paying Bernie Moore a very, very sincere compliment on the action he took to put a plan together that became an emergency situation at the point in Longport. It was predicted that we were going to have spring tides at the July full moon. I think we had a lot more than that, because the point washed out at the corner

that you see here. It is 11th Avenue, and the jetty going out to the beach; then the homes belong here (demonstrating). All these homes are protected by bulkheads. As the storm washed the bulkheads out, those property owners would be affected by that, and they would have to stand their own expense.

My main concern -- and I had a very difficult time getting this point across to the press -- was that we were not showing the people who lived in the point area who had those big, very fine homes that we were taking steps just to protect them. My concern was the scouring out of the point where the bulkhead met 11th Avenue. I think Bernie had to come down to the beach. I don't know who else you had with you, Bernie, because I can't remember all the names. A lot of people said the dredging they did over in Ocean City caused this. I am not here to discuss that. Our good friends in Ocean City got their beach back, and we are very happy about that.

When I was asked by New Jersey News where the beach went, I said, "Just call up Mother Nature and ask her." The point I am making is that unbeknownst to us, and through the efforts of Ken Moore -- Ken Smith, I'm sorry -- the Coastal Advocate, who came aboard about two weeks before this-- Is that right? (no response) My time frame-- I get lost with my time frame. The fact that I am new to government, I do not know all of these technicalities, who to ask, and where to go for money. It boils down that the project -- the estimate was \$400,000, which they would be looking to the Borough of Longport for \$100,000.

Our immediate reaction from the residents was, "Why should we help those people down there? They knew what was going to happen." They didn't know what was going to happen, but they claimed they did. So they do not want to pay that. We had discussed this, and we were to go out and look for other funds.

I met Senator Bradley on the beach when he was doing his Beach Walk, and I asked him to come up and look at this. He didn't have the time, but he said he was going to send one of his representatives back the next week. He has never shown up. I was in touch with Senator Lautenberg's Office, and they responded right away. In fact, right before I came over I talked to Liz O'Donohue (phonetic spelling) from Senator Lautenberg's Office. There is no-- All I am looking for is \$100,000. They are sending me some information on where I might apply for more grants.

Liz told me that there was no money at FEMA for this, so I have to address a question to FEMA, because now I understand that if it is an emergency, there could be funds available for a project that was declared an emergency by the Department of Environmental Protection Agency. Is that right, Bernie?

MR. MOORE: (speaking from audience; no microphone) Yes, but it is not eligible for FEMA funding because it was not declared an emergency by them. Okay? It has to be a natural disaster that affects the coastline or affects an area, and then a request is made to the Federal government for aid. This is a localized problem. It is not a major coastal event or a natural disaster which would precipitate a Federal involvement.

COMMISSIONER MARTIN: We all stand up here and say the government should give us funds. I have had a lot of criticism from -- not all the people in Longport, because when we passed a resolution to do this job, there were many people who stood up and applauded the governing body for having the courage to stand up and take this position.

I read an article in the press about, "U.S. Pushes Startup Funds for Palestinians." I am all for creating peace throughout the world. I served in WW II. I didn't have any of my boys go, and I don't want to see anyone else's boys go. But here is a guy down in Washington who out of a hat is going to

pull \$25 million for the United States to donate to help these guys get started. Get started doing what? I mean, that is where I think the pressure ought to go; to cut down on throwing money at the people in these countries who turn around and post signs -- after they get the money -- put signs up which say, "Yankee Go Home." I think that is the big problem. There is too much money being spent in Washington, where here is a little community like Longport-- I have to echo Mayor MacInnes' comments that they are a small community and they do not have a lot of ratables -- mercantile ratables.

We have Aussie's, a gas station, and a bankrupt restaurant. Everybody is not employed in Longport. I live on the north side. I think the Legislature should put some pressure on Washington to divert some of the funds that are going overseas over here, and get our problems straightened out. "Charity begins at home," is the old thing -- the old saying.

Longport, back in the late '70s or early '80s, built a 10- or 12-block seawall. At that time that was the last word. Today you do not do those things. We are looking to do something else to recapture that area.

Back in the early part of the century, Longport lost 10 blocks. I understand -- I wasn't here at the time -- that is what is now known as Ocean City Gardens. So maybe we can get Senator Gormley to don his green uniform again and we can invade the Longport Gardens and seize it back for Longport. I say that in jest.

So you see, there are a lot of communities which have real nice homes in them, but there are also nice people back there who are right up to their ever-loving with taxes. Any help we could get from other sources, we would appreciate, and I know Mayor MacInnes would appreciate, also.

A question to John Tunnell, and then I will get off: On the inlet, you are studying the coastal-- This is for the Army Engineers' person.

MR. TUNNELL: Right.

COMMISSIONER MARTIN: Oh, okay. Knowing that there were 10 blocks lost -- knowing now that there were 10 blocks lost -- from a storm, and at one time this was the lower island where the seawall was put back to prevent that, what studies are being done for this part -- for the Longport part of that?

MR. TUNNELL: (speaking from audience) We have a feasibility study underway from the New Jersey Shore Protection Fund, and the first reach of that, that (indiscernible) island area, we-- (remainder of sentence indiscernible; no microphone) We now are currently in the data collection phase. We will get into some real serious work next the next fiscal year. Our people will be in contact.

COMMISSIONER MARTIN: Okay. The Mayor asked me to be Project Coordinator for this particular one. He said, "Find the money."

Now, there is also a question -- or a suggestion was made by Tammy DiGiacomo and John Garofola of replenishing this beach from 11th Avenue up to 32nd. Knowing that there are houses built out there too far, they are saying now that putting the big rocks there and then starting dunes-- That would have to become a replenishment project. Could you address that?

MR. TUNNELL: They asked me to move up to the microphone.

We will look at any plausible solution to the problems as part of our feasibility study. So we will address structural measures, as well as beach fill. In the area of an inlet, beach fill doesn't always hold too well, so we are probably talking more of an armoring process that would solve your immediate problem. So I guess the plan that Bernie's folks have come up with is probably your best solution at this point.

COMMISSIONER MARTIN: Okay. Do you think extending the jetties out, or putting another jetty in this area--

MR. TUNNELL: I think we would have to look at that from the standpoint of the impacts of any structures, because, you know, all-- You can look up and down the coast and see the impacts of the little finger groins that have been constructed over the years. They all have, you know, a positive effect on the updrift side and a negative effect on the downdrift side.

COMMISSIONER MARTIN: Yes.

MR. TUNNELL: And when you are in inlets, they do other crazy things; like they become tidal current trainers and so forth, so as to divert flows into areas that you did not expect -- the conversion for when you are working in an inlet area to get into a real understanding of the impact of what you are trying to produce.

With all of our expertise over the years of building jetties at inlets, we caused the problem at Cape May City. We acknowledged that, you know, many years later. We had to come along and put in a very expensive beach fill project.

So you really need to get a true engineering understanding, and you are going to the right source in working with the DEP folks as to what the impacts would be of any type of structural solution at this point. We are many years away from any solution, so if you are looking for something immediate, I would say you are on the right track with Bernie.

ASSEMBLYMAN GAFFNEY: Mr. Martin, as Mr. Tunnell said -- through you, Mr. Chairman-- As Mr. Tunnell acknowledged earlier that politics occasionally does enter into this, and since you already contacted Senator Lautenberg and you are getting a response from there -- and I know you have been working through our office and through Senator Gormley's office--

COMMISSIONER MARTIN: Yes?

ASSEMBLYMAN GAFFNEY: --why don't we all try to work together through Senator Lautenberg's office, since the timing may be right since he is running for reelection next year? We might be able to get the \$100,000, or work on that point.

COMMISSIONER MARTIN: Okay.

ASSEMBLYMAN GIBSON: Thank you for bringing that to our attention.

KENNETH J. SMITH: Mr. Chairman, I signed up. Do you want me to come back later?

ASSEMBLYMAN GIBSON: Stay up here with us, Mr. Smith. We are glad to have you. I do have some others that I promised to call on. The administrator, Andy Bednarek, from Avalon, and his engineer. Did you want to share some things with us?

ANDREW J. BEDNAREK: (speaking from audience) I have some specific questions--

ASSEMBLYMAN GIBSON: Okay.

MR. BEDNAREK: I was sent on here by my Mayor, Martin Pagliughi.

ASSEMBLYMAN GIBSON: You have the distinction of being probably the only administrator of an engineered beach in the State of New Jersey. There are two engineered beaches, but I don't think the other municipality has an administrator, so welcome to our hearing.

MR. BEDNAREK: Thank you very much.

We are not here to do any check thumping, but what we wanted to do-- The Mayor has asked that I come before the Committee and thank you for the opportunity to spend a couple of minutes with you to acknowledge and reaffirm the fact that we do have engineered beaches in Avalon. It is not that difficult to do -- engineered beaches. We have had engineered beaches since, I believe, around 1985. We have a consulting agreement with Dr. Farrell, a professor at Stockton College. As a result of having engineered beaches, we can testify that we have been able to successfully obtain FEMA funding as a result of some of the storms we have had in the last -- since we have had the engineered beaches.

One of the points that Marty wanted me to bring to the Committee is possibly if you do consider some type of

legislation, that you may want to consider, in the distribution of funds out of the stable funding source for beach replenishment-- You may want to consider including that beaches are required -- shore towns are required -- to have this engineered beach as part of the statute. Then you might want to use some of those funds to offset some increased engineering costs or consulting costs out of that stable funding source to help municipalities out.

We are spending, I believe, \$8500 this year for the quarterly beach monitoring with Dr. Farrell. It's money, but it is not that expensive when you view it in terms of what you are eligible for if and when that storm event occurs, and we all know that it is going to happen. I mean, we have been pummelled over the last couple of years, not just Avalon, but up and down the coast.

So with that in mind, we put that on the table for you to consider. I think Bob might have a few points he wants to make. Bob Mainberger is our engineer with Killam Associates.

Thank you very much.

**R O B E R T M A I N B E R G E R:** I just have some specific questions I wanted to get involved with; one I know that, Jack, you are interested in. The reef project, just to give you an update, was completed around the 27th or the end of July. The area just now is stabilizing to the point where we are doing the initial monitoring with Dr. Bruno's group of Stevens Institute. So we really won't have any per se documentation on the effect of this or that until we get the stabilization results, know where we are, and then following a storm we can get a feel for what is going on. And of course, every storm is an individual event, which may push sand in different directions, so you are really looking at a long term. Any immediate, let's say, success that was gained by one particular storm, you really don't want to jump on that because you are looking at a 18- or 20-month monitoring period. A storm with a

rip in the opposite direction could, say, you know, that it doesn't work, or one could say that it does. So you really have to be very careful in that assessment.

A couple of quick questions I wanted to try to clarify. One, I would like to talk to the FEMA representative, because, as you are aware, I mean, it is very important to try to establish what is required. You are going to find that most of the requirements for an engineered beach came out of memorandum which was handed down in 1984 from Samuel Speck, who was the Regional Director at the time. That should be something that all of you should get your hands on. It is dated May 9, 1984. That was a memorandum that came down to -- he was the Associate Director at the time -- all the regional directors.

I also have a question regarding FEMA -- to Mr. Galinis: As you are aware, the 1992 FEMA regulations, Section 44, Chapter 1, have the very specific detailing of due requirements, which has become a major issue as far as the square footage, cross section -- which is 540 square feet -- or the dune cresting above the still water 100-year storm flood elevation. That has been indicated as maybe becoming a criteria for any shore or landward side reimbursement, or hazard mapping, or for firm mapping and future insurance.

Is that going to become a specific requirement in the near future?

MR. GALINIS: (speaking from audience; no microphone)  
I am on the Disaster Assistance Program. What you are referring to, sir, is our Natural Technological Hazards Division. We administer the Flood Insurance Program. I can refer to you a name and a number after this meeting you may refer to on that.

MR. MAINBERGER: Okay. So you don't know if that is going to become--

MR. GALINIS: I will not speak to you on that.

MR. MAINBERGER: Okay.

ASSEMBLYMAN GIBSON: We would be interested in hearing a response on that, too.

MR. MAINBERGER: Right, because there has been some moving around on this. Maybe Mr. Moore could shed a little light on this, that another state is working in that same direction. They have a new growth market, I think. Mr. Moore, is there anything else that is going to work on that dune cross section situation?

MR. MOORE: (speaking from audience) Well, the dune cross section is with regards to the National Flood Insurance Program. One of the criteria that is being suggested, and we endorsed, is that we restudy the coastline with regard to the dunes and the runoff in the velocity zones within that area. That study has started. I do not believe that criteria has been established to date. It will probably be several years before it gets to that point of the hard and fast rule.

MR. MAINBERGER: That is an understatement.

MR. MOORE: That's an understatement, but the State implements and follows the policy guidelines that FEMA establishes.

MR. MAINBERGER: The FEMA criteria is there as far as any--

MR. MOORE: Yes. They are also going to have to restudy the areas and proceed if that is practical. This was discussed at a meeting we had up on Long Beach Island.

MR. MAINBERGER: Okay. I would be interested in that.

I'm sorry to bother you again, Bernie, but you are also helping NJDEP in ranking some of the hazardous mitigation grant programs from the -- grant applications from the last disaster, along with FEMA and the Emergency Management Group of the State Police. Do you know if the rankings of those grant applications that haven't been kicked out yet have been completed and when they will be approved?

MR. MOORE: Rankings are still going on. The rankings are being adjusted because the amount of funds that are available for litigation have been aggressively reduced, because of the amount of money that has been approved by FEMA for storms. Initially when a storm hit and everyone was out there doing their thing, it was anticipated that the cost of the storm would be well over \$100 million, which pays 10 percent, or \$10 million is available for litigation. That was in error. The information that was passed out and delivered was wrong. The amount of money is somewhere, probably around \$3 million -- or somewhere in that category.

So problems that had been approved now have to be relooked at and reran.

MR. MAINBERGER: Is that \$3 million on the Federal side and \$3 million matching which would come out of the local side, or is that \$3 million total, \$1.5--

MR. MOORE: That's \$3 million total.

MR. MAINBERGER: Total, okay.

MR. MOORE: We have-- The State does have approval for ranking. It is not just all DEP.

MR. MAINBERGER: Right.

MR. MOORE: There are other key people from DOT and Community Affairs and other expertise units that are, you know, participating.

MR. MAINBERGER: Okay. Thanks.

I just have one other question, because I know we are talking about sources of sand for this renourishment. Certainly, Avalon, Sea Isle City, and other places have an advantage if they can get sand readily from an inlet or something of that nature, where it is secreting or it needs to be removed or there is a maintenance project going by.

Getting back more toward the Army Corps of Engineers, in the northern section of New Jersey where you have a long stretch and you don't have an inlet and you are looking for

borrowing sand oceanside, has the Army Corps of Engineers identified specific sites for their own purposes past the Manasquan Inlet from the New York side, and from the Philadelphia side up to the Manasquan Inlet, so that private entities or municipal governments could utilize the Army Corps of Engineers' borrow zones to end their study work, to include in their applications for renourishment?

MR. PFEIFER: (speaking from audience; no microphone) Okay. We have identified borrow areas that needed projects. In doing the exploration, you find areas with suitable sand and areas where the sand quality is not as good. But we pick out an area that we feel is of sufficient quality and quantity to nourish the -- to build the beach and to renourish the beach for the fifth-year period. It is in that area that we have data information. There are areas that the State would like to use, you know, that are not necessarily under our jurisdiction. The land is there under the water. I am sure the State could use our information and then designate its own areas -- the municipalities.

MR. MAINBERGER: Or a municipality, because-- Oceanside Borough's own site analysis is a very expensive proposition.

MR. PFEIFER: It is. So long as it doesn't encroach on the areas designated for the Federal project, I don't think--

MR. MAINBERGER: Do you know exactly how far you overlap -- Oceanside south of Manasquan -- and whether the Philadelphia District may need to help you? Have you identified sites up to that point?

MR. TUNNELL: (speaking from audience; no microphone) We, too, have identified sites through the study process and through the construction and engineering process. Similar situations were found, saying as long as there is no encroachment on the areas that are identified (several words indiscernible) through all the information out there.

Our New Jersey Shore Protection Study will document some of that. There is actually a section in the '92 water resources bill that dealt with information gathered at the local--

UNIDENTIFIED SPEAKER FROM AUDIENCE: I'll have to look that up.

MR. TUNNELL: I don't think it was ever funded, but there was some legislative direction that was set in that bill. It just hasn't been funded. It would cover local communities applying on locations under that bill.

MR. MAINBERGER: Fine. I am sure that kind of cost-- Would that be limited at the three-mile limit? Everything you would do would be inside of that, or--

MR. TUNNELL: We don't limit ourselves except for the costs involved.

MR. MAINBERGER: Okay. That's all I have.

ASSEMBLYMAN GIBSON: Stay there a second. I have a question that has been developing during the morning. I had thought, at the beginning of this hearing, that an engineered beach was simply engineering, not so much construction. But it seems like some of the municipalities are concerned that they don't have the money to have an engineered beach. They think they have to make an investment. They have to build up a berm and spend that money and bring outside sand in to build up that berm. In many cases, that is probably true.

In Avalon's case -- and you may not go all the way back to the beginning; Ken Smith can jump in, or anybody can answer this for me-- In Avalon's case, when they first started to measure Avalon, for the most part a great deal of Avalon's beach was a magnificent beach, already there. It really didn't, in my opinion, need any additional sand. Now that it is done it is eligible, but it seems like somewhere along staff we have seen some memos or some advice that you have to bring a different sand in.

If, in fact, the town -- and, you know, somebody can answer-- If, in fact, the town has their engineer, measures it, shows that it has the volume and the profile and everything it needs to last for five years, or more, but it didn't do anything, it was just there-- They knew it; they measured it; it doesn't need to be adjusted. It's there. Now they get a storm, they lose it, the President declares a disaster, and they are not eligible for Federal reimbursement because they physically didn't do anything.

Is it true that they wouldn't get Federal reimbursement to replace the sand they lost, that nature put there, but they measured, and they documented, and they--

MR. PFEIFER: The criteria is to maintain the beach to the profile that has been established.

ASSEMBLYMAN GIBSON: Or greater?

MR. PFEIFER: Or greater. But you have to at least-- Once you set your criteria and your profile, you have to maintain it to that profile.

ASSEMBLYMAN GIBSON: Okay.

MR. PFEIFER: That is at the barest minimum.

ASSEMBLYMAN GIBSON: Then let's say they have set the beach to the profile and the sand is above that profile. The five-year storm, the engineers say, and everybody agrees with them -- the five-year storm -- there is more than enough sand there. The profile is actually below the physical natural level that is there. Now they lose it, but they didn't do anything, just left it above this profile.

Will the Federal government, if a disaster is declared, pay them to replace that?

MR. PFEIFER: If I understand your question, sir, they are above-- After the storm they are still above the--

ASSEMBLYMAN GIBSON: No, before the storm. Before the storm, but after the--

MR. PFEIFER: But they have--

ASSEMBLYMAN GIBSON: They measured it.

MR. PFEIFER: The storm created damage to the beach, but they are still at the five-year storm level?

MR. SMITH: No. Suppose you have a 100-foot wide beach, a nice optimal beach width. Maybe this is the problem.

ASSEMBLYMAN GIBSON: Yes, it is--

MR. SMITH: I know where you are headed, Jack. We are a community that fortunately has some stability to its beach. You designed and engineered it, whether you had to or not. You have been lucky. You haven't had any problem on that beach where down just below the beaches had problems. The big one hits, and all of a sudden that beach is taken out. What once was a viable, healthy beach that did not need renourishment at the minimum five-year interval -- okay? -- now is looking for FEMA to reimburse them. And FEMA says, "Well, that is a natural beach. It doesn't qualify because you haven't renourished it." What if they didn't have to renourish it?

MR. PFEIFER: Does the town have the documentation and profiles or studies or whatever over the five years to justify their not needing to renourish that beach?

ASSEMBLYMAN GIBSON: Yes, in the hypothetical case.

MR. PFEIFER: If they have that documentation, hypothetically, they should be eligible at that point. But if they do not have that type of documentation to support that there was no need to do something after an event, whether declared or not, they are going to run into a problem. It's the documentation.

MR. SMITH: So there should also be some type of a written commitment that we are going to defend this profile, if we need to. If we don't, then-- See, that is where the five-year renourishment-- That's been a problem.

ASSEMBLYMAN GIBSON: That is what some of us in the Legislature have been talking about. We think there are municipalities out there that only need some engineering; only need some information; only need some guidance; do not really

need the physical construction dollars. Then if a storm hits, that minimal cost will make them eligible for these Federal reimbursements. We think there may be a lot of municipalities out there like that. Maybe we're wrong, but if there are we want to find them. In fact, I introduced legislation Monday that aims at trying to get to that point. There are plenty of opportunities for this, I believe. Senator Cafiero mentioned this sometime back at one of his hearings.

SENATOR CAFIERO: At one of the meetings of the Committee that Senator Kyrillos held-- Scott Weiner was there, and I said, "It would be so nice if somebody could get two little handy books, or handy-dandy home do-it-yourself guides for municipalities that say: 'What do we have to do to get an engineered beach? What are the most effective ways to maintain the beach?'" whether it is Christmas trees or rubber tires, whatever it is, so that towns with 500 people, or 10 feet of beach, don't spend a lot of money to get what is already in the minds of the experts. The bill that Jack just put in is going to get these people, hopefully, to get to the engineered level, and maybe many, many beaches that but for want of the engineering expense have engineered beaches, and had they had that information when the storm hit, they would have known what they lost and would have qualified. So maybe we are heading in the right direction.

MR. SMITH: Mr. Chairman, if I may, through you, I just want to address Senator Cafiero's comment. The problem is with many communities that they basically just want to do beach scraping, maintenance of dunes, some profiles, and they feel that that is sufficient to qualify them under FEMA. There are not a lot of communities that have that optimal beach that you are talking about. What happens is, they get caught.

Manasquan, at the last Commission meeting, complained that they did not understand what the criteria was. Unfortunately, and it's a question of dollars, communities are

looking at the least expensive way to provide the protection. But you have to look at that beach as a sand-sharing system, and the profiles are critical to this, because you have to know what is going on offshore also; what the flow for that beach is. There is a lot more to it than just beach scraping. In fact, one of the points that FEMA makes is that beach scraping, by itself, does not qualify a community, because all you are doing is shifting the existing sand around. You are not necessarily maintaining an optimal profile -- a designed engineered profile.

MR. MAINBERGER: Just a quick addition: I know you are talking engineered beach, engineered beach. FEMA criteria is not just engineered beach, but it is improved beach. They specifically indicate in their guidelines that if it is a natural beach, it doesn't count. So you just can't go out there and say -- and have a natural beach and say -- get your engineer to go out there and say, "Oh, this is perfect. This is our engineered beach." They are not going to come through for you. You are going to have to lose it; you are going to have to rebuild it, build it to an engineering condition, and from that point to maintain it to get into that system. And you are going to have to do the studies before that, tell them what you expect to lose. You have to put into place the ordinances, in your budget how much you are going to do, and adopt a maintenance program. There is a very specific list that FEMA gives in these directives that came down to the directors -- these memos that you want to look at. Also, you know, the different sections of Chapter 44 of the FEMA regulations, which talk about requirements for a beach and where you are eligible and where you are not.

I know you're saying, "Can't we just go up and down and if it is a good one, let's say it is ours, have our engineer certify it, and that's it." Right now, that doesn't cut the cake with FEMA, according to the regulations.

SENATOR CAFIERO: Mr. Chairman, what I am saying is-- You've got to build it, they won't fix it, is that what you're saying?

ASSEMBLYMAN GIBSON: That is what it is coming back to, unfortunately.

SENATOR CAFIERO: Well then maybe we ought to memorialize Congress to change that regulation into some towns fortunate enough to have a beach to qualify for the engineered standards from the profile, will double qualify if they do that. I don't see any justification to say, "Well, we don't want to replenish because God built it first." That doesn't make sense.

ASSEMBLYMAN GIBSON: It's like--

MR. MAINBERGER: I think, people, it came to the point that when you are in a situation where God is building and building and building it, you are not after to fix it, because if it is not broken, you are not looking to fix it. Now that you are seeing a lot-- See, things are changing now. You are not getting that natural sand resource coming to the shore, because a lot of inlet areas are stabilized; a lot of rivers are stabilized; the sand isn't washing down. It is not continually refeeding these areas with sand, so some areas are just getting stripped away. That is why you are looking at these renourishment programs now.

SENATOR CAFIERO: I think there is something wrong with that logic. You said with the cost picture. Your cost figures are up. You got something as a gift. You didn't lose anything, because somebody gave it to you for nothing. That doesn't make any sense. If it has value, it has value whether it got there by your efforts or heaven sent or nature or whatever it is.

MR. MAINBERGER: Well, that's true.

SENATOR CAFIERO: So maybe we ought to memorialize Congress to--

MR. MAINBERGER: That is more in a political pursuit than--

ASSEMBLYMAN GIBSON: You are not setting the criteria; you are just interpreting the criteria.

MR. MAINBERGER: No. We're just saying if you look at the criteria that we have seen, because we have had this argument with FEMA in that line.

ASSEMBLYMAN GIBSON: Well, we want to take a look at that.

All right. Thanks, Bob.

ASSEMBLYMAN GAFFNEY: Mr. Chairman, through you, Mr. Markowski, do you have anything to add to this from Margate?

COMM. THOMAS S. MARKOWSKI, JR.: Yes, I would like to make a statement.

ASSEMBLYMAN GAFFNEY: Come on up, sir.

COMMISSIONER MARKOWSKI: My name is Tom Markowski. I am Commissioner of Public Works in Margate, New Jersey. The subject that has just come up at this particular point in your questions from two or three of you people, is very germane to our particular situation.

In Margate, we have had a relatively little problem through the years with beach -- with loss of beach. We would accrete some, we would lose some, but it stayed relatively stable, to my eyes. I have been a resident of the city for 35 years. I don't know whether the Army Corps of Engineers or FEMA will agree or disagree with that point. I have been a resident, lived there, used the beach. We have lost very little. We have gained a little. There has been relatively little change.

The storms of October, December, and March actually killed us. We spent \$80,000 after the October storm rearranging the beach, not just scraping it. Our beach builds up along the bulkheads. The residents complain. The sand blows into the street and blows onto their expensive lawns. We

move it away. We put it back where it was, so to speak. It cost us \$80,000 to rearrange it after the October storm. We had built dunes with city money; we planted grass on two different occasions. Unfortunately, that preceded the two storms. The storms totally washed it away.

I have been in contact with the Office of DEP and the Office of Emergency Management at the State level, trying to get the specifics of what is an engineered beach. Following the October storm, we applied for Federal funds and were told that we didn't have an engineered beach, and we were not subject to it. December came along, another heavy storm, the same response. I charged right out trying to find out what we had to do to obtain an engineered beach. I was told there were going to be a couple of meetings, which apparently did not occur. I attended a meeting, together with the Mayor and fellow Commissioners and our City Engineer, in February in Long Branch, where there was great discussion. Dr. Stuart--

UNIDENTIFIED SPEAKER FROM AUDIENCE: Farrell.

COMMISSIONER MARKOWSKI: --Farrell was there also. I applied for and I asked for help in finding out how we, the City of Margate, could qualify as an engineered beach. I still have not been given a particular response. I was told last month that there would be some future meeting that municipalities would be invited to and those specifics would be made available. Unfortunately, I walked into this meeting late this morning. I am told that there was some basic information given at the beginning of the meeting about what was an engineered beach. But I felt, Senator Cafiero, as you pointed out, that we may have met that criteria of being an engineered beach without having the "designation" of being in that particular position. I am endeavoring to find out what we have to do to qualify so that we can have Federal funds available if and when this particular problem happens again.

ASSEMBLYMAN GIBSON: So far we have learned that you certainly have to measure it. You have engineers there and you have to have a maintenance program. It does sound like you have to have had spent some money to replace it at one point in time. That last part we are not satisfied with -- some of us aren't.

He is on the Atlantic City island.

MR. TUNNELL: Yes, Absecon island.

ASSEMBLYMAN GIBSON: Is he part of an Army Corps of Engineers' project? (no response) You may be in better shape-- Do you want to address that?

MR. TUNNELL: (speaking from audience) You are part of the Brigantine study, the study that is underway.

ASSEMBLYMAN GIBSON: Oh, the study. Didn't the Army Corps pump sand into Atlantic City several times?

MR. TUNNELL: Yes. That has been deauthorized. That is an old project from--

ASSEMBLYMAN GIBSON: They didn't enjoy the 50-year--

MR. TUNNELL: Back then it was only 10.

ASSEMBLYMAN GIBSON: --maintenance guarantee that we get now. Okay.

Commissioner Markowski, You are as interested as we are in--

COMMISSIONER MARKOWSKI: Absolutely.

ASSEMBLYMAN GIBSON: --continuing to try to establish for Margate an engineered beach, together with your engineering people. It may be, at least at this point, that there has to be some physical maintenance work done there to be eligible. Then there has to be a storm, a declaration, and so on. We hope that all of these things do not take place, but that's kind of the--

COMMISSIONER MARKOWSKI: It is inevitable.

ASSEMBLYMAN GIBSON: This, that, or it's now. The Army Engineers are studying your island and if, in fact, you are eligible for a project, then you not only get sand, you get

a nice beach, but they guarantee it and maintain it for the next 50 years. Maybe we are all going in that direction. It is not going to happen for awhile, but hopefully it is going to happen.

ASSEMBLYMAN GAFFNEY: Through you, Mr. Chairman, can Commissioner Markowski get some satisfaction before he leaves the building today?

MR. MOORE: I'll talk to him.

COMMISSIONER MARKOWSKI: Thank you very much. Thank you, Assemblyman.

ASSEMBLYMAN GIBSON: Bob Roman, Mayor of Mantoloking.

M A Y O R R O B E R T A. R O M A N: I would like to thank the Chair and this Commission for holding these public hearings, and especially today having the Army Corps of Engineers, along with FEMA, here. I think it is very important.

Our town, for 12 years, had a fantastic dune program. We went along just swell until the winter storms hit. In fact, in 1991, our town was nationally recognized for our dune program. Well, after the storm, of course, our dunes were decimated and our beaches were reduced greatly.

At this point, we are looking to get into the big boys' game in looking at this managed beach program. We have learned an awful lot since the winter storms. We have an awful lot more to learn. Many people who were here today have been of great help to us.

I do have a question for the Army Corps of Engineers. I feel like a stepchild this morning. No one has really mentioned the reach from Point Pleasant Beach to Seaside. Is there anything being considered for that area?

MR. TUNNELL: That is a part of the New Jersey Shore Study. It has not been started, but it has been identified as one of the future study areas.

ASSEMBLYMAN GIBSON: It's authorized.

MR. TUNNELL: For study.

ASSEMBLYMAN GIBSON: Okay.

MAYOR ROMAN: From where you sit, if everything goes well, when do you think something could be done if the study is approved?

MR. TUNNELL: Well, the study has been approved. It just hasn't been funded for the reconnaissance phase. It all depends on the funds New Jersey has and when we can get started. Well, we could start anytime, but we don't want to jump start the funding mechanism.

MR. SMITH: Mr. Chairman, I have a question for John, just a quick one: If New Jersey were to secure the Federal funding for the recon phase of that, is your District ready to go? Would you be ready to mobilize the next step?

MR. TUNNELL: We could go tomorrow.

MAYOR ROMAN: Is this a case then of--

MR. SMITH: We go to Washington every year--

MAYOR ROMAN: Yes.

MR. SMITH: --to the Maritime Advisory Council -- Bernie is with that -- and request certain appropriations for coastal projects. Long Beach Island, this year, was in the loop for the 100 percent first reconnaissance phase study. Really, my question was: Do you have the capacity and the sources there that can mobilize for that type of study, because you are looking at five to seven years before you put a grain of sand on the beach. So we would like to get you in that loop as soon as we can.

MAYOR ROMAN: Do you think we are talking about anywhere between 1997 and the year 2000, for something being done?

MR. SMITH: For a timetable on that I would defer to John. I mean, it wouldn't be in before '95 -- FY '95.

MR. TUNNELL: No, the earliest we could be in would be FY '95. It is feasible assuming funding mechanisms are in place in New Jersey respective -- but obviously we will not start a study if New Jersey cannot follow through, because it would lead to disaster. If we start and stop--

MAYOR ROMAN: Right.

MR. TUNNELL: --there is no way to get back into the game, so we should make sure that the funding mechanism is there. I can foresee it as a possibility definitely to start.

ASSEMBLYMAN GIBSON: That is one of the biggest benefits of this permanent source of beach funding the State now has on an annual basis; that we can set a long-range planning to match Federal aid that is available. I do see, from what staff has prepared for us, that part of the first expenditure are these studies. We have committed, you know, a big share to these studies, and although we would certainly like to see beaches built, we've got to do this planning to be eligible for this. And, do we have the funds?

MR. TUNNELL: Yes.

ASSEMBLYMAN GIBSON: Okay. So you are going to get your study.

MAYOR ROMAN: Fine.

The next thing I would like to ask is: I understand that FEMA has a handout today with the game rules of what you have to do for a managed beach.

ASSEMBLYMAN GIBSON: Do we have enough for--

MR. GALINIS: Yes, we do.

MAYOR ROMAN: I was wondering: Does the Army Corps of Engineers have anything we can also have that has their list of criteria on any of the programs that they have?

ASSEMBLYMAN GIBSON: The criteria for the Army Corps would be to be eligible for a study -- you are going to get a study -- and then once that study is completed, if, in fact, the study is feasible, they will be ready. We have to then have the money, and it would be a matter of priority up and down the coast. That part of your question, I think, is a couple of years away toward answering.

MAYOR ROMAN: Okay, fine. Thank you very much.

UNIDENTIFIED SPEAKER FROM AUDIENCE: How about the FEMA study -- the handout for today?

ASSEMBLYMAN GIBSON: Well, you can have that today, yes.

Does anyone else want to speak? Yes, sir, Andy?

MR. PREVITI: My name is Andy Previti. I spoke to you earlier.

There are a couple of things that I wanted to bring up. One, I wanted to ask John Tunnell if Ludlam Island is included for a reconnaissance and feasibility study?

MR. TUNNELL: It's targeted.

MR. PREVITI: Do you have an idea of the time frame?

MR. TUNNELL: Probably sometime after '95.

MR. PREVITI: Has it been funded?

MR. TUNNELL: I can secure the Federal funds after that period.

MR. PREVITI: Because I think that Island is the only one that--

ASSEMBLYMAN GIBSON: And we have the State funds.

MR. PREVITI: --is not included in the program.

MR. TUNNELL: All the locations are-- Let me get it clear. The entire Jersey coast is covered under the study authority and produced in various phases of getting into that process.

MR. PREVITI: Right.

MR. TUNNELL: So it is not a question of having to go out and get the authority. It is a question of us bringing it into the Federal budget when New Jersey is ready to go.

MR. PREVITI: The other comment I would like to make is: I heard earlier from speakers that -- or I got the impression that they felt that FEMA was an agency to help them build their beaches, and that's really not what they are. Their name is Emergency Management, and they only respond to emergencies.

If we are looking for some type of program similar to how we rebuild roads, then we have to look at the Federal

government, possibly the Army Corps of Engineers, and the State setting up a program similar to the Municipal Aid Road Program; that there would be a constant source of money, and there would be a constant program to give this money to municipalities to do what they had to do with their beaches.

I will give you two examples that relate to Sea Isle City: In 1986, we had plans -- specifications prepared, sent to Bernie's office, following a recommended plan that the Corps of Engineers recommended in '66 after the '62 storm. Those groins were to be built following that plan. The plan languished in Trenton because there were no funds to come up with the 20 -- or 75 percent State share to build the structures. So Sea Isle City again decided, you know, "We can't wait. We have to do this." They funded it themselves, and that kind of community -- as Assemblyman Gibson well knows -- took the bull by the horns, and they got it done.

The groins were built. We put in our own beach fill. But, as I said earlier, they cannot continue to do this over time. There has to be a much better program to just organize things and to fund it. If you patterned it after the Federal, State, municipal program for road maintenance and reconstruction, that might be a good basis to go forward with some kind of better plan than we have now.

One other thing I would like to mention -- that Administrator Bednarek from Avalon mentioned -- about requiring in any legislation the State does -- requirements for an engineered beach. If you are going to do that, I would only ask you to be much more specific in the statute than the Federal statute. The Federal statute is very vague. The regulations got clearer after Hurricane Gloria in '85, and I think today it is a lot easier to understand what an engineered beach is in relation to how FEMA defines it.

But if you are going to require municipalities to have engineered beaches, I would ask you to make it very clear in the legislation, describing what the qualifications are so that

it is easy to follow what the qualifications are. Fortunately for me, I have been working with FEMA since 1977 -- Hurricane Belle, I think it was. But it took a good number of years to understand what to do. Finally, after '85-- I think Avalon was in the same boat. We have a good working relationship with them because we share Townsends Inlet and we pump sand out of that usually under joint projects. It has taken that long, say from '85 until now, to understand what the requirements are and to convince the municipality that, "This is what you have to do, and you are going to have to spend some money up front to do it." Fortunately, we are both in a position where we do have at least portions of our beaches engineered beaches.

The other thing I would like to mention is the term "natural beach" and how it relates to communities such as Sea Isle City and Avalon. Avalon has a big dune system. It is considered natural dune. I don't believe any work has ever been done to it. If a big storm hits and damages that, I don't believe they are eligible for any kind of reimbursement or assistance from FEMA. Is that correct?

MR. GALINIS: If there is improved property behind that--

MR. PREVITI: Well, it would be open for emergency.

MR. GALINIS: Emergency.

MR. PREVITI: Yes, that's all. Emergency berm is very minimal structure. It's there for a five-year design storm to withstand that storm.

Another great point -- and I am sure Ms. Burgess, if she is still here -- she has left -- is the north end of Sea Isle City. The north end of Sea Isle City is considered a natural beach. I think it was pumped in by the Corps at the '62 storm. It has not been maintained, so it has reverted to more or less a natural beach designation. We don't qualify for any kind of permanent assistance there. All we qualify for is emergency, which, again, is just a five-year berm.

As part of the DSR procedure after a storm, there is a program for hazard mitigation. They will work with us to see if we can do something to prevent the storms from causing the same kind of damage in the future. For the north end of Sea Isle, a hazard mitigation report was done. It was sent to the State, I believe. I received a copy of the response, and it is not cost-effective to do anything permanent in the north end of Sea Isle City.

So, while one section of Sea Isle is considered an engineered beach, the north end, which is very vulnerable today to anything-- A good northeaster is going to blow out the sand that's there and wash it over the road again. There is nothing that FEMA can do to help us with that, and that is where we really need assistance from Federal, Corps of Engineers, the State of New Jersey, to address those problems. I know the Assemblyman is aware of it because we have both gotten sand in our shoes walking along that area.

Thank you for listening to me. I hope you will continue your efforts. Assemblyman Gibson being a professional engineer, I think he is aware of all the problems we have to deal with along the coast, and being a resident of Sea Isle City, I am sure has a lot of experience with that problem. I hope your role in this will continue to be as beneficial to our community as it has in the past.

Thank you.

ASSEMBLYMAN GIBSON: Thank you.

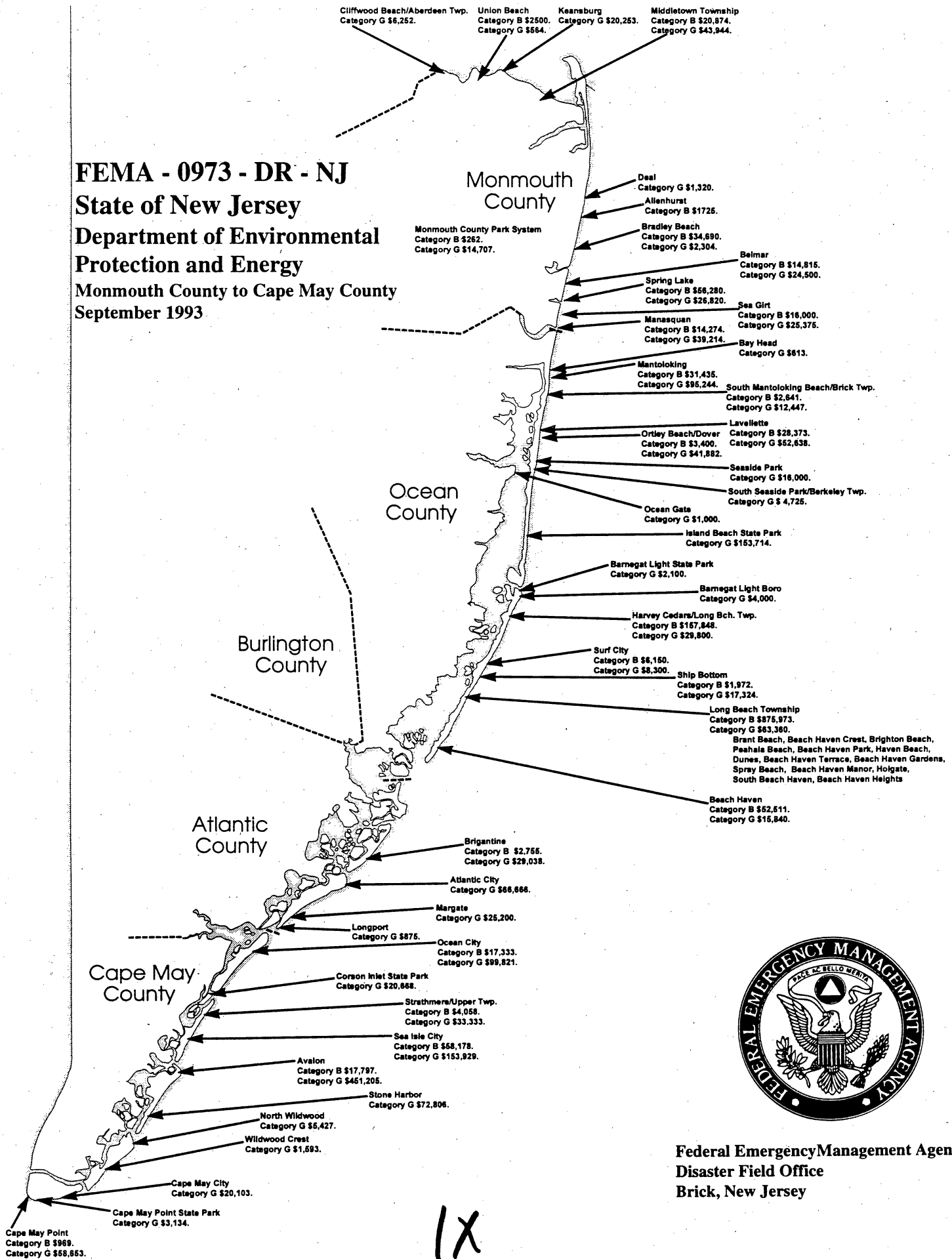
Anyone else? (no response)

I want to thank everybody for coming, the legislators and the staff. We thank the City of Ocean City for hosting the room, and the Army Engineers and the State personnel and the FEMA personnel. Thank you all.

**(HEARING CONCLUDED)**

APPENDIX

**FEMA - 0973 - DR - NJ**  
**State of New Jersey**  
**Department of Environmental**  
**Protection and Energy**  
**Monmouth County to Cape May County**  
**September 1993**



**Federal Emergency Management Agency**  
**Disaster Field Office**  
**Brick, New Jersey**

### FEMA EMERGENCY WORK

Emergency work is eligible for assistance when it is necessary to:

Eliminate immediate threats to life, public health, and safety; and,

Eliminate an immediate hazard that threatens additional damage to or destruction of improved public or private property.

Emergency work is limited to the essential measures required to protect against a similar disaster expected to occur not less frequently than every five years, or to restore protection as existed prior to the disaster whichever is lesser.

Emergency work must provide benefits to the community at large, and must have a favorable benefit-to-cost ratio.

### FEMA PERMANENT WORK

FEMA provides grants for the repair, restoration, reconstruction, or replacement of eligible public and private non-profit facilities on the basis of the design of the facilities as they existed immediately prior to the disaster.

Permanent work to restore or replace a natural beach is not eligible for FEMA assistance. A beach is considered an eligible facility only when that beach has been improved and regularly maintained prior to the disaster.

### EMERGENCY WORK ON BEACHES

Emergency work on beaches is typically the construction of a sand berm designed to protect the landward areas from a storm producing a 5-year recurrence interval tide.

This sacrificial berm is intended to provide protection from immediate threats of damage, and to allow for the repair, reinforcement, and/or relocation of improved property.

### PERMANENT WORK ON BEACHES

Replacement of sand on an unimproved natural beach is not eligible.

Work on an improved beach may be eligible under the following conditions.

- (1) the beach was constructed by the placement of sand (of proper grain size) to a designed elevation, width, and slope; and
- (2) a maintenance program involving periodic renourishment of sand must have been established and adhered to by the applicant.

#### DOCUMENTATION FOR IMPROVED BEACH ELIGIBILITY

For each nourishment and subsequent renourishment, the following should be provided:

- \* Design Study (Compatibility Analyses, Projected Life, etc.)
- \* Plans, Profiles, and Specifications
- \* Contract Documents
- \* As-Built Plans with Final Quantities and Cost

Documentation should also be provided to demonstrate that a "maintenance program involving periodic renourishment of sand" has been "established and adhered to by the applicant." This can include ordinances or resolutions committing to renourishment after a specified time period or when a specified percentage of the previous nourishment is lost. Mechanisms for initiating and funding future renourishments should be identified.

## Beach Nourishment Project Criteria

The Federal Emergency Management Agency (FEMA) does not provide detailed criteria defining a beach nourishment project eligible for permanent work funds under Public Assistance, because FEMA's function is to administer grants for the repair of existing, damaged public projects; it does not provide guidance on the design of public projects. Section 206.226 of the Code of Federal Regulations, Part 44<sup>1</sup>, describes an eligible improved beach as:

- (i) The beach was constructed by the placement of sand (of proper grain size) to a designed elevation, width, and slope; and
- (ii) A maintenance program involving periodic renourishment of sand must have been established and adhered to by the applicant.

These criteria were established to assure that eligible beach nourishment projects would be designed, constructed, and maintained as designed in the same manner as any other permanent public project.

FEMA's eligibility criteria for permanent work on beaches were based on criteria taken from a review of U.S. Army Corps of Engineers (USACE) beach nourishment projects. Although elements of the designs differ, many basic concepts are consistent in the USACE projects. Many of these elements are detailed in Chapter 5 of the Shore Protection Manual<sup>2</sup>. This USACE publication states that at a minimum, a beach nourishment project must consider the following:

- Determination of the long-shore transport characteristics of the project site and deficiency of material supply (average annual erosion);
- Determination of the composite sand characteristics;
- Evaluation and selection of source of material for nourishment and all future renourishments, including considerations for overfill due to different material characteristics and advanced nourishment;
- Determination of beach berm and dune elevations and widths based on design level of protection, average annual erosion, and renourishment schedule;
- Determination of wave adjusted foreshore slopes;
- Determination of and compensation for beach nourishment transitions such as initial profile adjustments, end losses, and expected erosion until renourishment; and
- Determination of renourishment needs and requirements.

One item not discussed in detail in the 1984 Shore Protection Manual is the need for subaqueous beach nourishment. Dr. James R. Houston, Chief, Coastal Engineering Research Center, USACE, Waterways Experiment Station, has in several recent publications<sup>3,4,5</sup> stated that projects where the subaqueous portions of the beach profile are not nourished, and where maintenance renourishment is not planned, should not be considered adequately designed beach nourishment projects - they can only be considered emergency projects.

Currently, FEMA and the USACE are participating in a National Research Council study on beach nourishment. The appointed committee of leading national experts will define the criteria for proper beach nourishment projects and will comment on FEMA's eligibility criteria for Public Assistance funds. This study is scheduled for completion in May 1994. Until that time, if criteria for a beach nourishment project more detailed than provided by FEMA are required, the criteria provided in the Shore Protection Manual and subsequent publications should be utilized.

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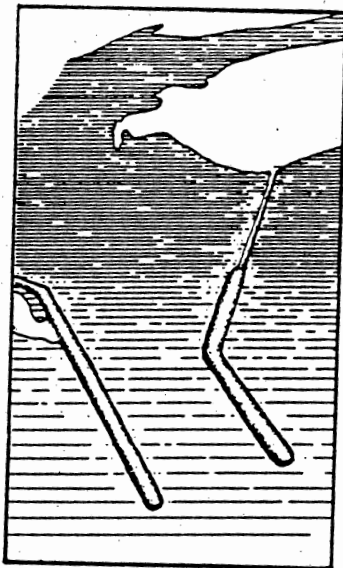


# SHORE PROTECTION MANUAL

VOLUME I

Coastal Engineering Research Center

DEPARTMENT OF THE ARMY  
Waterways Experiment Station, Corps of Engineers  
PO Box 631  
Vicksburg, Mississippi 39180



1984

Approved For Public Release; Distribution Unlimited



Prepared for

DEPARTMENT OF THE ARMY  
US Army Corps of Engineers  
Washington, DC 20314

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Nearshore slopes are usually gentle seaward of the bar. Slopes are steeper inshore of the bar and may be as steep as 1 on 5 at the waterline with coarse sand. Analyses of profiles at eroding beaches indicate that it may be assumed that the slope seaward of a depth of 8 meters (26 feet) will remain nearly unchanged, that the point of slope break E will remain at about the same elevation, and that the profile shoreward of the point of break in slope will remain nearly unchanged. Thus, the ultimate depth at the wall may be estimated as follows:

(a) In Figure 5-2, let B represent a water depth of 8 meters, E the point of slope break at the depth of about 2 meters (6.5 feet), and C the present position of the berm crest. If it is desired to build a structure with an economic life estimated at 50 years at point A and it is found that  $n$  is the annual average loss of beach width at the berm, then in 50 years without the structure this berm will retreat a distance  $50n$  to point D.

(b) From D to the elevation of point E, draw a profile D-F parallel to C-E, and connect points B and F. This dashline, D-F-B, will represent the approximate profile of beach after 50 years without the structure. The receded beach elevation at the structure's location will be approximated by point A'. Similar calculations may be made for anticipated short-term beach losses caused by storms. Storm erosion generally results in a greater loss of beach material above the mean low water (MLW) level, because the superelevation of the water level (storm surge) allows storm waves to act on the upper part of the beach.

Other factors considered in planning and design are the depth of wall penetration to prevent undermining, tiebacks or end walls to prevent flanking, stability against saturated soil pressures, and the possibility of soil slumping under the wall.

### III. PROTECTIVE BEACHES

#### 1. Functions.

Beaches can effectively dissipate wave energy and are classified as shore protection structures of adjacent uplands when maintained at proper dimensions. Existing beaches are part of the natural coastal system and their wave dissipation usually occurs without creating adverse environmental effects. Since most beach erosion problems occur when there is a deficiency in the natural supply of sand, the placement of borrow material on the shore should be considered as one shore stabilization measure. It is advisable to investigate the feasibility of mechanically or hydraulically placing sand directly on an eroding shore, termed *beach restoration*, to restore or form, and subsequently maintain, an adequate protective beach, and to consider other remedial measures as auxiliary to this solution. Also, it is important to remember that the replenishment of sand eroded from the beach does not in itself solve an ongoing erosion problem and that periodic replenishment will be required at a rate equal to natural losses caused by the erosion. Replenishment along an eroding beach segment can be achieved by stockpiling suitable beach material at its updrift end and allowing longshore processes to redistribute the material along the remaining beach. The establishment and periodic replenishment of such a stockpile is termed *artificial beach nourishment*. Artificial

nourishment then maintains the shoreline at its restored position. When conditions are suitable for artificial nourishment, long reaches of shore may be protected at a cost relatively low compared to costs of other alternative protective structures. An additional consideration is that the widened beach may have additional benefits as a recreation feature.

Under certain conditions, a properly designed groin system may improve a protective beach. However, this method must be used with caution, for if a beach is restored or widened by impounding the natural supply of littoral material, a corresponding decrease in supply may occur in downdrift areas with resultant expansion or transfer of the problem area. Detrimental effects of groins can usually be minimized by placing artificial fill in suitable quantity concurrently with groin construction to allow downdrift bypassing of littoral material; such stockpiling is called *filling the groins*. Groin construction should be sequential from farthest downdrift to the most updrift location within the system in order to achieve maximum natural filling of the groin compartments.

Groins may be included in a beach restoration project to reduce the rate of loss and therefore the nourishment requirements. When groins are considered for use with artificial fill, their benefits should be carefully evaluated to determine their justification. Such justification could be based on the fact that groins will provide a greater reduction in the annual nourishment costs than the increase annual charges for groin construction (see Ch. 5, Sec. VI,10).

## 2. Limitations.

The decision to use groins as part of a protective beach depends first on the availability of suitable sand for the purpose, and if available, on the cost per unit volume of fill and the cost of groin construction. Often the cost per cubic meter of sand for small projects is quite high due to the high expense of mobilizing and demobilizing the equipment needed for project construction, whereas for larger fills the same expense constitutes a much smaller proportion of the project funds. Also, artificial nourishment can be quite costly per unit length of short shore segments because of the rapid erosion of the widened beach which projects significantly seaward of the adjacent shores to create a *soft erodible headland* on which wave energy is focused. The resulting high nourishment requirements may be justified for short lengths of beach in cases where the artificial nourishment prevents the enlargement of the problem area to downdrift shores. Difficulties may be encountered in financing a shore protection method (in this case) which provides protection beyond the immediate problem area. The use of coarser than natural, and consequently more stable, fill material in the original restoration may reduce nourishment requirements, but may be less suitable as wildlife habitat or for human recreation. The introduction of unnatural material may also have other undesirable long-term effects to adjacent shorelines. A sacrificial veneer of fine material over coarser, more protective material would emulate natural conditions at some west coast and Hawaiian beaches.

## 3. Planning Criteria.

Planning of a protective beach by artificial nourishment requires the following:

(a) Determination of the longshore transport characteristics of the project site and adjacent coast and deficiency of material supply to the problem area.

(b) Determination of the composite average characteristics of the existing beach material, or native sand, in the zone of active littoral movement.

(c) Evaluation and selection of borrow material for the initial beach fill and periodic nourishment, including the determination of any extra amount of borrow material required for placement based on the comparison of the native beach sand and borrow material.

(d) Determination of beach berm elevation and width.

(e) Determination of wave-adjusted foreshore slopes.

(f) Determination of beach-fill transition.

(g) Determination of feeder-beach (stockpile) location.

a. Direction of Longshore Transport and Deficiency of Supply. The methods of determining the predominant direction of longshore transport are outlined in Chapter 4, Section V. The deficiency of the material supply is the rate of loss of beach material--the rate at which the material supply must be increased to balance the transport by littoral forces to prevent net loss. If no natural supply is available as downdrift from a major littoral barrier, the net rate of longshore transport required will approximate the deficiency in supply. A comparison of surveys of accreting or eroding areas over a long period of time is the best method of estimating the longshore transport rate (the nourishment required to maintain stability of the shore). Collecting long-term survey data both before and after project construction is recommended. When surveys suitable for volume measurements are unavailable, approximations computed from changes in the shore position, as determined from aerial photography or other suitable records, are often necessary. *For such computations, the relationship in which 1 square meter of change in beach surface area equals 8 cubic meters of beach material (1 square foot of change in beach surface area equals 1 cubic yard of beach material) appears to provide acceptable values on exposed seacoasts.* This relationship presumes the active beach profile extends over a range in elevation of approximately 8 meters (27 feet). The relationship should be adjusted accordingly for shores with greater or less extensive active beach profiles.

b. Description of Native Beach Sand. It is first necessary to sample and characterize native beach sand to obtain a standard for comparing the suitability of potential borrow sediments. Native sediments constitute those beach materials actively affected by beach processes during a suitable period of time (1-year minimum). During a year, at least two sets of samples should be collected from the surface of the active beach profile which extends from an upper beach elevation of wave-dominated processes seaward to an offshore depth or "seaward limit" of littoral sand movement. Ideally, a "winter" and "summer" beach condition should be sampled. The textural properties of all samples are then combined or averaged to form the native "composite" sample which serves as the native beach textural standard. Textural properties of

native sand are selected for the comparison because they result from the selective winnowing and distribution of sediment across the active profile by shoreface processes; their distribution reflects a state of dynamic equilibrium between sediments and processes within the system. See Hobson (1977) and Hands and Hansen (in preparation, 1985) for specific sampling guidelines; a discussion of composite samples, and a determination of offshore limits for sampling.

c. Selection of Borrow Material. After the characteristics of the native sand and the longshore transport processes in the area are determined, the next step is to select borrow material for beach fill and for periodic nourishment. As explained in the previous paragraph, an average native texture, called the *native composite*, is used to evaluate the suitability of potential borrow sand because the native textural patterns are assumed to be the direct response of sand sorting by natural processes. Simply stated, it is assumed that these same processes will redistribute borrow sand that is placed on the beach in a similar textural pattern as the native sand along the profile considering the differences between native and borrow sand texture. Sorting and winnowing action by waves, tides, and currents will therefore tend to generally transport finer sizes seaward, leave the coarsest sizes slightly shoreward of the plunge point, and cover the beach face and remaining offshore areas with the more medium sand sizes. Some sediment sizes that are in borrow material and not in the native beach sand may not be stable in the beach environment. Extremely fine particle sizes are expected ultimately to be moved offshore and lost from the active littoral zone while fragile grains, such as some shells, will be broken, abraded and possibly lost. These kinds of changes to the borrow sediment will, through time, make the texture of the beach fill more like the original native sediment but will, in the process, reduce the original volume of fill placed on the beach.

Borrow sediments containing organic material or large amounts of the finer sand fractions may be used as beach fill since natural sorting and winnowing processes can be expected to clean the fill material. This has been confirmed with fills containing foreign matter at Anaheim Bay and Imperial Beach, California, and Palm Beach, Florida. Also fill material darkened by organic material (Surfside/Sunset Beach, California) or "reddened" by oxidized clay minerals (Imperial Beach, California) will be bleached quickly by the sun to achieve a more natural beach color. Material finer than that exposed on the natural beach face will, if exposed on the surface during a storm, move to a depth compatible with its size to form nearshore slopes flatter than normal slopes before placement. Fill coarser than the sand on the natural beach will tend to remain on the foreshore and may be expected to produce a steeper beach. However, coarser material moved offshore during storms may not be returned to the beach during poststorm periods. The relationship between grain size and slope is discussed in Chapter 4, Section V,2,f. If borrow sand is very coarse, it will probably be stable under normal as well as more severe conditions, but it may make the beach less desirable for recreational use or as wildlife habitat. If the borrow material is much finer than the native beach material, large amounts will move offshore and be lost from the beach. Angularity and mineral content of the borrow material may also prove important factors in its redistribution, deflation, and the esthetic qualities of the beach.

The distribution of grain sizes naturally present on a stable beach represents a state of dynamic equilibrium between the supply and the loss of material of each size. Coarser particles generally have a lower supply rate and a lower loss rate; fine particles are usually more abundant but are rapidly moved alongshore and offshore. Where fill is to be placed on a natural beach that has been relatively stable (i.e., exhibiting a steady rate of change or dynamic stability, or only slowly receding) the size characteristics of the native material can be used to evaluate the suitability of potential borrow material. Borrow material with the same grain-size distribution as the native material is most suitable for fill; material slightly coarser is usually suitable. If such borrow material is available, the volume required for fill may be determined directly from the project dimensions, assuming that only insignificant amounts will be lost through sorting and selective transport and that the sorting is not significantly different from the native material. In cases where these conditions do not apply, an additional volume of fill may be required as determined by an overfill factor.

(1) Overfill Factor. Unfortunately it is often difficult to find economical sources of borrow material with the desired grain-size distribution. When the potential borrow material is finer than the native material, large losses of the beach-fill material often take place immediately following placement. Currently, there is no proven method for computing the amount of overfill required to satisfy project dimensions. Krumbein's (1957) study provides a quantitative basis for comparison on the material characteristics considered to have the greatest effect on this relationship. Subsequent work by Krumbein and James (1965), James (1974), Dean (1974), and James (1975) developed criteria to indicate probable behavior of the borrow material on the beach. The use of the overfill criteria developed by James (1975) will give the best results in the majority of cases. It should be stressed, however, that these techniques have not been fully tested in the field and should be used only as a general indication of possible beach-fill behavior.

The procedures require that enough core samples be taken from the borrow area to adequately describe the composite textural properties throughout the entire volume of the borrow pit (see Hobson, 1977). Textural analyses of both borrow and native beach samples can be obtained using either settling or sieving grain-size analysis techniques. The composite grain-size distributions are then used to evaluate borrow sediment suitability.

Almost any offshore borrow source near the shore will include some suitable size material. Since the source will control cost to a major degree, an evaluation of the proportional volume of borrow material with the desired characteristics is important in economic design. The overfill criteria developed by James (1975), presented graphically in Figure 5-3, give a solution for the overfill factor,  $R_A$ , where

$R_A$  = the estimated number of cubic meters of fill material required to produce 1 cubic meter of beach material when the beach is in a condition compatible with the native material,

$\sigma_\phi$  = the standard deviation and is a measure of sorting (see Ch. 4, Sec. II) where

$$\sigma_{\phi} = \frac{(\phi_{84} - \phi_{16})}{2} \quad (5-1)$$

$M_{\phi}$  = the phi mean diameter of grain-size distribution (see Ch. 4, Sec. II) where

$$M_{\phi} = \frac{(\phi_{84} + \phi_{16})}{2} \quad (5-2)$$

-<sub>b</sub> = subscript b refers to borrow material

-<sub>n</sub> = subscript n refers to natural sand on beach

$\phi_{84}$  = 84th percentile in phi units

$\phi_{16}$  = 16th percentile in phi units

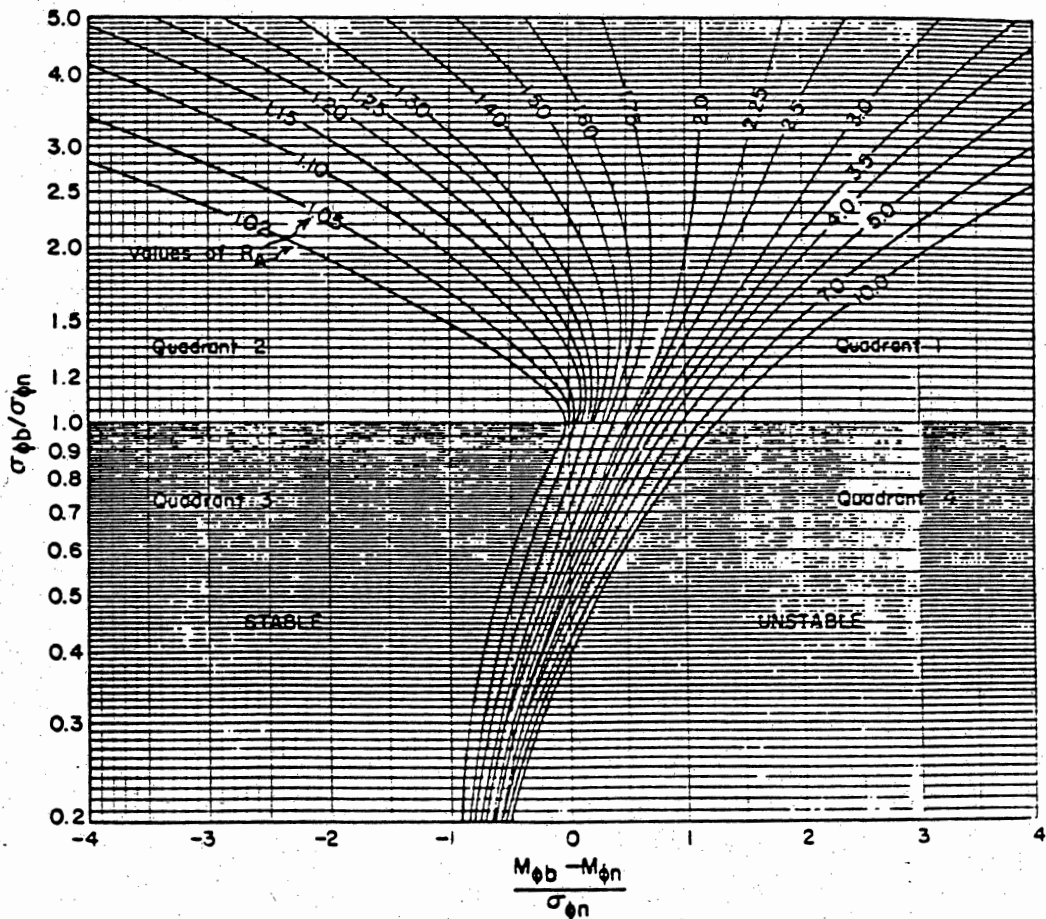


Figure 5-3. Isolines of the adjusted overfill factor,  $R_A$ , for values of phi mean difference and phi sorting ratio (from James, 1975).

This technique assumes that both composite native and borrow material distributions are nearly lognormal. This assumption is correct for the composite grain-size distribution of most natural beaches and many borrow materials. Pronounced bimodality or skewness might be encountered in potential borrow sources that contain multiple layers of coarse and fine material, such as clay-sand depositional sequences, or in borrow zones that crosscut flood plain deposits associated with ancient river channels.

The four possible combinations that result from a comparison of the composite grain-size distribution of native material and borrow material are listed in Table 5-1 and indicated as quadrants in Figure 5-3.

The engineering application of the techniques discussed above requires that basic sediment-size data be collected in both the potential borrow area and the native beach area. An estimation of the composite grain-size characteristics of native material should follow the guidelines in Hobson (1977). The determination of the composite distribution of the borrow zone material depends on the variation of materials and their individual properties. If the textural properties of the potential borrow material exhibit considerable variation in both area and depth, extensive coring may be required to obtain reliable estimates of the composite distribution of properties. Since detailed guidelines have not been established for evaluating borrow deposits, it is recommended that core sampling be carried out as a two-phase program--the first phase inventories the general borrow region and the second phase samples in detail those areas with the greatest potential.

(2) Renourishment Factor. James (1975) provides a second approach to the planning and design of nourishment projects. This approach, which relates to the long-term maintenance of a project, asks the basic question of how often renourishment will be required if a particular borrow source is selected that is texturally different from the native beach sand. With this approach, different sediment sizes will have different residence times within the dynamic beach system. Coarse particles will generally pass more slowly through the system than finer sizes. This approach also requires accurate composites of native and borrow sediment textures.

To determine periodic renourishment requirements, James (1975) defines a renourishment factor,  $R_J$ , which is the ratio of the rate at which borrow material will erode to the rate at which natural beach material is eroding. The renourishment factor is given as

$$R_J = e \left[ \Delta \left( \frac{M_{\phi b} - M_{\phi n}}{\sigma_{\phi n}} \right) - \frac{\Delta^2}{2} \left( \frac{\sigma_{\phi b}^2}{\sigma_{\phi n}^2} - 1 \right) \right] \quad (5-3)$$

where  $\Delta$  is a winnowing function. The  $\Delta$  parameter is dimensionless and represents the scaled difference between the phi means of noneroding and actively eroding native beach sediments. James (1975) estimates values of  $\Delta$  ranging between 0.5 and 1.5 for a few cases where appropriate textural data were available and recommends  $\Delta = 1$  for the common situation where the textural properties of noneroding native sediments are unknown. Equation (5-3) is plotted in Figure 5-4 for  $\Delta = 1$ . Figure 5-3 should be used for

Table 5-1. Relationships of phi means and phi standard deviations of native material and borrow material.

Category		Relationship of Phi Means	Relationship of Phi Standard Deviations
Case	Quadrant in Fig. 5-3		
I	1	$M_{\phi b} > M_{\phi n}$ Borrow material is finer than native material	$\sigma_{\phi b} > \sigma_{\phi n}$ Borrow material is more poorly sorted than native material
II	2	$M_{\phi b} < M_{\phi n}$ Borrow material is coarser than native material	
III	3	$M_{\phi b} < M_{\phi n}$ Borrow material is coarser than native material	$\sigma_{\phi b} < \sigma_{\phi n}$ Borrow material is better sorted than native material
IV	4	$M_{\phi b} > M_{\phi n}$ Borrow material is finer than native material	

determining initial quantities of beach fill, and Figure 5-4 for determining how often renourishment may be required.

The renourishment and fill factors are not mathematically related to one another. Each relationship results from unique models of predicted beach-fill behavior which are computationally dissimilar although both use the comparison of native and borrow sand texture as input. Nevertheless, the models address the different problems in determining nourishment requirements when fill that is dissimilar to native sediments is to be used (fill factor) and in predicting how quickly a particular fill will erode (renourishment). For design purposes, the fill factor,  $R_A$ , or its equivalent, should be applied to adjust both initial and renourishment volumes (see Table 5-2). The renourishment factor,  $R_J$ , should be considered an independent evaluation of when renourishment will be required. Both models are simplistic descriptions of complex beach relationships, and there will be cases where the  $R_A$  and  $R_J$  values calculated for a particular borrow material suggest quite different responses from that material. One example is where the models suggest both that overage is required and that the borrow will erode much slower than native beach sediments. This situation could arise with coarser and more poorly sorted borrow sand where early winnowing would remove the overage volume of unstable finer sizes and leave a coarser-than-native sand that erodes slowly. For cases like this and in all cases where these models are applied, engineering judgment and experience must accompany design application.

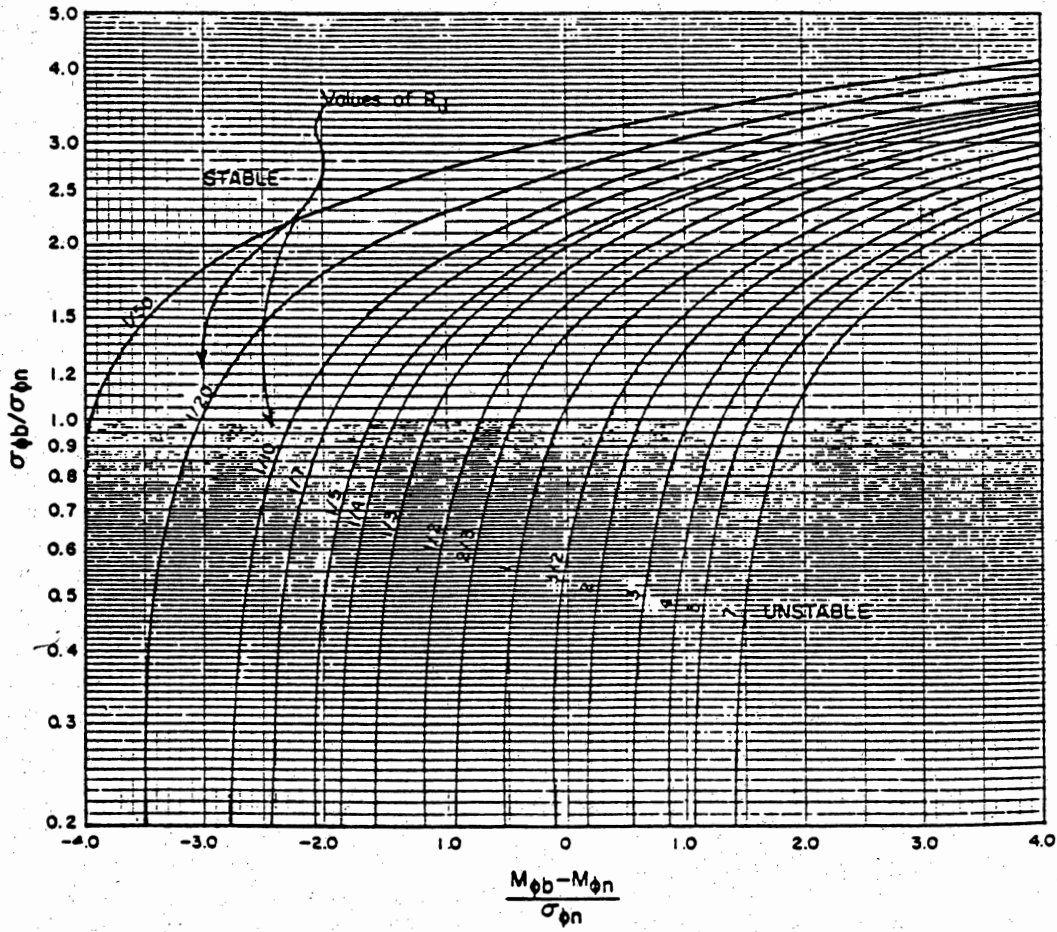


Figure 5-4. Isolines of the renourishment factor,  $R_J$ , for values of phi mean difference and phi sorting ratio,  $\Delta = 1.0$  (James, 1975).

Table 5-2. Comparison of composite grain-size distribution parameters and beach fill, Brunswick County, North Carolina.

	Sediment sources		
	Native	Borrow I (Middle ground)	Borrow II (Yellow Banks)
<b>Textural properties</b>			
$\phi_{16}$	1.10	0.58	1.22
$\phi_{84}$	2.70	2.54	2.66
Phi mean, $M_{\phi}$	1.90	1.56	1.94
Phi sorting, $\sigma_{\phi}$	0.80	0.98	0.72
$\sigma_{\phi b} / \sigma_{\phi n}$	-----	1.23	0.90
$(M_{\phi b} - M_{\phi n}) / \sigma_{\phi n}$	-----	-0.43	0.05
Percent sand	100.00	89.00	95.00
<b>Fill factors</b>			
$R_A$	-----	1.00	1.20
$R_G$ (see eq. 5-4)	-----	1.12	1.26
$R_J$	-----	0.51 <sup>1</sup>	1.16
<b>Fill requirements</b>			
Initial fill <sup>2</sup> (m <sup>3</sup> )	6,033,000	6,757,000	7,602,000
Yearly nourishment <sup>3</sup> (m <sup>3</sup> /yr)	232,000	232,000 <sup>1</sup>	269,000

<sup>1</sup> Use a retreat rate ( $R_J$ ) of unity to determine *first* renourishment needs. Use fill performance data for future renourishment planning.

<sup>2</sup> Values are adjusted products of initial fill needs (6,033,000 cubic meters) times  $R_G$ .

<sup>3</sup> Values are the adjusted *first-year* nourishment volumes ( $R_J \times 232,000$  cubic meters per year).  $R_J = 1$  is used for determining first nourishment using the middle-ground shoal borrow sediments as explained in footnote 1 above.

Application of both the overfill and renourishment techniques is demonstrated in the following example problems.

\*\*\*\*\* EXAMPLE PROBLEM 1 \*\*\*\*\*

GIVEN: Composite native beach material phi parameters

$$\phi_{84} = 2.47\phi \text{ (0.18 mm)}$$

$$\phi_{16} = 1.41\phi \text{ (0.38 mm)}$$

Composite borrow material parameters

$$\phi_{84} = 3.41\phi \text{ (0.09 mm)}$$

$$\phi_{16} = 1.67\phi \text{ (0.31 mm)}$$

FIND:

- (a) The fill factor,  $R_A$
- (b) The renourishment factor,  $R_J$

SOLUTION:

- (a) Using equation (5-2)

$$M_\phi = \frac{\phi_{84} + \phi_{16}}{2}$$

$$M_{\phi n} = \frac{2.47 + 1.41}{2} = 1.94 \text{ (0.26 mm)}$$

and

$$M_{\phi b} = \frac{3.41 + 1.67}{2} = 2.54 \text{ (0.17 mm)}$$

Using equation (5-1)

$$\sigma_\phi = \frac{\phi_{84} - \phi_{16}}{2}$$

$$\sigma_{\phi n} = \frac{2.47 - 1.41}{2} = 0.53$$

and

$$\sigma_{\phi b} = \frac{3.41 - 1.67}{2} = 0.87$$

The phi sorting ratio is

$$\frac{\sigma_{\phi b}}{\sigma_{\phi n}} = \frac{0.87}{0.53} = 1.64$$

and the phi mean difference is

$$\frac{M_{\phi b} - M_{\phi n}}{\sigma_{\phi n}} = \frac{2.54 - 1.94}{0.53} = 1.13$$

From Figure 5-3, the fill factor is

$$R_A = 2.25, \text{ i.e., } 2.3$$

(b) From Figure 5-4, the renourishment factor is

$$R_J = 1.33, \text{ i.e., } 1.3$$

The results indicate that the project requires 2.3 cubic meters of this borrow material fill to satisfy each cubic meter required by the project dimensions. Periodic renourishment using the same borrow material must be provided 1.3 times as often as using original nativelylike sediments in order to maintain project dimensions.

\*\*\*\*\*

\*\*\*\*\* EXAMPLE PROBLEM 2 \*\*\*\*\*

GIVEN: Composite native beach material phi parameters

$$\phi_{84} = 3.10 \text{ (0.12 mm)}$$

$$\phi_{16} = 1.86 \text{ (0.28 mm)}$$

Composite borrow material phi parameters

$$\phi_{84} = 3.25 \text{ (0.11 mm)}$$

$$\phi_{16} = 0.17 \text{ (0.89 mm)}$$

FIND:

- (a) The fill factor,  $R_A$
- (b) The renourishment factor,  $R_J$

SOLUTION:

- (a) Using equation (5-2)

$$M_{\phi} = \frac{\phi_{84} + \phi_{16}}{2}$$

$$M_{\phi n} = \frac{3.10 + 1.86}{2} = 2.48 \text{ (0.18 mm)}$$

and

$$M_{\phi b} = \frac{3.25 + 0.17}{2} = 1.71 \text{ (0.31 mm)}$$

Using equation (5-1)

$$\sigma_{\phi} = \frac{\phi_{84} - \phi_{16}}{2}$$

$$\sigma_{\phi n} = \frac{3.10 - 1.86}{2} = 0.62$$

and

$$\sigma_{\phi b} = \frac{3.25 - 0.17}{2} = 1.54$$

The phi sorting ratio is

$$\frac{\sigma_{\phi b}}{\sigma_{\phi n}} = \frac{1.54}{0.62} = 2.48$$

and the phi mean difference is

$$\frac{M_{\phi b} - M_{\phi n}}{\sigma_{\phi n}} = \frac{1.71 - 2.48}{0.62} = 1.24$$

From Figure 5-3, the fill factor is

$$R_A = 1.15$$

- (b) From Figure 5-4 and equation (5-3), the renourishment factor is

$$R_J = \frac{1}{45} \text{ or } 0.022$$

The results indicate that the project requires 1.15 cubic meters of this borrow material fill to satisfy each cubic meter required by the project dimensions. If the beach requires periodic renourishment, the renourishment must only be provided 0.022 times as often from the borrow material as from nativelylike material in order to maintain the desired beach profile. Please note that very low  $R_J$  values, as in this example problem, should be applied in design with caution. A conservative approach is recommended, or initially using an  $R_J$  equal to unity in these cases for planning the first renourishment and then later adjusting the value in accordance with the results of monitoring the performance of the project.

\*\*\*\*\*

The location of the borrow source is also a factor to be considered in project design. In the past, readily available sources have frequently been bays, lagoons, and onshore sites. Onshore sites generally require less sophisticated material-handling equipment than for offshore sites but the cost per cubic meter of land-derived material is often very high, which makes these sites unattractive borrow sources. Bay and lagoonal sediments are generally finer and more poorly sorted than native beach sand. Although these textural differences often result in volumes of borrow material several times that required by project dimensions, these sources are still often selected as the most cost effective due to the proximity of bays and lagoons to project sites and because of the shelter they provide to dredging equipment. Few bays and lagoons are currently available as sources because of environmental considerations. The development of more seaworthy and innovative dredging plants has made offshore sources of borrow material more attractive, and to date, offshore sources have generally provided fill materials that are initially more compatible with native beach sands.

Hobson (1977) evaluated two borrow areas for beach fill at Oak Island, North Carolina--the Yellow Banks area on the mainland and the middle-ground shoal at the mouth of the Cape Fear River. U.S. Army Engineer District, Wilmington (1973), found it practical to account for the proportion of grain sizes finer than sand, which are considered unstable on the beach, by increasing the fill factor using the following formula:

$$R_G = R_A \times \frac{100}{\% \text{ sand}} \quad (5-4)$$

where  $R_G$  is the modified fill factor. Comparisons of the two borrow areas are shown in Table 5-2.

For this particular project, the estimated mobilization-demobilization expenses and cost per cubic meter of fill estimates, used in the original General Design Memorandum (U.S. Army Engineer District, Wilmington, 1973), favor the Yellow Banks area even when renourishment is considered. However, as the use of offshore borrow sites becomes more commonplace and the techniques of their exploitation better understood, the costs of offshore sediments are likely to become more economical when compared with conventional

sources. Offshore borrow sites have been used successfully in the construction of major beach restoration projects at Rockaway Beach, New York; Dade County, Florida; Redondo Beach, California; and Harrison County, Mississippi.

d. Berm Elevation and Width. Beach berms are formed by the deposit of material by wave action. The height of a berm is related to the cycle change in water level, normal foreshore and nearshore slopes, and the wave climate. Some beaches have no berms; others have one or several. Figure 5-5 illustrates a beach profile with two berms. The lower berm is the natural or normal berm and is formed by the uprush of normal wave action during the ordinary range of water level fluctuations. The higher berm, or storm berm, is formed by wave action during storm conditions. During most storms, waves and wave setups will cause an increase in the normal water level on the beach. Wave overtopping and backrush with sufficient duration may completely obliterate the natural beach berm.

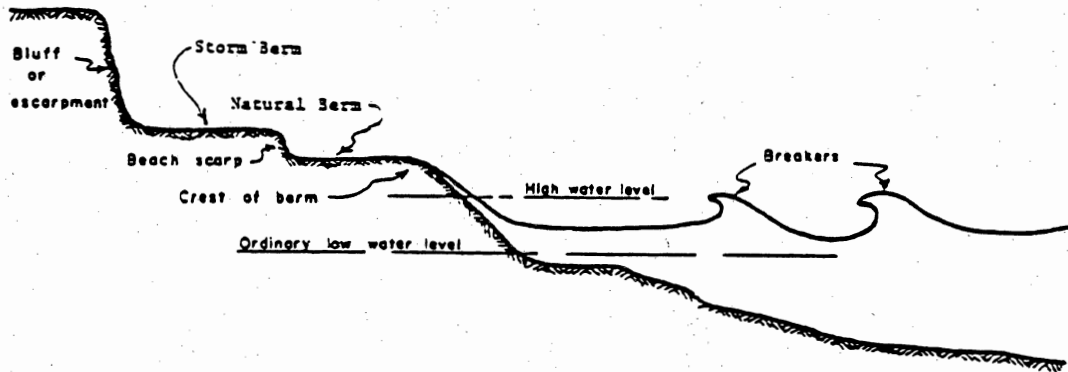


Figure 5-5. Beach berm system.

The degree of protection to the backshore depends greatly on the effectiveness of the storm berm. Beach berms must be carefully considered in the planning of a beach fill. If a beach fill is placed to a height lower than the natural berm crest, a ridge will form along the crest and high water may overtop the berm crest causing ponding and temporary flooding of the backshore area. Such flooding, if undesirable, may be avoided by placing the fill to a height slightly above the natural berm crest elevation. Several alternative techniques may be employed to estimate the height of the berm for design purposes (see Ch. 7, Sec. II). If a beach exists at the site, the natural berm crest height can be measured and future berm elevations can be estimated. An estimate may also be made by comparing the beach profile at the site with beach profiles at sites of similar exposure characteristics (waves and tides) and similar size beach material. If enough wave data applicable to the project site (either developed from synoptic surface weather charts or actual records) are available, wave runup (discussed in Ch. 7, Sec. II) can be estimated to establish a design berm crest height and adjacent beach slope.

Criteria for specifying berm width depend on several factors. If the purpose of the fill is to restore an eroded beach to protect backshore improvements from major storm damage, the width may be determined as the protective width which has been lost during storms of record plus the minimum

required to prevent wave action from reaching improvements. Where the beach is used for recreation, the justification for the increased width of the beach may be governed by the area required for recreational use. Although there is no current formally established standard in the United States, previous values of 7 to 9 square meters (75 to 100 square feet) of dry beach per bather have been used. Where the beach fill serves as a stockpile to be periodically replenished, the berm should be wide enough to accommodate the recession expected during the intervals between nourishment operations.

e. Slopes. The toe of a stockpile of beach material should not extend deeper than the effective limiting depth of sediment transport by wave-driven longshore currents. Chapter 4, Section V,2,c can be used to calculate this maximum depth. Also, the study of general offshore topographic relationships provides estimates of this 9-meter depth below low water datum for eastern and western seacoasts and about a 6-meter depth on the Great Lakes and gulf coasts. The initial slope of any beach fill will naturally be steeper than that of the natural profile over which it is placed. The subsequent behavior of the slope depends on the characteristics of the fill material and the nature of the wave climate.

Design slopes are generally used for computing fill requirements since natural processes are expected to generally shape the profile into an environmentally equilibrated form. In practice, the initial foreshore slope of a fill is designed parallel to the local or comparable natural beach slope above low water datum. The design of the offshore slope should be determined after careful investigation of all pertinent data from low water datum to the appropriate offshore depth. The design slope is derived through synthesis and the averaging of existing data within and adjacent to the problem area, and is usually significantly flatter than the foreshore slope. Design slopes based on such data are usually in the range of 1:20 to 1:30 from low water datum to the intersection with the existing bottom.

Construction slopes are seldom the same as design slopes because of the working limitations of equipment used to place and shape the fill, and because the selective sorting of the fill by waves and currents will naturally shape the profile after nourishment. Two construction approaches are recommended. One is to overbuild the upper part of the beach and the other approach is to create an initial construction profile that extends significantly offshore.

The "overbuilding" approach was adopted for fills at Carolina Beach in 1970 and Wrightsville Beach in 1981. This method places the required fill volume onshore at an elevation equal to the natural beach berm elevation and has a fill slope that is steeper than the equilibrium design slope on the seaward side. A part of the fill is placed underwater, in an amount determined by the fill's berm width and seaward slope. Readjustment of the fill sediments into a more equilibrated profile shape is accomplished almost entirely by waves and currents that erode and redistribute the artificially piled sediments and remove the finer unstable sizes through winnowing action. In general, the fill volume placed should be adequate to establish the design profile, after winnowing, and to provide an advance nourishment supply of sediment. The total volume can be determined by using both the design drawings and the calculated yearly rate of sediment loss from the beach, and by applying the overfill ratio,  $R_A$ , to these values in cases where the borrow material to be used is dissimilar to native beach sediments. Scarping is one

problem that may be encountered in the overbuilding approach. Steep scarps may develop at the toe of the fill as waves begin the readjustment, and these scarps may make access to the beach difficult, as occurred in a California beach-fill project constructed at Surfside and Sunset Beaches in 1979. The scarping process may also increase erosion rates of the fill as large volumes of sand avalanche into the littoral system when waves oversteepen or undercut the fill slope. Scarping does not always develop but it can result more easily when there is an abrupt transition between a steep fill slope and a flatter natural offshore slope.

The second approach, which may reduce scarping, is to initially place more of the fill offshore. Redistribution of the sediment across the profile by waves and currents will still take place after construction to reequilibrate profile shape, but much of the reworking will occur offshore of the fill rather than onshore. Using this construction approach, beach nourishment projects in 1975 and 1977 at Rockaway Beach, New York, were conducted hydraulically with the contractor's payment dependent on the amount of material placed on the beach to the offshore depth where the 1:30 design slope met the existing bottom. This approach also provided the contractor an incentive to minimize his fill losses. In comparing the two approaches, the offshore depth at Rockaway Beach ranged between 4 and 6 meters below MLW datum versus depths of -1 to -3 meters mean sea level (MSL) for the overbuilt fill sections at Carolina and Wrightsville Beaches in North Carolina.

Both construction approaches result in an onshore fill section that is placed to a desired berm width and has steep initial slopes. This onshore fill eventually adjusts to a natural slope and narrows the berm, leaving the impression that much of the fill has been lost, although it has only moved offshore to reestablish a stable profile.

f. Beach-Fill Transition. The alignment of a nourished beach segment generally parallels the existing shoreline but is offset seaward by the width of the fill. The nourished segment can be thought of as a subtle headland that protrudes from the existing coast. Transition from the fill to the existing shoreline can be accomplished either by constructing "hard" structures, such as groins and jetties, which compartment the fill or by filling transition zones between the terminal ends of the beach fill and the unrestored beach.

Groins, jetties, and headlands do allow an abrupt termination of the beach fill at the project limits. However, these hard structures are often quite costly, unacceptable esthetically, and more importantly, they may interrupt or modify the natural longshore transport flow in an area. If groins are selected to terminate a fill, Chapter 5, Section VI should be used to determine design components such as cross section, materials, and length.

If filled transition zones are selected, their length and transition angle will determine the additional volume of fill, and hence the cost, required for the project. The orientation of the transition shoreline will differ from the natural shoreline alignment, resulting in different erosion rates since the rate of littoral transport depends on the relative angle between the breakers and a particular shoreline segment.

One method of evaluating different transition plans is to compare total life cycle costs for the beach restoration and periodic nourishment projects with alternate combinations of transition angle and length and select the plan that provides optimum improvement (e.g., the plan with the lowest life cycle costs to accomplish the project objectives). Chapter 4, Section V,3 provides equations and procedures for determining longshore transport rates along beach segments with varied transition angles. As the transition angle decreases,

- (1) The expected rate of erosion per unit length of the transition zone decreases.
- (2) The length of the transition fill increases and hence the volume of required fill increases.
- (3) The volume of fill required for periodic nourishment increases in order to maintain the longer length of project shoreline.

These varying relationships make possible an optimization procedure to minimize the cost of a transition plan.

An example situation could be to minimize transition costs for a beach fill on a beach which

- (1) Is widened 56 meters (184 feet).
- (2) Requires 7.5 cubic meters of fill per square meter (0.9 cubic yard per square foot) of beach.
- (3) Is eroding at a rate of 22 cubic meters per linear meter (8.8 cubic yards per foot).
- (4) Has a left-to-right yearly littoral transport rate of 425,000 cubic meters (555,900 cubic yards) generated by waves with a breaker angle of  $23^\circ$ .
- (5) Has a right-to-left yearly littoral transport rate of 85,000 cubic meters (111,200 cubic yards) generated by waves with a breaker angle of  $15.5^\circ$ .

A comparison of alternate transition plans for this example indicates that minimal costs would be achieved with a long transition segment (1070 meters or 3510 feet) oriented at about  $3^\circ$  to the existing shoreline. This example is intended to illustrate that optimal transition zones are generally quite long and oriented at gentle angles to the existing shore. It may sometimes be more practical, however, to either compartment the beach-fill material with groins or construct fairly sharp transition angles and deal with high rates of fill loss at project boundaries if land ownership constraints or other factors preclude the construction of the optimum transition.

g. Feeder Beach Location. Dimensions of a stockpile or feeder beach are generally governed primarily by economic considerations involving comparisons of costs for different nourishment intervals. Therefore, planning a stockpile location must be considered in conjunction with stockpile dimensions. If the problem area is part of a continuous and unobstructed beach, the stockpile is

located at the updrift end of the problem area. Until the stockpile material is transported by littoral processes to the beach area downdrift of the stockpile location, that beach may be expected to recede at the same rate as determined from historical survey data. If economically justified, stockpiles may be placed at points along the problem area, which will decrease the time interval between stockpile placement and complete nourishment of the area. Stockpile lengths from a few hundred meters to a kilometer have been employed successfully. If the plan involves a feeder beach just downdrift of a coastal inlet, wave refraction and inlet currents must be considered to locate the feeder beach so that a minimum of material is transported into the inlet. A supplementary structure (such as a groin) may be needed to reduce the material movement into the inlet caused by either tidal currents or a change in longshore transport.

The nearly continuous interception of littoral material on the updrift side of an inlet and the mechanical transportation of the material to a point on the downdrift shore (sand bypassing) constitute a form of stockpiling for artificial nourishment to the downdrift shore. In this type of operation, the size of the stockpile or feeder beach will generally be small; the stockpile material will be transported downdrift by natural forces at a rate about equal to or greater than the rate of deposition. For the suggested location of the stockpile or feeder beach for this type of operation, see Chapter 6, Section V (SAND BYPASSING). The need for a jetty or groin between the stockpile or feeder beach and the inlet to prevent the return of the material to the inlet should be evaluated if such structures do not already exist.

#### IV. SAND DUNES

##### 1. Functions.

Sand dunes are an important protective formation. The dune ridges along the coast prevent the movement of storm tides and waves into the land area behind the beach. Dunes prevent storm waters from flooding the low interior areas. Dune ridges, which are farther inland, also protect but to a lesser degree than foredunes. Well-stabilized inland ridges are a second line of defense against erosion should the foredunes be destroyed by storms. The use of native vegetation may be desirable to stabilize the dune sand that might migrate over adjacent areas and damage property (see Fig. 5-6). Stabilizing dunes also prevent the loss of their protection. At locations that have an adequate natural supply of sand and are subject to inundation by storms, a belt of dunes can provide protection more effectively at a lower cost than a seawall (see Ch. 6, Sec. IV).

Sand dunes near the beach not only protect against high water and waves, but also serve as stockpiles to feed the beach. Sand accumulation on the seaward slope of a dune will either build or extend the dune toward the shoreline. This sand, once in the dune, may be returned to the beach by a severe storm and thus nourish the beach. Figure 5-7 is a schematic diagram of a storm wave attack on the beach and dune. As shown, the initial attack of storm waves is on the beach berm fronting the dune. Waves attack the dune when the berm is eroded. If the wave attack lasts long enough, the waves can overtop the dune, lowering the dune crest. Much of the sand eroded from the berm and dune is transported directly offshore and deposited in a bar formation. This process helps to dissipate incident wave energy during a storm,

SENATE AND GENERAL ASSEMBLY  
BEACH EROSION COMMISSION ADDRESS  
SEPTEMBER 15, 1993

Assemblyman Gibson and members of the Joint Senate and General Assembly Beach Erosion Commission, on behalf of Ocean City thank you for the kind invitation to address you about our beachfill project and Ocean City's cost sharing approach to beach erosion.

5.4 million yards of sand was placed upon the Ocean City beaches from the Egg Harbor Inlet to 36th Street. Imagine 175 football fields filled 25 feet high with sand. That's equivalent to the quantity pumped in Ocean City in 1992-1993. No other beach pumping project of this magnitude has been attempted before on the east coast.

The program authorized by the Federal government, is under the direction of the U.S. Army Corps of Engineers in cooperation with the New Jersey Department of Environmental Protection and Energy.

The Committee on Public Works of The House of Representatives adopted a resolution approving the Great Egg Harbor Inlet and Peck's Beach beach replenishment project.

After the initial beachfill from the Inlet to 36th Street there will be periodic renourishment over the next 50 years.

The beach profile after the initial dredging is to elevation 10 feet from mean sea level and a level berm that extends at least 200 feet eastwardly from the boardwalk, bulkhead or dune from which sand slopes 30 to 1 until reaching mean sea level.

A combination of public funding sources supports the estimated \$24 Million project. Sixty-seven percent of the total has been funded by the Federal government, 25% was supported by the state and the remainder, 8%, is being funded through local city funds.

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The December 11th to 14th storm resulted in a 27% sand loss from beach erosion from 4 days of multiple consecutive devastating high tides, but it is important to remember that beach erosion during storms is normal, and in fact expected. Beaches are in a continual state of change. Sand moves on and off shore and along the shore seasonally and as the result of waves, tide changes and storms. The beach constructed in Ocean City takes into account all of these dynamic forces and has been designed in height, width and slope to act as a buffer to protect property from wave attack by sacrificing sand to the energy of the ocean. That means that the project did its job by sacrificing sand to the ocean rather than allowing damage to oceanfront boardwalk and commercial and residential properties.

Storms in both October 1991 and January 1992 devastated beach, dunes and boardwalk and some commercial and residential properties. Without the beach replenishment project and with diminished protection, almost certainly much of the boardwalk and commercial property in the center of town would have been damaged so badly in the December 1992 storm that repairs would not have been possible before the 1993 tourist season, resulting in losses of perhaps \$100 Million to private and public property and a sizeable portion of the \$500 Million tourist business.

The sand "bank" from 36th Street to 60th Street in Ocean City has been depleted. There is no reserve sand left with which to build dunes, and the beaches are flooded to the bulkhead during many high tide occurrences, especially at full moon, new moon and during any rain event accompanied by wind. The City

will need to pump approximately 2.5 miles of beaches, comprising about 62 acres, or 1.2 million cubic yards of sand. This sand will be needed to re-establish our beaches and to provide a foundation for construction of dunes. In the short run and as a mitigation effort, sand pumping should be used to build a foundation at an appropriate elevation (8 feet or more) for dunes to be constructed and maintained. It takes 100 feet of "dry beach" above the high tide line to enable enough dry sand to blow and be caught by sand fencing in order for dunes to build.

In the longer term, a beach replenishment strategy should be more widely adopted. The Army Corps of Engineers has concluded that:

"Beach nourishment represents the least environmentally damaging structural method of reducing potential storm damages at a reasonable cost and in a way that is both socially acceptable and yet is feasible and proven to work in high energy environments."

Beach nourishment is aesthetically more pleasing than other structural alternatives because it represents the smallest departure from the existing conditions in a visual and physical sense.

New Jersey State Library

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To insure that beaches will always be available to all populations, Ocean City suggests a more aggressive cost-sharing approach to beach maintenance. Because the federal and state governments are maintaining a wide inventory of infrastructure categories such as highways, bridges and national and state parks, they should be more willing to contribute toward the maintenance of their seashores as well. Local governments also have important roles in order to be truly partners. We suggest a four part partnership:

1. that the federal government, through FEMA, consistent with the goal of Repetitive Loss Reduction, fund initial beach renourishment in geographic areas not otherwise assumed by the Army Corps of Engineers;
2. that the municipal government be responsible for obtaining all necessary property easements and to topographically survey and monitor beach profiles on a regular basis at regular time intervals and to maintain dunes, dune fencing and dune plantings;
3. that the state and county governments be responsible for funding periodic beach renourishment on a regular basis when topographical information suggests it to be appropriate as developed by municipal governments; and
4. that large scale renourishment be financed by the federal government every 10 to 15 years, if necessary, and also after major storm events consistent with National Disaster Declaration policy.

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**9/15/93 STATEMENT BY MAYOR JOHN J. PANTALONE  
SENATE & GENERAL ASSEMBLY BEACH EROSION COMMISSION  
OCEAN CITY, NEW JERSEY**

I would like to thank Assemblyman Gibson for his valuable work with the Senate and General Assembly Beach Erosion Commission and the opportunity to speak with our distinguished guests this morning.

There is no doubt that the Jersey shore, and more specifically, the beaches of Cape May County, are of great importance to our state and local economies. There can also be no doubt that as elected and appointed officials, we have the responsibility to pursue all reasonable measures to ensure the continued preservation and replenishment of this great natural resource.

As some of you may know, the Borough of Wildwood Crest does not presently suffer from any beach erosion. As a matter of fact, our situation is quite to the contrary. We are both very proud and thankful that our beaches are among the finest and most beautiful on the entire eastern seaboard.

However, notwithstanding our great fortune, I fully understand the need to rectify the continued beach erosion problems that plague our neighboring communities. I completely support the development and implementation of a long range comprehensive beach preservation program to help those communities remedy a very serious problem that threatens the lifeblood of the entire Cape May County tourist industry.

Before closing, I would like to take this opportunity to make one additional observation concerning the preservation of our environment. This statement is largely directed to those federal representatives in attendance this morning. The federal government, which owns a third of all land in the United States, is reportedly spending an incredible \$115 billion a year to enforce environmental laws and regulations.

**-NEXT PAGE PLEASE-**

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Page Two

Mayor John J. Pantalone

Statement to the Senate & Assembly Beach Erosion Commission

To police this enormous amount of federally owned land, the number of law enforcement personnel assigned to carry out of all the new environmental laws and regulations must rival the total numbers of local police officers nation-wide.

It seems that every couple years, a few scaremongers convince large numbers of people that a hideous environmental threat looms on the horizon, thus creating another excuse for the continued expansion of government power. Right now there are unchallenged claims of global warming, air pollution, ozone depletion, endangered species, and depleted wetlands. In each case, government intervention makes the problems worse, not better.

I encourage every representative here today, particularly the federal representatives, to carefully evaluate such claims, sift out those charges based not on scientific fact but only political correctness, and therefore avoid the continued implementation of rules and regulations which cause the unnecessary expenditure of billions of dollars from our hard-working taxpayers.

Thank you.

-END-

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