

**A Review of the Section 905(b) Analysis  
Wilmington Harbor Navigation Improvement Project  
North Carolina International Terminal  
Draft Dated February 2010  
Prepared by the  
US Army Corps of Engineers, Wilmington District.**

[Revised draft–April 22, 2010]

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**A Review of the Section 905(b) Analysis, Wilmington Harbor Navigation Improvement Project, North Carolina International Terminal, draft dated February 2010, prepared by the US Army Corps of Engineers, Wilmington District.**

The Wilmington District of the US Army Corps of Engineers has prepared a report of its analysis, pursuant to section 905(b) of the Water Resources Development Act of 1986, of proposed navigation improvements in the Cape Fear River to accommodate a large new container terminal proposed by the North Carolina State Ports Authority. The terminal would be called the North Carolina International Terminal (NCIT).

The report has been prepared in secret, and has not been released to the public. A draft dated February 2010 has been provided to an agency of the State of North Carolina, and thereby became subject to discovery pursuant to the North Carolina Public Records law.

The draft report is of distressingly poor quality, given the amount of money (\$96,000) available and the data available from previous studies of the Cape Fear River navigation channel, extensive preliminary engineering work done by CH2M Hill, Inc., for the North Carolina State Ports Authority, statistical information available from the Corps of Engineers and industry sources, extensive background reports available from Federal and State of North Carolina agencies, and comprehensive comment documents from interested parties.

Some elements of the report have been done in a workmanlike manner and are useful. The cost estimate for channel dredging and the outline and cost estimate for the recommended feasibility analysis are in this category. The report includes a checklist of environmental issues, and a helpful digest of comments from other agencies and the public.

But these useful items are in a report that is poorly organized and incomplete. Although the six planning steps specified for Corps of Engineers studies in its Principles and Guidelines are mentioned, they are not followed. The fundamentals of any scientific, engineering or planning study—clear statement of the problem and comprehensive inventory of conditions and circumstances—are either stated in a cursory fashion or missing altogether.

Because the necessary starting point is not adequately developed—indeed, not developed at all—whatever follows is not analysis but speculation. The Wilmington District report is not just useless, it is dangerous. It is the work product of a responsible agency of the United States government, and entitled to a presumption of regularity and reliability. This report betrays that reliance.

This review refers to section and page numbers of the subject report. Only those sections with most serious flaws are discussed.

## INTRODUCTION

The report has no introduction. No description of the project, its function and purpose, its location in the shadow of an ammunition depot and next to two nuclear reactors, its 600-acre woodland site with 86 acres of salt marsh. No mention of the intended size of the proposed terminal as second only to Port Elizabeth, New Jersey, on the East Coast. No discussion of the adequacy of the highway and rail infrastructure for such a project. No description of the Cape Fear River and its channel, the depth of the river at the terminal site, the type of vessel to be accommodated, the history of marine commerce in the region. No discussion of the existing Port of Wilmington with its container terminal operating at half of its capacity. No discussion of the proximity to the City of Southport and its historic district. Nothing about the Federal and State reserved natural areas on and in the Cape Fear River. The reader unfamiliar with the project is left to his own devices to discover just what is being analyzed and why. The only source of such information is the Web site of NoPort Southport at [www.noportsouthport.org](http://www.noportsouthport.org)

## 2. STUDY PURPOSE (page 1).

The report says that

The purpose of this Reconnaissance Phase Study is to determine whether there is a Federal (Corps) interest in participating in a cost shared Feasibility Phase Study to modify the existing Wilmington Harbor project in the interest of navigation improvements.

However, section 905(b) of the Water Resources Development Act of 1986 says this:

Before initiating any feasibility study under subsection (a) of this section after the date of enactment of this Act, the Secretary shall first perform, at Federal expense, a reconnaissance study of the water resources problem in order to identify potential solutions to such problem in sufficient detail to enable the Secretary to determine whether or not planning to develop a project should proceed to the preparation of a feasibility report. Such reconnaissance study shall include a preliminary analysis of the Federal interest, costs, benefits, and environmental impacts of such project ...

The difference is that the law requires a study of a water resources problem and potential solutions and a determination of whether there is a “Federal” interest in a project to provide such solutions, while the Wilmington District purpose statement suggests determination of whether the Corps has an interest in a study. Therein lies the bias: a study would provide funds, approximately \$10 million in this case, for the staff of the Wilmington District to keep

busy for perhaps a decade. Of course the Corps has an interest. Whether there is a “Federal interest” in the project itself is another matter, which should be addressed in the analysis.

## 5.2. Problems and Opportunities

1) **Problem Identification** (page 5). The report identifies this problem:

- The existing authorized navigation project currently restricts vessel use to a smaller than desired class size due to insufficient channel depth. This limits opportunities to accommodate larger class vessels which are a growing percentage of the world fleet, and allows for economies of scale and transportation cost savings.

This statement is lacking in specificity and support. What is desired? By whom? What depth is insufficient? What is sufficient? Why is it necessary to accommodate larger vessels?

The report also identifies this problem:

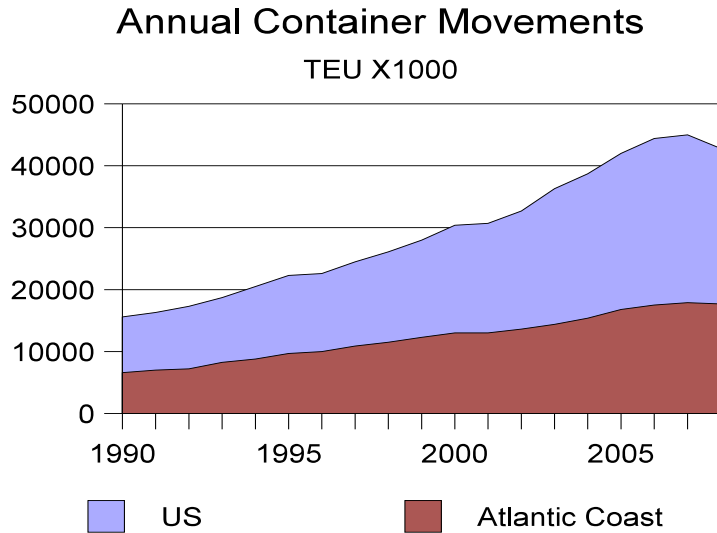
- Growth trends in container traffic indicate demand cannot be accommodated by the supply of existing facilities along the East Coast within the planning period (defined in Section 5.7). Lack of available facilities would result in inefficiencies in commodity movement as well as safety concerns resulting in increased transportation costs.

No support is offered for these statements. However, the first two paragraphs of the following section on opportunities appear to develop these points. This is the first:

A review of existing literature indicates a rapid growth of container trade since containerization was begun in 1980. This segment has been the fastest growing US trade for the last 30 years. Trade is growing at twice the rate of Gross Domestic Product (GDP). It is expected that this growth will continue, providing opportunities and requirements for additional container facilities throughout the US.<sup>1</sup>

The statements about past growth are undeniable, if unsupported. However, the rate of future growth is essential to the analysis of the need for additional facilities. The sole authority offered is a five-page article from Canada, and that is not specific as to growth rates. It would seem that the resources of the US Army Corps of Engineers would include analysis and forecast of future rate of growth of container traffic, given the number of dredging projects for container terminals under consideration nationwide.

Statistics on past movements are readily available from the American Association of Ports Authorities and from the Corps of Engineers. This graph shows national and Atlantic coast growth since 1990 (TEU means twenty-foot equivalent unit; in this case, that means annual movements of such units).



From 1990 through 2007, aggregate container traffic at US ports grew at a compound annual rate of 6.4%; for Atlantic coast ports, the rate was 6.1%. From 1990 through 2000, the rate of annual growth at Atlantic coast ports was 7.1%, but the rate for the next seven years dropped to 4.6%.

In 2008, most ports reported reduced movements; nationally, container traffic has reverted to the level prior to 2005. Little or no growth is expected when 2009 results are reported.

Container traffic has resumed growth in 2010. With continued growth, the 2004 level of container movements would again be reached by 2012.

This downturn, wholly unexpected, demonstrates the difficulty of predicting future growth. But that is the task at hand.

The second paragraph of section 5.2, subsection 2 says this;

Existing container facility capacity is rapidly being consumed and is growing much slower than container trade. This difference in growth rates is expected to soon lead to shortages of container facilities and capacity in many parts of the US. Container facilities will reach maximum capacity in the North Atlantic first followed by the West Coast, then the Gulf Coast, and finally the South Atlantic. This will require shifts in container movements as existing facilities reach capacity and are no longer able to expand their throughput.<sup>2</sup>

The issue of container terminal capacity, as related to future needs, is fundamental to the analysis. The authority offered by the Wilmington District is the 2008 report of CH2M Hill, Inc., consultants to the North Carolina State Ports Authority. It is not the work product of the Corps of Engineers, and has not been examined for validity. This is an issue that has been investigated by other analysts with different results.



Ports with container terminals on the Atlantic coast serving the southeast US market are at Hampton Roads (three terminals, a fourth planned), Wilmington, Charleston (two terminals, a third being developed, Savannah (one terminal, with another planned downriver at Jasper County, South Carolina), and Jacksonville. Morehead City, North Carolina, does not have container facilities.

The container terminals at Hampton Roads, Charleston, Savannah and Jacksonville have a combined capacity of approximately ten million TEU. That exceeds the current demand, which peaked at approximately 7.4 million TEU in 2007. Those ports have expansion projects underway to double capacity, to approximately 20 million TEU annually.

The table below shows the future capacity, as determined by CH2M Hill, Inc., and by Martin Associates, consultants to the North Carolina State Ports Authority and the ports industry:

Southeastern Terminal Capacity (TEU X1000)

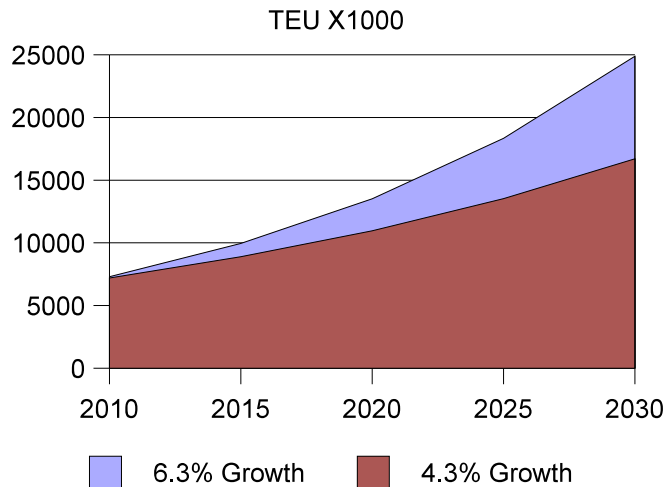
	<u>Current Capacity (CH2M Hill)</u>	<u>Future Capacity (CH2M Hill)</u>	<u>Potential Capacity (Martin Associates)</u>
Charleston	2.0	3.8	8.9
Hampton Roads	4.9	7.9	9.0
Jacksonville	0.9	1.7	2.3
Savannah	<u>2.4</u>	<u>6.5</u>	<u>6.6</u>
Total	10.2	19.9	26.8

This does not include the 500,000 TEU planned capacity at Wilmington or 1.5 million TEU that would be added at Jasper County, South Carolina, in a project in the planning stages.

The CH2M Hill, Inc., estimates of future capacity are based on projects now underway, and do not take into account productivity improvements. The Martin Associates estimates represent the potential capacity using productivity improvements that would increase the rate of lifts in the existing space. Such improvements, which are being implemented in Europe and Asia, include increased density of storage and techniques to increase velocity of movements, that is, to reduce the time containers are stored. Martin Associates has reported that with such improvements “Atlantic Coast ports will not likely become capacity constrained in the long-term.” We note that this statement was uttered in 2008, before the current downturn manifested itself.

This graph shows growth in container movements at south Atlantic terminals at 6.3% compound annual rate of growth, and at 4.3%. The higher rate, 6.3%, is the “base case” used by CH2M Hill, Inc., in its forecasts, an extrapolation of the national trend in the period immediately prior to the downturn in 2008. The lower rate, 4.3%, was used by CH2M Hill, Inc., as its low case, and represents container movements at East Coast ports and at the Port of Wilmington.

Growth in Container Movements



This table below shows the dates at which capacity of south Atlantic container terminals would be reached at various rates of growth, using the estimates of future capacity prepared by both CH2M Hill and Martin Associates:

	Current Capacity (CH2M Hill)	Future Capacity (CH2M Hill)	Potential Capacity (Martin Associates)
At 6.3% annual growth	2016	2027	2032
At 4.3% annual growth	2017	2034	2041

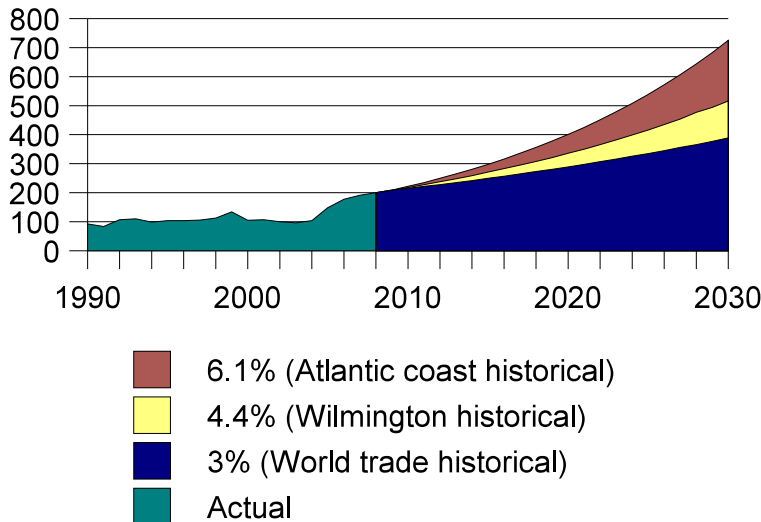
Addition of capacity at Jasper County, South Carolina, would extend each date another year.

These forecasts, prepared in 2008, disregard the current downturn. Container movements have reverted to 2004 levels, and are not expected to return to the peak of 2007 until 2011 or 2012. This effectively extends the time of capacity saturation for five years, to 2037 using the growth rate of 6.3%, and 2046 using 4.3%.

The only prudent conclusion would be that container terminal capacity in the South Atlantic region, existing and expected, is sufficient to meet demand for the foreseeable future.

We should also consider the container terminal at the Port of Wilmington. That has a capacity of approximately 350,000 TEU per year, and projects are underway to increase that to 500,000 TEU per year.

**Projected Annual Container Movements**  
TEU X1000



This graph shows past and projected container movements at the Port of Wilmington.

Container movements to 2004 remained at about 100,000 TEU per year, growing at an average annual rate of about 1%. In 2004, the opening of the channel to Wilmington at the deeper depth of 42 feet produced a sudden increase in container movements for three years, to about 200,000 TEU. This appears to have been a recapture of container movements lost to other ports with deeper channels. The compound annual rate of growth for the period 2000-2008 is 4.4%.

Going forward, the “base case” projection is continuation of the historical growth at 4.4% annual rate, assuming the transient effect of the channel deepening is just that—a transient effect. This graph also disregards the current downturn as another transient.

In case the container movements on the Atlantic coast resume their former vigorous growth of 6.1% annually, and container movements at the Cape Fear are carried along at the traditional market share, we use 6.1% as the “high case.”

If on the other hand container movements adopt the growth rate of a mature freight medium, we use as the “low case” 3%, the annual rate of growth of all seaborne freight from 1975 to 2006, as reported by the Institute for Shipping Economics and Logistics.

The base case yields 515,000 TEU in 2030, approximately the planned capacity of the container terminal at the Port of Wilmington. The high case, about 200,000 TEU more, could also be handled at Wilmington in the available space with adoption of container handling technology now coming into use at various ports.



Thus the container terminal at the Port of Wilmington is quite adequate for the container movements reasonably anticipated for the foreseeable future.

The result of all of this is that there is not any capacity problem in either the Cape Fear River or the Southeast region. Increasing container handling capacity at the Cape Fear River would be a solution without a problem.

**2) Opportunities** (page 5). The Wilmington District report states that : “Opportunity also exists to deepen the Cape Fear River channel to accommodate larger container vessels.” There is substantial doubt about this premise. The existing channel is now maintained at the depth of 42 feet, the result of a current project. The channel was opened at that depth in 2004. Accommodating the vessels proposed to be accommodated by the North Carolina State Ports Authority at a new terminal involves an additional eight to ten feet of depth. The State Ports Authority proposes 52.5 feet, the Wilmington District of the Corps 50 or 48 feet. In any case, these problems emerge when such depths are considered for the Cape Fear River:

- Investigation of the geology underlying the Cape Fear River by CH2M Hill, Inc., showed that rock would be encountered at the depths contemplated in several parts of the existing channel and in the new access channel needed for the proposed terminal. Removal of rock is substantially more expensive than removal of softer materials.
- The Castle Hayne aquifer underlies the Cape Fear River. Test wells on subsurface topographical maps of the United States Geologic Survey show the depth of that aquifer at 43 feet at the terminal site. Dredging in that area would penetrate the aquifer over a large area.
- The continental shelf at the mouth of the Cape Fear River falls off only gradually. Reaching water deep enough for the vessel drafts contemplated by the project requires extending the channel eight to ten miles, depending on the depth selected .
- The existing channel has turns in the vicinity of Southport (Lower Swash, Battery Island Channel, and Southport Channel) that do not conform to the Corps of Engineers design parameters set forth in Engineering Manual 1110-2-1613. Ship simulation tests conducted in 1999 show that Panamax vessels, with overall length of 960 feet and beam of 106 feet, cannot navigate the turns without leaving the marked channel. CH2M Hill, Inc., has determined that turns conforming to the manual for vessels of 1260-foot length and 160-foot beam cannot be fit between the banks of the river in this area.
- The depth and width of the channel at the river mouth has caused substantial problems of beach erosion due to the “sediment” sink” created by the channel, which captures sand normally moving along the shore. This has been recognized by plans for additional studies. A deeper, wider channel would only exacerbate that problem.

- Three Civil War era shipwrecks, including the *CSS North Carolina*, one of two ironclads built at Wilmington, lie along the channel in the vicinity of Southport. Other wrecks of archeological significance, and the remains of the quarantine station built in 1895, lie along the channel. Widening and deepening the channel in that area would require investigation of those sites, and disinterment and preservation of those artifacts.

When compared with other ports in the region, particularly Hampton Roads with a depth of 50 feet, the Cape Fear River is a poor candidate for further deepening.

## **INVENTORY**

The second step specified in the Corps of Engineers *Principles and Guidelines for Water and Related Land Resources Implementation Studies* is an inventory and forecast of conditions. The Wilmington District report does not do that. Not at all. There is no foundation for the assumptions and conclusions. After addressing the first step, specifying problems and opportunities, in a cursory fashion, the orderly analytical process laid out in the *Principles and Guidelines* is abandoned altogether.

### **5.5 Planning Criteria (page 6)**

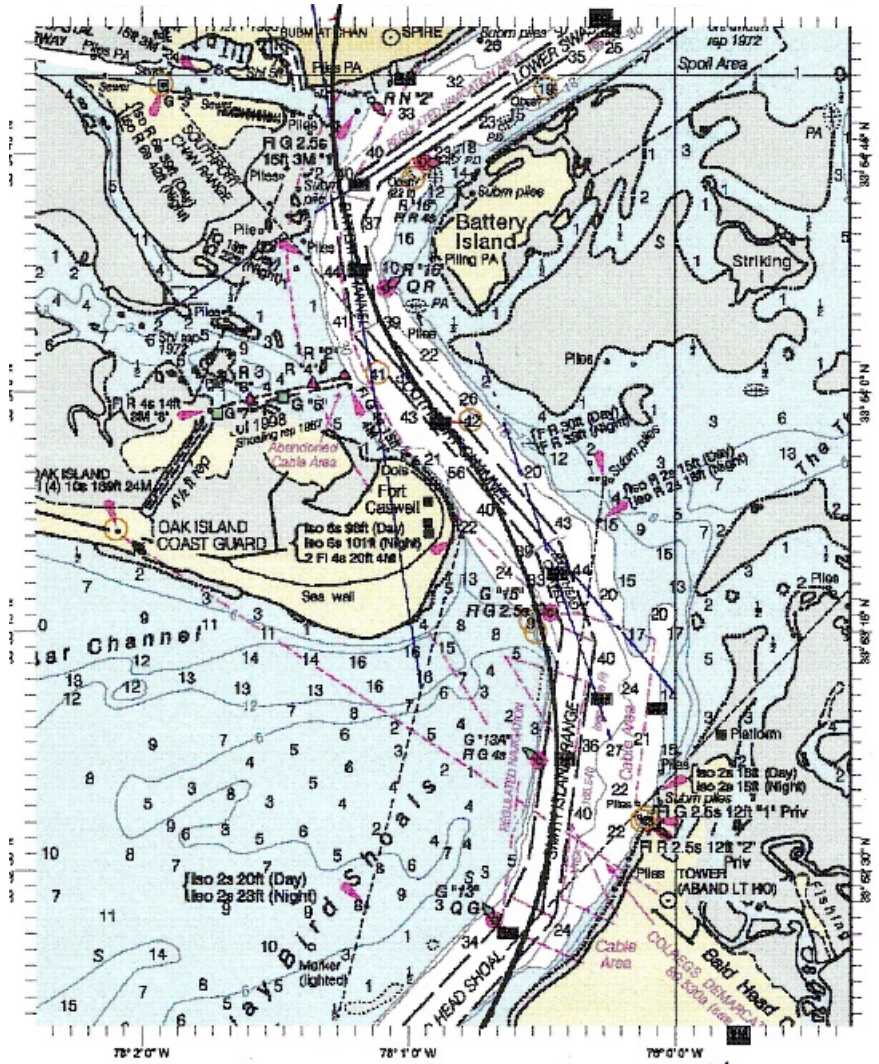
The planning criteria identified by the Wilmington District represents the preoccupation with economic goals and disregard of environmental aspects that has been condemned by Congress in the Water Resources Development Act of 2007. Environmental issues are considered in this report only to the extent legal prohibitions are avoided. A full consideration of environmental effects for their own sake, the approach recommended by the White House Council on Environmental Quality in revising the principles and standards for water resources projects in line with Congressional objectives, has not been attempted by the Wilmington District.

#### **5.6.2 Channel Depth and Dimensions (pages 9 and 10).**

Two channel turns in the Cape Fear River near Southport involve a combined deflection of 95 degrees. The Corps of Engineers Engineering Manual, EM 1110-2-1613, requires a radius of at least ten times vessel length for such turns. The existing channel turns have a combined radius of approximately three times vessel length. A ship simulator study conducted in 1999 showed that the design vessel of 950-foot overall length and 106-foot beam cannot navigate those turns without leaving the marked channel.

This chart shows the existing channel. The dark line is a hypothetical channel alignment conforming to the manual as to turn radius for Panamax vessels of 960-foot overall length. However, this line does not include the straight transition between reverse turns specified by the Corps manual.

The Wilmington District proposes to make the same mistake again. The report proposes widening the channel turns and changing the configuration to again provide a turn radius of three times the design vessel length. The design vessel in this case is 1260 feet long. Perhaps such a channel turn would fit between the banks of the river, but it would violate the criteria of the Corps engineering manual and every statement of good practice in this regard.



Such a decision would sacrifice safety for expediency on a huge scale, and be nothing less than reckless.

### 5.7.1 Economic Considerations (page 11)

#### *Benefits*

The Wilmington District identifies and measures one class of benefits of the channel and the related container terminal. The channel improvements alone would not produce any benefit.

The benefits identified are the transportation cost savings attributable to the use of larger vessels for container movements, with resulting economies of scale. There are two problems with this:

- This disregards the existence of ports with container terminals to the immediate north and south of the Cape Fear River—the three terminals (and a planned fourth) at Hampton Roads, where the harbor is 50 feet deep, and the two terminals (and a third under development) at Charleston Harbor, where the depth is 45 feet and plans are under way to increase that. All have excess capacity, and will have excess capacity for the foreseeable future. The overland distance from Charleston to Charlotte is about the same as the distance from Wilmington, and the overland distance from Hampton Roads to the Winston-Salem–Greensboro area is about the same as the distance from Wilmington. In both cases, the distance from Southport, where the proposed terminal is to be located, would be greater. The proposed terminal would be fifteen miles closer to Raleigh than the nearest other port at Hampton Roads, so the proposed terminal would offer an advantage for containers moving to that market. By comparison to the base case, that is, doing nothing and letting the container traffic in larger vessels move through other ports, the only benefit of a new terminal at the Cape Fear would be the cost savings in land transportation to the Raleigh area and points east.
- Any savings in marine transportation costs would accrue to the operator of the vessel. All container ships in international service are foreign-registered and owned. International shipping enjoys an immunity from antitrust laws; shipping lines may agree on rates, and they do. For example, there is a rate conference that sets the rates for the Asia-US trade: the Transpacific Stabilization Agreement. There is no assurance that any savings in marine transportation costs would be passed through to benefit National economic development in the United States.

The savings in overland transportation to the Raleigh market would be the cost of truck operation, approximately \$1.80 per mile, times the distance saved, 15 miles, for each container. That is \$27 per container. The typical container is 40 feet, or two TEU, so the savings would be approximately \$13.50 per TEU for each container attributable to the Raleigh market.

There would also be two negative effects, or “disbenefits,” disregarded by the Wilmington District:

- The proposed terminal at Southport would be about 20 miles farther from container origins and destinations than the terminal at Wilmington. Overland transportation is more expensive, on the basis of ton-miles or TEUs, than marine transportation. So shortening the voyage and lengthening the land leg results in a disbenefit.
- Because the largest container ships could not safely navigate the channel turns, tugboat assistance would be required. Since tugboat assistance would be required for docking and undocking, this is only an additional hourly cost. Based on Moran’s current rates, that would be about \$8400 per vessel call.

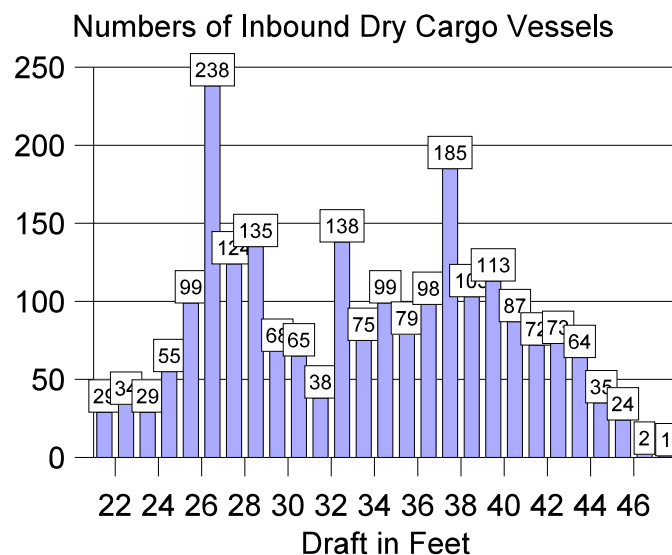
In calculating the benefits, the Wilmington District makes two assumptions: that 75% of the container movements would be in vessels of a size yielding economies of scale of 30% in transportation costs, and that the container movements would start at 1,000,000 TEU per year at the commencement of terminal operations, growing to 3,000,000 TEU per year by 2030. Both assumptions are faulty.

We can examine the size composition of the existing container vessel traffic by looking at recent vessel calls at Long Beach, California. That is the largest container terminal in North America. The harbor at San Pedro Bay is deep, accessible by the largest vessels. Thus the size of vessels calling at Long Beach is driven by market and operational considerations rather than draft restrictions.

This graph shows the number of dry cargo vessels of various drafts (in feet) calling at Long Beach in 2006, the last year the data are available from the Corps of Engineers.

A total of 2338 dry cargo foreign vessels called at Long Beach in 2006. Of those, 271, about 12%, drew more than 40 feet. Although not weighted for capacity, this graph shows that the very large container ships for which the subject project is designed constitute a quite small proportion of the world’s container ship fleet.

**Long Beach Vessel Calls and Drafts**



The size composition of the world's vessel fleet in future years involves a certain amount of speculation. Some prophets predict large-scale conversion to the largest vessels, while others point out the need for flexibility in operations, most obvious in the recent traffic downturn, would mandate a range of vessel sizes in liner operations.

Some indication of the near future can be obtained from this table obtained from Dynamar, B.V., a Dutch company that provides credit and marketing reports in the maritime sector, providing an estimate of the numbers of vessels of various sizes in 2015:

2015 (basis 2008 fleet & orderbook)	Operated fleet			
	TEU Share	Ships	Ø TEU	Total TEU
NewPostPanamax	4%	52	13,550	705,000
NewPanamax	8%	116	12,900	1,500,000
Smaller	88%	5,805	2,900	16,774,000
<b>Total ships</b>	<b>100%</b>	<b>5,973</b>	<b>3,200</b>	<b>18,979,000</b>

This table was prepared in 2008, before the growth in the size and numbers of container vessels came to an abrupt halt. Orders for new vessels have been canceled and existing vessels, large and small, have been taken out of service temporarily or permanently. The composition of the container vessel fleet in future years cannot be estimated with any certainty at this time. This chart does, however, show that very large ships of the size intended to be accommodated at the proposed container terminal (and for which the new channel would be needed) would constitute a relatively small proportion of the world's container vessel fleet in even the most optimistic circumstances.

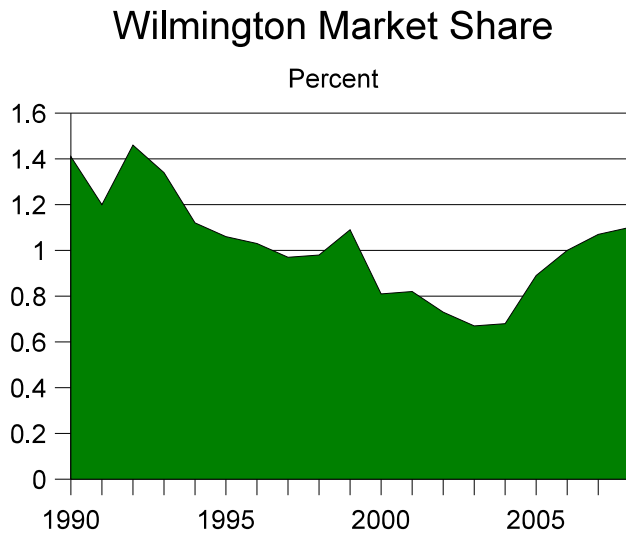
### *Container Movement Forecasts*

The Wilmington District relies on the CH2M Hill, Inc., forecasts of container movements prepared for the North Carolina State Ports Authority and delivered in March 2008. The District did not inquire as to the validity of those forecasts, but does point out that the forecasts are based on a market share of 3% of East Coast container traffic, growing to 6.75% in 2030.

For market share, we should look to experience at the Port of Wilmington. The proposed container terminal at Southport would service the same market, which is dictated by geography. The distance to markets, and the availability of adequate highways and railroad service, is the distinguishing characteristic of container terminals and the determinant of market share. If anything, the proposed terminal at Southport, 20 miles farther from markets than Wilmington, would be at a further disadvantage.



This graph shows the Port of Wilmington's share of the Atlantic coast container traffic in recent years:



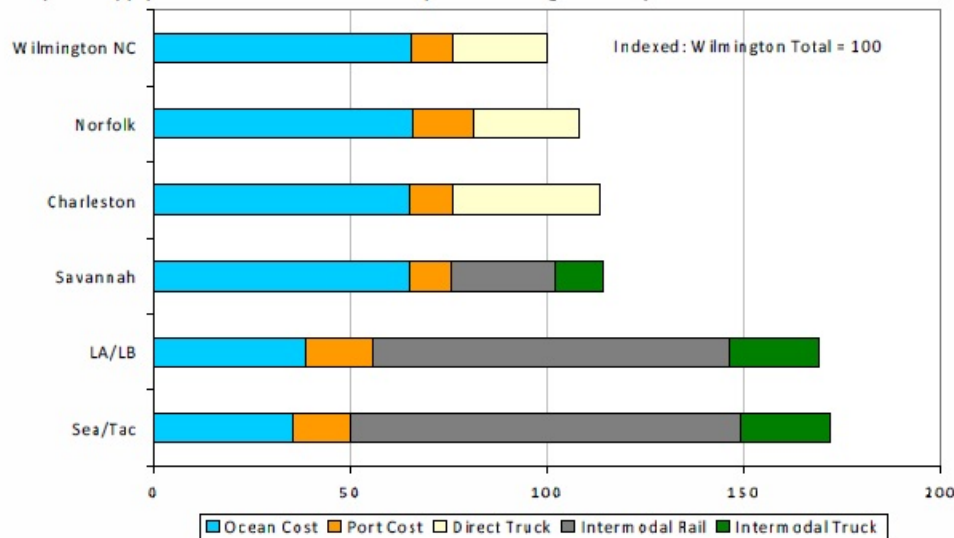
Container traffic, once at a level near 1.4% of Atlantic coast traffic, dropped steadily as vessel size increased, reflecting the disadvantage of the shallower channel depth in the Cape Fear River, 38 feet, that prevailed before 2004. In that year, the channel was opened at a new depth of 42 feet, and the port was accessible to the largest vessels able to navigate the Panama Canal. There was an immediate increase in market share.

Market share has not quite reached its former level, and has reached a sort of equilibrium at 1.1 %.

The issue of market share was addressed by another consultant to the State Ports Authority, Moffatt & Nichol, in a report delivered in February 2010 for a bond issue.

Moffatt & Nichol undertook a thorough inquiry as to just what is the market for the Port of Wilmington. The firm established, for the 179 Business Economic Areas (BEAs) in the United States, the supply chain costs for all possible ports of entry and exit for 16 regional trade lanes. Each supply chain cost included all components—ocean freight, port fees, trucking costs, and costs of intermodal rail, if the movement involved rail. This is an example, for the Raleigh Business Economic Area:

Example – Supply Chain Costs of North Asia Imports to Raleigh: Directly Service



The example shows that Wilmington is the least-cost port for Raleigh. Moffatt & Nichol determined that the Port of Wilmington was in the least-cost supply chain only for Raleigh and four other areas of the United States, all within North Carolina. The State Ports Authority confirmed that 100% of existing container traffic through the Port of Wilmington originated in or was destined for North Carolina.

Moffatt & Nichol further observed that capacity increases at other ports in the region would decrease Wilmington’s share of total container throughput capacity in the Southeast, and concluded that Wilmington’s market would remain within North Carolina. The Port of Wilmington’s opportunity for additional container traffic would have to come from increasing market share within North Carolina.

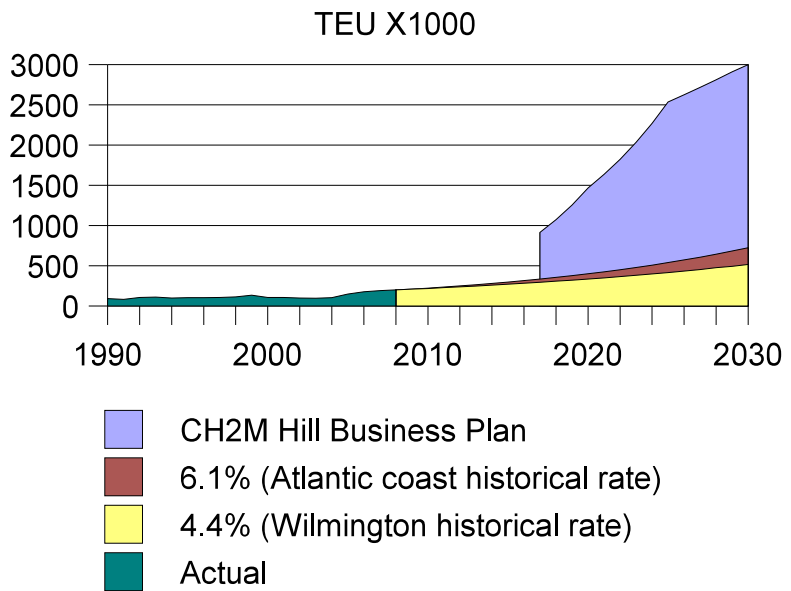
We note, however, that the Port of Wilmington already offers substantially lower rates than other container ports in the region and has the benefit of a credit against North Carolina income taxes for its customers. This leaves little opportunity to increase market share.

The graph on page 8 shows a projection of traffic at the Port of Wilmington at several rates of growth. Using 4.4% compound annual growth rate, the historical rate, the projection goes to 515,000 TEU per year in year 2030. Assuming the proposed terminal would replace the container terminal at Wilmington, that figure would also be applicable to the proposed container terminal. Nothing is different about the market for container movements for the two locations, except the proposed new terminal would be 20 miles farther from markets.

This graph shows the same projections, but includes the CH2M Hill, Inc. forecast for comparison (the vertical scale has been compressed to accommodate the CH2M Hill figures).

By comparison with the projections of the historical trend, the CH2M Hill, Inc., projection of container movements for the proposed North Carolina International Terminal is so high as to suggest grievous analytical error. The CH2M Hill, Inc., projection for the year 2030 is 3,000,000 TEU annually; normal growth of the Wilmington market suggests

Projected Annual Container Movements





annual movements of about 500,000 TEU, plus or minus 200,000 TEU. CH2M Hill, Inc., in its *Pro Forma Business Plan*, does use the word “could” to qualify its statement.

The CH2M Hill, Inc., forecast must be considered wholly implausible. We note, as did the Wilmington District in its report, that the forecast is based on increasing market share to 6.75% from the current 1.1%. Moffatt & Nichol, in its later report, found that any increase in market share is unlikely.

The analysis of benefits must be based on aggregate container traffic in 2030 of approximately 500,000 TEU per year. Of that, only about 12% would be carried in the larger vessels providing economies of scale. Any higher figures would be speculative and insufficient basis for conclusions as to feasibility.

### *A Relevant Legal Restriction*

In a quest for benefits contributing to National economic development, the analyst must have a National perspective. Benefits to one port or one region cannot be counted if they are simply transferred from another port or region. There would not be a net gain to the Nation.

This is recognized in section 904 of the Water Resources Development Act of 1986, which prohibits counting benefits “involving the transfer of economic activity ... from other regions.” The full section, as amended, is codified at 33 USC §2281:

#### § 2281. Matters to be addressed in planning

##### (a) In general

Enhancing national economic development (including benefits to particular regions of the Nation not involving the transfer of economic activity to such regions from other regions), the quality of the total environment (including preservation and enhancement of the environment), the well-being of the people of the United States, the prevention of loss of life, and the preservation of cultural and historical values shall be addressed in the formulation and evaluation of water resources projects to be carried out by the Secretary, and the associated benefits and costs, both quantifiable and unquantifiable, and information regarding potential loss of human life that may be associated with flooding and coastal storm events, shall be displayed in the benefits and costs of such projects.

So “captured” market share from other container terminals, the basis of the CH2M Hill, Inc., *pro forma* business plan and the Wilmington District benefit calculations, is not a legitimate element of benefits. The only market share eligible is that which would be moved downriver from Wilmington and could and would be carried in larger vessels.

## *Costs*

CH2M Hill, Inc., in its estimates for the North Carolina State Ports Authority, estimates the cost of the proposed container terminal and its land-side infrastructure at approximately \$1.85 billion. The navigation improvements cannot generate benefits without the terminal and that infrastructure. In a benefit/cost analysis, all of the costs of the system generating the benefits must be included for proper comparison. So the \$1.85 billion must be included in the costs that are compared to the benefits.

The Wilmington District, in its report, does not include the cost of the terminal and landside infrastructure because those costs are assumed to be self-liquidated by terminal revenues. We note, however, that such self-liquidation would flow from a business plan that depends on the container movements representing a market share of 6.75% of Atlantic coast container traffic, which we have found to be implausible and even if plausible, represent transfers from other ports which cannot be counted. We also note that no container terminal in the United States can recover capital costs from revenues. The Port of Wilmington does not; all capital costs are contributed by the State legislature. One terminal that was constructed in the hope of providing an investment return, the AP Moller terminal in Portsmouth, Virginia, has not been successful and its owners seek to transfer the terminal to the Virginia Ports Authority.

We can, however, assume that operating costs would be self-liquidating from revenues, based on experience at the North Carolina State Ports Authority and at other operating entities.

## *Benefit/Cost Comparison*

Using the Wilmington District's cost estimates for the 50' depth, and adding in the terminal and the landside infrastructure, we have these costs:

Terminal and infrastructure	\$1,850,000,000
Channel improvements	1,200,000,000
Total	3,050,000,000
Amortized as annual costs at 4.375%	152,000,000
Annual maintenance costs	4,500,000
Aggregate annual costs	\$ 156,500,000

These are the annual benefits (and disbenefits):

Land transportation savings (61,800 TEU X \$13.50)	\$ 830,000
Tugboat assist (100 vessel calls X \$8400)	( 840,000)
Net annual benefits (negative)	\$ ( 10,000)

This disregards the disbenefit of longer land distances relative to the Port of Wilmington, net of marine transportation savings from the shorter distance by water.

The project would have an annual cost of \$156,500,000. Benefits would be negative and too small to consider.

## **6. FEDERAL INTEREST** (page 17).

This section should respond to the Congressional mandate “to identify potential solutions to such problem in sufficient detail to enable the Secretary to determine whether or not planning to develop a project should proceed to the preparation of a feasibility report. Such reconnaissance study shall include a preliminary analysis of the Federal interest, costs, benefits, and environmental impacts of such project ... .”

A definition of the “Federal interest” and an investigation of the relationship of the selected project to the elements of that interest would be necessary to determine whether the project is in the Federal interest. Then the costs, benefits and environmental impacts should be summarized for a conclusion as to whether the project should proceed. All elements are necessary. We note that the annual costs are estimated at \$156,000,000, there are no net benefits, and there are substantial potential environmental effects and all are negative. The conclusion can only be that the project should not proceed to the preparation of a feasibility study.