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September 7, 2010

MEMORANDUM FOR THE ENGINEER INSPECTOR GENERAL

Complaint dated April 19, 2010, regarding Wilmington District section 905(b) analysis  
Proposed North Carolina International Terminal

On April 19, 2010, the undersigned, Albert H. Willis, USAF Colonel (Retired), submitted by e-mail to the office of Engineer Inspector General a complaint regarding a section 905(b) analysis prepared by the Wilmington District, South Atlantic Division, for the proposed North Carolina International Terminal. The complaint states that the benefit/cost calculations incorporated in the section 905(b) analysis include benefits from economic activity transferred from other regions, which is prohibited by section 904 of the Water Resources Development Act of 1986.

The Section 905(b) Analysis

The Wilmington District of the Corps of Engineers has prepared a document entitled "Section 905(b) Analysis, Wilmington Harbor Navigation Improvement Project, North Carolina International Terminal," as part of a reconnaissance study under section 905(b) of the Water Resources Development Act of 1986. The section 905(b) analysis has not been released, despite Corps of Engineers Planning Guidance, a request by Congressman Mike McIntyre, and a Presidential directive to the contrary. A draft dated February 2010 has been provided to the North Carolina Department of Environment and Natural Resources, where it became subject to discovery under the North Carolina Public Records law.

The section 905(b) analysis includes this conclusion:

6. FEDERAL INTEREST

Because transportation savings for waterborne commerce is a high-priority project purpose for the Corps of Engineers and because transportation savings in the form of National Economic Development Benefits (NED) appear to exceed the cost of project implementation, there is a strong Federal interest in conducting the feasibility study of navigation improvements at Wilmington Harbor. Based on the preliminary analysis, there appears to be potential project alternatives that would be consistent with Army policies, costs, benefits, and environmental impacts.<sup>1</sup>

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1. This passage reveals the fundamental flaw in the analysis. While section 905(b) of the Water Resources Development Act of 1986 requires a "preliminary analysis of the Federal interest, costs, benefits, and environmental impacts of such *project* ...," the Wilmington District's analysis focuses on an interest in a *study*. See James Crew, Kevin Horn & Richard Schultz, *National Economic Development Procedures Manual, Deep Draft Navigation*, IWR Report 91-R-13 (1991) at page 7.

The project subject of the section 905(b) analysis is a new container terminal on the Cape Fear River in North Carolina, approximately four miles from the mouth of the river. The project would require substantial dredging, including a new channel to the terminal site, a turning basin, deepening the existing channel to 50 feet, substantially reconfiguring certain channel turns, widening the channel to 640 feet, and extending it to deep water 17 miles offshore. The Wilmington District estimated that channel improvements would cost \$1.2 billion. Average annual costs of the channel improvements would be \$64,400,000. The terminal itself and land-side infrastructure would cost another \$1.8 billion, according to estimates of consultants to the North Carolina State Ports Authority

There is a container terminal at the Port of Wilmington, 22 miles upriver from the site of the proposed new terminal. The channel to Wilmington is maintained at a depth of 42 feet, sufficient for Panamax vessels, that is, the largest vessels able to transit the Panama Canal.

The calculation of benefits in the section 905(b) analysis is based on economies of scale from using post-Panamax container ships, that is, ships larger than Panamax, at the new terminal. Such ships would be able to transit the Panama Canal after improvements scheduled for 2014 are completed.

The calculation includes these stated assumptions:

- Average savings of \$85 per twenty-foot equivalent unit (TEU) of containers from using post-Panamax vessels. The size of such vessels is not specified, and authority for such savings is not provided.
- 75% of container traffic at the new terminal would be carried in Post-Panamax vessels. No authority is provided for this mix of vessel sizes.
- The new terminal would handle 1,000,000 TEU in the first year of operation, 2020, and that would grow to 3,000,000 TEU by year 2030.

The analysis does not define the “without” condition and disregards alternatives. Studies of projects for container terminals in other areas recognize the availability of alternate ports with deepwater harbors. In such studies, container traffic would move through other ports capable of accommodating post-Panamax vessels and the benefits of the project would be limited to savings in cost of land transportation for any traffic diverted to the new project by reason of such savings. See Kevin Knight, *The Implications of Panama Canal Expansion to U.S. Ports and Coastal Navigation Economic Analysis* (IWR 2008) at page 10.

The assumption of 1,000,000 TEU growing to 3,000,000 TEU is based on the report *Pro Forma Business Plan, North Carolina International Terminal*, prepared by CH2M Hill, Inc., for the North Carolina State Ports Authority. Those figures are based on “capture” of container traffic from other ports.

## Section 904 of the Water Resources Development Act of 1986

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.

This explanation by an unnamed subject-matter expert in the Civil Works Directorate of the Corps headquarters has been included in a letter dated August 17, 2010, from Robert N. Jones, Chief Assistance and Investigations Division, to the complainant:

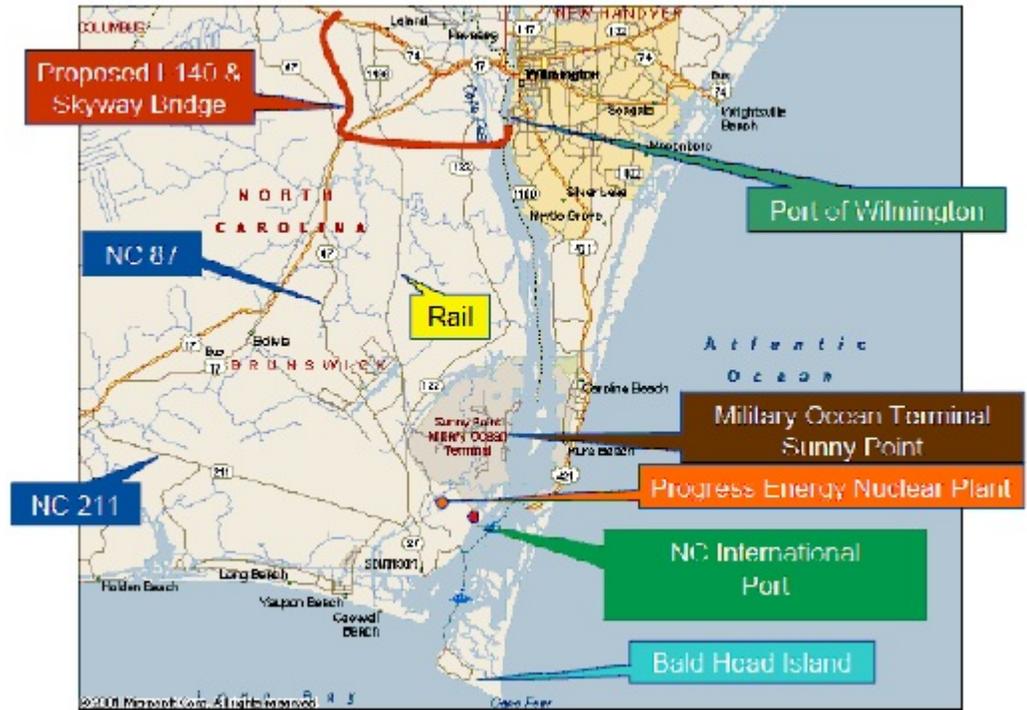
Thus when commerce shifts from one port to another, it is regarded as a transfer of economic activity if the shift does not increase or absorb resources or output. Where commerce shifts due to a reduction in the cost of delivering a good to market, this would not be considered a transfer of economic activity. Net reductions in the cost of moving goods result in increases in national resources available for other purposes (i.e. increase output) and thus are considered national benefits. The reconnaissance report makes only a preliminary assessment of economic benefits. The definitive assessment of economic benefits will be accomplished in a feasibility report. It is appropriate for the Corps planning studies to evaluate shifts in commerce from one port to another when they are the result of reduction in delivered costs. These reductions in delivered costs are not economic transfers and are included as benefits in the National Economic Development account.

## The Transfer of Economic Activity

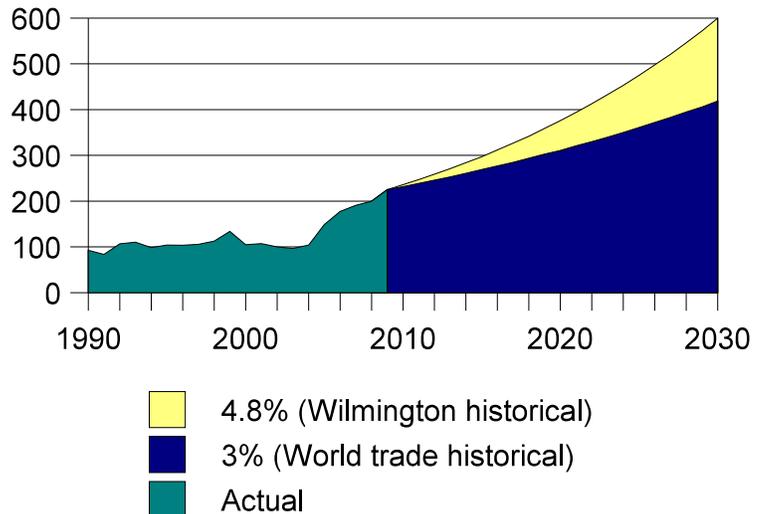
The proposed new container terminal is 22 miles downriver from the container terminal at the Port of Wilmington. The proposed new terminal would be connected to the same highway system at nearly the same point, and would be served by the same railroad. Thus the proposed new terminal would serve the same shippers in the same markets with the

same land-side infrastructure and the same location in the shipping lanes as the terminal at the Port of Wilmington. The Port of Wilmington enjoys parity with other terminals in the Southeast in that the 42-foot channel in the Cape Fear River can accommodate Panamax vessels. These circumstances define the relationship of the lower Cape Fear River to other U.S. Atlantic coast harbors in the market for container shipping, and permit use of the container traffic history at the Port of Wilmington to forecast the combined container traffic at the Port of Wilmington and the proposed new terminal.

In the period 1990-2009, container traffic at the Port of Wilmington grew at a compound annual rate of 4.8%, reaching 225,000 TEU in calendar year 2009. This represents approximately 1.4% of the U.S. Atlantic coast container movements. Extrapolating that history at the same rate of growth would yield 600,000 TEU in the year 2030.

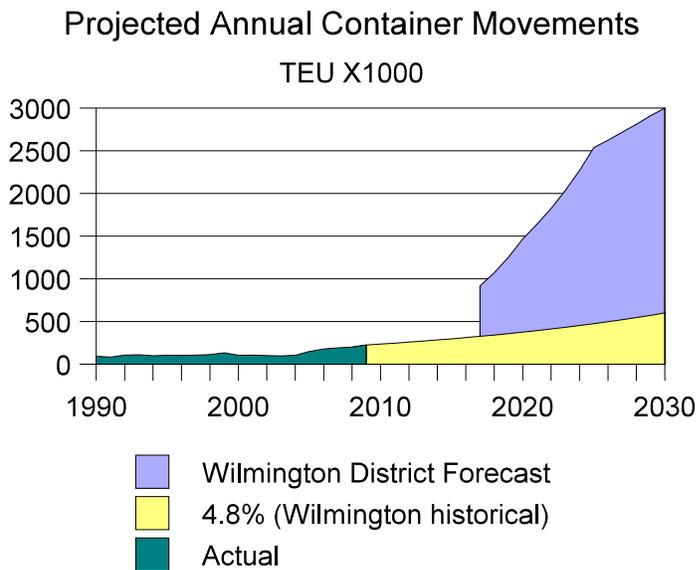


Projected Annual Container Movements  
TEU X1000



In its section 905(b) analysis, the Wilmington District of the Corps of Engineers did not prepare a forecast of container movements based on historical trends, but instead used a forecast of 3,000,000 TEU for the proposed new terminal in the year 2030— approximately five times the container traffic to be expected from continuation of normal growth in the terminal’s market, and 6.75% of the U.S. Atlantic coast container movements anticipated for that year, assuming a robust 6.3% compound annual growth rate from 2008.

The traffic forecast used by the Wilmington District and a forecast of normal growth are shown in this graph:



The forecast used by the Wilmington District in its analysis was taken from the *Pro Forma Business Plan* prepared by CH2M Hill, Inc., for the North Carolina State Ports Authority and delivered in 2008. The business plan is based on “capture” of market share from other U.S. East coast container terminals. See pages 2, 5, 6, 12, Appendix A, pages 3, 13, 26, and 69. Indeed, only by such “capture” can market share be increased from 1.4% to 6.75%.

This is a *prima facie* case for using benefits “involving transfer of economic activity to such regions from other regions” which is proscribed by section 904 of the Water Resources Development Act of 1986. It remains to be determined whether the capture of container movements from other ports is due to a reduction in the cost of delivering a good to market, which the headquarters advice would permit as constituting a net reduction in the cost of moving goods and an increase in national resources available for other purposes.

If the shift in container movements from other U.S. East coast ports were the result of a unique cost advantage for the proposed terminal on the Cape Fear River, such as a deeper channel permitting the use of larger vessels, then to the extent of any such cost advantages such shift would be a valid basis for calculating benefits. But that is not the case. The CH2M Hill, Inc. business plan, as set forth in section 2.2 thereof (pages 4, 13), is based on six points:

1. Deep water, to equal channel depths existing or planned for other ports.
2. Railroad access to hinterland markets, as now exists at other ports.
3. Good highway access, as now exists at other ports.

4. High productivity facilities to equal those at other ports..
5. State of the art facility, to provide efficiency equal to other ports.
6. Competitive pricing of service.

The consistent theme of all six points is parity with other ports, in most cases to equal situations now prevailing at those ports. No actual advantages are alleged. Indeed, it is something of a mystery as to how CH2M Hill, Inc., expects the market share to be increased by a factor of five only by achieving the same parity in the future that exists today.

CH2M Hill, Inc., did look for advantages in distance of container movements through the proposed terminal compared to others. The firm examined the relative distances by ship to the terminal and to its south Atlantic competitors. These are the findings:

- Compared to the terminals at Hampton Roads in Virginia, the proposed North Carolina International Terminal would offer an advantage of about eight hours in sailing time from the Panama Canal, and would be at a 12-hour disadvantage in sailing time from Europe and the Suez Canal.
- Compared to the terminals to the south, Charleston, Savannah, and Jacksonville, the North Carolina International Terminal would have a few hours sailing time disadvantage with respect to the Panama Canal, but would be closer to Europe and the Suez Canal by about eight hours, more or less.

CH2M Hill, Inc., also examined the distances from the various terminals to markets by road and by rail. These are the findings:

- Compared to the other terminals, the distance by road from the North Carolina International Terminal is shorter to Raleigh, but other terminals are closer by road to other northern, southern, and Midwestern destinations. Even Winston-Salem is closer by road to Hampton Roads in Virginia. The terminal at Charleston is closer to Charlotte, Charleston and Savannah are closer to Atlanta, and Hampton Roads is closer to the markets in the Midwest.
- Compared to the other terminals, the distance by rail from the North Carolina International Terminal is shorter to North Carolina destinations, but other terminals are closer to other northern, southern, and Midwestern destinations. Rail distances usually are considered relevant only for movements more than 400 miles.

Not noted by CH2M Hill, Inc., in their report is the lack of service to the North Carolina International Terminal by Norfolk Southern Railway Company, the competitor of

CSX Transportation, Inc., in the East. Both railroads have extensive networks throughout the East and Midwest, and connections to the western roads. The rail connection from the North Carolina Terminal would be to CSXT at Leland. All other terminals in the Southeast are served by both CSXT and Norfolk Southern. Although interchange of traffic from CSXT to Norfolk Southern is possible, the element of competition to assure the best rates and service for the North Carolina International Terminal would be missing.

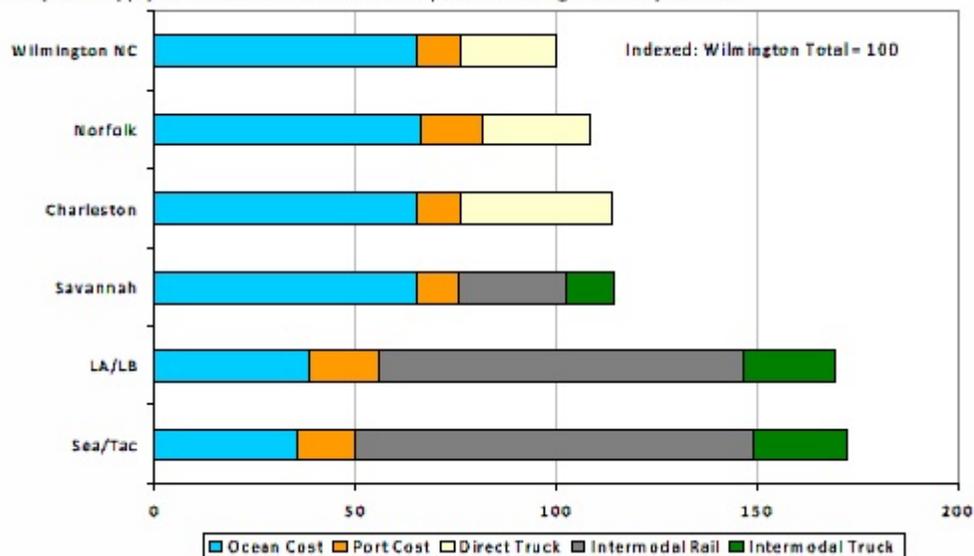
The incremental cost of a ton-mile by ship is less than that for rail, and the incremental cost for rail is less than that for truck. Thus the lowest cost route would have the shortest road or rail distance, even if the voyage is slightly longer.

Putting these elements together, the only market in which the North Carolina International Terminal would offer reductions in transportation costs, relative to out-of-state terminals, is eastern North Carolina, the traditional market served by the Port of Wilmington.

In February 2010, in connection with an issue of revenue bonds, the North Carolina State Ports Authority obtained a report from Moffatt & Nichol on the market prospects of the container terminal at Wilmington. This report was supplied to the Wilmington District, but not cited as a source in the section 905(b) analysis.

Moffatt & Nichol undertook a thorough inquiry as to just what is the market for the Port of Wilmington, using a “least cost market area” analysis to identify the areas served by the Port of Wilmington at the least cost. 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 within North Carolina. The State Ports Authority confirmed to Moffatt & Nichol 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.

For the proposed new container terminal downriver, even the market share of Wilmington may not be achieved. Distances to all markets from the proposed terminal would be about 20 miles longer over land than from the existing terminal at Wilmington.

Thus both CH2M Hill, Inc., and Moffatt & Nichol concluded that, given parity in facilities, a new container terminal on the Cape Fear River would offer no cost advantages to shippers over ports in neighboring states except in the limited area of North Carolina served by the existing facility.

If indeed any container traffic is captured from other ports, there would be no reduction in delivered costs of goods from such transfers of container movements from other ports, and thus no net gain for National Economic Development.

It can be expected that a workmanlike job of evaluating the "without" alternative would show that, without the deep dredging for the proposed container terminal to accommodate post-Panamax vessels, some of the container movements included in the growth forecast would instead migrate to ports in neighboring states with harbors sufficiently deep for such vessels.

Thus there would be a benefit attributable to savings in delivered costs for goods delivered to Wilmington/Southport least-cost market areas in North Carolina if those movements were retained by the proposed project. Those benefits would be the lesser of

(a) the economies of scale from the use of post-Panamax vessels for some portion of the container movements reasonably to be anticipated, that is, 600,000 TEU in 2030, and

(b) the savings in land transportation attributable to carriage of goods from ports in neighboring states that can accommodate post-Panamax vessels.

Inasmuch as most major North Carolina markets are as close or closer to such other ports, and Raleigh is only 15 miles closer to the proposed terminal at Southport than Hampton Roads, the land transportation savings would be the lesser benefit, and likely insubstantial.

## Conclusions

1. Section 904 of the Water Resources Development Act of 1986 prohibits the inclusion of “benefits to particular regions of the Nation .... involving the transfer of economic activity to such regions from other regions” in evaluating water resources projects.

2. The Wilmington District of the Corps of Engineers, in preparing an analysis of benefits pursuant to section 905(b) of the Water Resources Development Act of 1986 for the proposed North Carolina International Terminal, included benefits derived from container movements transferred from ports in other regions.

3. In its draft section 905(b) analysis, the Wilmington District does not allege or suggest that such transfer is attributable to or would result in any savings in transportation costs that would enhance National economic development *by reason of such transfer*. Circumstances presented in materials used by or available to the Wilmington District indicate that there would not be any such savings. There is no justification for including benefits transferred from other regions contrary to section 904 of the Water Resources Development Act of 1986.

Accordingly, the Wilmington District should be instructed to revise its section 905(b) analysis for the North Carolina International Terminal to include only such benefits as are attributable to transportation cost savings within the region served by the proposed terminal, and such benefits, if any, as are attributable to transportation cost savings for goods movements transferred from other regions by reason of costs savings not occurring or available in the transferring region, and then only to the extent of such savings due to such transfer.

Albert H. Willis

## Sources

CH2M Hill, Inc., *Pro Forma Business Plan*, North Carolina State Ports Authority (2008).

CH2M Hill, Inc., *Planning Assumptions*, North Carolina State Ports Authority (2008).

James Crew, Kevin Horn & Richard Schultz, *National Economic Development Procedures Manual, Deep Draft Navigation*, IWR Report 91-R-13 (1991) at page 7.

Kevin Knight, *The Implications of Panama Canal Expansion to U.S. Ports and Coastal Navigation Economic Analysis*, Institute for Water Resources ( 2008)

Moffatt & Nichol, *Ports of Wilmington & Morehead City Feasibility Study*, North Carolina State Ports Authority (2010).

United States Army Corps of Engineers, Wilmington District, *Section 905(b) Analysis, Wilmington Harbor Navigation Improvement Project, North Carolina International Terminal* (Draft, February 2010).