
SECTION V

RESOLUTION

GENERAL

This section evaluates the most important problems, needs, concerns, and opportunities based on the prioritized rankings presented in Section IV. The evaluations are accomplished in the order of the composite numeric rankings assigned by Circle "A" stakeholders and include preliminary estimates of costs, benefits, and potential impacts on port operation and development. Monetary values for costs and benefits are based primarily on available information supplemented by sufficient new data where required to support conclusions and recommendations for the specific concern being evaluated. The section also includes a discussion of the responsibility for implementing the necessary action to facilitate resolution of the concern, as well as cost-sharing implications. Following the evaluations, Section VI will incorporate the individual concerns into a long-range comprehensive planning strategy that provides for the most efficient development of the port's navigation features and ensures that these features effectively accommodate future use and growth.

LISTING OF CONCERNS TO BE EVALUATED

All of the concerns identified by stakeholders were described and prioritized in Section IV; however, only the most important concerns as prioritized by Circle "A" stakeholders are evaluated in this section. The following table lists the concerns that are discussed and evaluated in subsequent paragraphs.

Table V-1. PRIORITIZED CONCERNS SELECTED FOR EVALUATION

Concern	Priority ranking
Maintenance dredging: Continued and timely maintenance of port channels	1
Norfolk Harbor Channel: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet to Lamberts Point	2
Need to extend life of Craney Island Dredged Material Area and/or locate alternative future placement sites	3
Use of Craney Island Dredged Material Area for port development	4
Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to 50 feet to Lamberts Point	5
Elizabeth River Channel: Need to deepen from 40 feet to the authorized depth of 45 feet from Lamberts Point to the junction of the Eastern and Southern Branch Channels	6
Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to the authorized depth of 55 feet to Lamberts Point	7 (tie)
Funding	7 (tie)
Channel to Newport News: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet	9
Southern Branch Channel: Need to deepen from 40 feet to the authorized depth of 45 feet to the Norfolk Southern Railroad bridge	10 (tie)
Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 50 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated (1)	10 (tie)
Southern Branch Channel: Need to deepen from 35 feet to the authorized depth of 40 feet to the Gilmerton Bridge	12
Water quality	13

Table V-1. PRIORITIZED CONCERNS SELECTED FOR EVALUATION
(Cont'd)

Concern	Priority ranking
Channel to Newport News: Need to deepen the inbound lane from 50 feet to the authorized depth of 55 feet	14
Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 55 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated (1)	15
(1) Please see anchorage designations for (K-1), (K-2), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).	

CONCERN NUMBER 1

MAINTENANCE DREDGING: CONTINUED AND TIMELY MAINTENANCE OF PORT CHANNELS

DESCRIPTION

This concern relates to the need to ensure that the Corps of Engineers continues its program to provide maintenance dredging of the main Federal channels of the port at appropriate intervals to make sure that proper dimensions are available for efficient, effective, and safe navigation.

PROPOSED ACTION

Full authorized project dimensions are maintained within the harbor where feasible and justified. The maintenance of full project dimensions often requires advance maintenance dredging, which is the additional depth and/or width specified to be dredged beyond the project channel dimensions for the purpose of reducing overall maintenance costs by decreasing the frequency of dredging. In some of the Federally authorized

channels and anchorages, the current navigation needs are met by dredging the project channel or anchorage area to less than the authorized depth and/or width. Channel conditions are surveyed frequently to determine existing conditions, and necessary actions, including the scheduling of appropriate funding, are routinely accomplished by the Norfolk District Corps of Engineers.

PLAN ACCOMPLISHMENTS

Provision of appropriate maintenance dredging of channels, anchorages, and turning basins within the harbor permit the safe and efficient movement of vessels of all types into and out of the port. Vessels ranging from large bulk coal carriers, Navy ships, containerhips, commercial work boats, recreational craft, and others make daily use of the maintained channels. The maintained channels support substantial port industry and military activities, and they provide significant economic impacts to the Hampton Roads area, the region, and the nation as discussed in Section I.

ANALYSES

Valid economic analyses are accomplished periodically to determine the needs of using traffic and to ensure the continued justification of maintenance expenditures.

Costs

The Corps spends an average of \$7.0 million annually to maintenance dredge an annual average of 1.6 million cubic yards of material from navigation projects within the Hampton Roads area and related activities.

Benefits

Maintenance dredging of the waterways that comprise the Port of Hampton Roads benefits a wide range of port activity. All vessels utilizing the port received benefits from the channels, turning basins, and anchorage areas that are periodically maintained. In the absence of maintenance dredging, channels would shoal, resulting in vessel delays, increased transportation costs, vessel damage, and other hardships on the port's military,

industrial, commercial, and recreational interests. Appropriate maintenance dredging keeps the port running efficiently, effectively, and safely.

Environmental Impacts

Maintenance dredging efforts of the Corps of Engineers are governed by the environmental compliance requirements and procedures set forth in the Clean Water Act and other applicable Federal, state, and local environmental laws and regulations. Environmental analyses and documentation have been accomplished and will continue to be updated and kept current for all maintenance dredging activities within the Hampton Roads harbor area.

DIVISION OF PLAN RESPONSIBILITY

For the Federal projects that comprise the Port of Hampton Roads, the Corps of Engineers is responsible for appropriate and timely maintenance dredging. Local owners and operators are responsible for maintaining their access channels and berthing areas. In planning new navigation projects, the present policy is to require local interests to provide, without cost to the United States, all suitable areas required for initial and subsequent placement of dredged material. The WRDA 96 modified the WRDA 86 to include dredge material facilities (such as retaining dikes, bulkheads, and embankments) as part of the general navigation features of a project and cost shared between the Federal Government and the non-Federal sponsor on the same basis as other project features. Owing to great foresight, the port is very fortunate to have the Craney Island Dredged Material Area available where most of the material from maintenance dredging activities within the port is placed. Craney Island is an income-producing facility that receives funds from toll charges levied on non-Corps of Engineers users.

CONCLUSIONS

The Norfolk District Corps of Engineers does an excellent job in maintaining the many waterways that comprise the Port of Hampton Roads. Proper and timely maintenance dredging will continue into the future, depending upon appropriate and

timely funding and the continued availability of the Craney Island Dredged Material Area or a similar alternative placement area.

CONCERN NUMBER 2

NORFOLK HARBOR CHANNEL: NEED TO DEEPEN THE OUTBOUND LANE FROM 50 FEET TO THE AUTHORIZED DEPTH OF 55 FEET TO LAMBERTS POINT

DESCRIPTION

This concern expresses a need to deepen the elements of the outbound lane of the Norfolk Harbor Channel from their currently maintained depth of 50 feet to the authorized depth of 55 feet to Lamberts Point. The 55-foot outbound element is a separable element of the Norfolk Harbor and Channels project authorized by the WRDA 86. The concern, identified by stakeholders and prioritized by Circle "A" members, is related to improvements to outbound navigation on the southside of the Hampton Roads harbor.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the outbound channel element of the Norfolk Harbor Channel to 55 feet. As discussed in Section II, it would also require the dredging of the approach channels (the Atlantic Ocean Channel and the Thimble Shoal Channel), anchorages (Anchorage F and Sewells Point), and appropriate access channels and berthing areas. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 55-foot main channel depth. In addition, some wrecks would have to be cleared, a water main would have to be relocated or replaced, a tunnel cover would have to be constructed to protect the Chesapeake Bay Bridge-Tunnel, which runs under the Thimble Shoal Channel, and aids to navigation would have to be moved and/or installed.

Dredged material from the Corps of Engineers project would be placed in the Dam Neck Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process. Suitable material from the Thimble Shoal and Atlantic Ocean Channels would be considered for nourishing area beaches. During the PED phase, consideration would be given to placing dredged material in the Craney Island Dredged Material Area, which could result in a significant reduction in project cost.

PLAN ACCOMPLISHMENTS

Provision of the 55-foot-deep outbound channel elements would primarily serve the large bulk coal carriers departing the southside of the port with loaded drafts of 50 feet and greater. It would enable owners and operators of these ships to utilize the additional cargo-carrying capacity of their vessels, thereby achieving savings in transportation costs. It would allow modern deep-draft vessels to operate in a more efficient, safe, and economical manner and enable the port to maintain a competitive position in the world coal market. It is estimated that the deepening of the Thimble Shoal and Atlantic Ocean Channels would provide over 6 million cubic yards of suitable quality dredged material for nourishing area beaches under authority of Section 145 of the WRDA 76, as modified by Section 933 of the WRDA 86.

ANALYSES

The most recent detailed analyses of costs, benefits, environmental, and other impacts of the 55-foot-deep outbound channel elements were accomplished in the September 1989 Supplemental Engineering Report. Analyses accomplished subsequent to the 1989 Supplemental Engineering Report have been limited primarily to updating costs in support of periodic budget submittals and keeping the local sponsor advised of the project status. The most recent estimate, based on October 1998 price levels, was accomplished to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 26 million cubic yards of material would be dredged during the initial construction as shown in Table II-3. The costs for this specific concern are based on estimates prepared for the entire 55-foot outbound channel element. It is likely that some of these values would be modified if this concern was accomplished separately from the total 55-foot outbound channel project; however, the estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the water main and tunnel cover items include engineering and design and supervision and administration costs since these are totally non-Federal responsibilities. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-2. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 2

Item	Amount (\$1,000)
Dredge Atlantic Ocean Channel	16,255
Dredge Thimble Shoal Channel	28,121
Dredge Norfolk Harbor Channel	24,814
Dredge Hampton Roads Anchorage F (1)	9,510
Dredge Sewells Point Anchorage	18,141
Remove wrecks	<u>868</u>
Subtotal	97,709
Engineering and design (2%)	1,954
Supervision and administration (4%)	<u>3,908</u>
Total	103,571
Relocate/replace 36-inch water main	5,006
Construct Thimble Shoal tunnel cover	<u>4,184</u>
Total	9,190
Grand total	112,761

(1) Please see anchorage designations for (F), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

Operation and Maintenance Costs

The incremental increase in average annual operation and maintenance costs, based on the maintenance cycles and cubic yardage as shown in Table II-3, is estimated to be \$1.1 million at October 1998 price levels.

Benefits

The benefits attributable to the 55-foot outbound channel are based primarily on transportation savings accruing to the export of coal via deeper channels as described under Plan Accomplishments. This was the premise in the Norfolk Harbor and Channels, Virginia Deepening and Disposal Feasibility Report dated July 1980, and it continues to be the primary force driving the need for deeper outbound channels. The most recent detailed analysis of the benefits--primarily transportation savings, which would accrue to the outbound 55-foot-deep channel element--was accomplished in the 1989 Supplemental Engineering Report. In this analysis, based on October 1989 price levels, the total average annual transportation savings were estimated at \$22.2 million. These savings, however, accrued to both the northside and southside of the port. Although no separation of benefits was accomplished between the northside and southside of the harbor since both sides were considered essential for a viable project, it is estimated that about 60 percent of the savings would accrue to the southside, based on the most recent data available regarding coal exports.

Environmental Impacts

Substantial environmental studies were accomplished during the period from 1982 to 1985 by Federal agencies, state and university research laboratories, and private contractors under provisions of Public Law 99-88. Detailed information regarding the methods, materials, and results of these studies may be found in the complete documents, which are available on microfiche from National Technical Information Services, Washington, D.C. (see Appendix E, Table E-4 for the Internet address). The main emphasis of the effort was to determine and reasonably assess the impacts associated with the deepening of the channels and related placement of the dredged material. Some of the more important studies included effects on benthic resources, commercial benthos, non-commercial benthos, finfish, plankton, phytoplankton, zooplankton, sediment quality, seabed stability, and cultural and archaeological resources. All NEPA and related documentation have been fully satisfied but will need to be updated prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 55-foot outbound element is part of the Norfolk Harbor and Channels project, which is authorized, but not yet constructed. The construction of this element of the project would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA. There are also funding requirements for project implementation from the City of Norfolk, the Chesapeake Bay Tunnel District Commission, and the private pier facility owners and operators.

Operation and Maintenance. Once constructed, maintenance dredging of the additional channel depths in the Federal channels, including the Atlantic Ocean Channel, would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth. Maintenance dredging of access channels and berthing areas would be the responsibility of the owners and operators of adjacent facilities and would require authorization from the Norfolk District Regulatory Branch.

Cost Sharing

The cost-sharing requirements for the 55-foot outbound element are based on the provisions of the WRDAs 86, 88, and 96 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs. The incremental increase in average annual operation and maintenance costs associated

with this project is estimated at \$1.1 million, of which \$550,000 would be a Federal responsibility and \$550,000 a non-Federal responsibility.

Table V-3. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 2

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Atlantic Ocean Channel	16,255	6,502.0	9,753.0
Dredge Thimble Shoal Channel	28,121	11,248.4	16,872.6
Dredge Norfolk Harbor Channel	24,814	9,925.6	14,888.4
Dredge Hampton Roads Anchorage F (1)	9,510	3,804.0	5,706.0
Dredge Sewells Point Anchorage	18,141	7,256.4	10,884.6
Remove wrecks	<u>868</u>	<u>347.2</u>	<u>520.8</u>
Subtotal	97,709	39,083.6	58,625.4
Engineering and design (2%)	1,954	781.6	1,172.4
Supervision and administration (4%)	<u>3,908</u>	<u>1,563.2</u>	<u>2,344.8</u>
Total	103,571	41,428.4	62,142.6
Relocate/replace 36-inch water main	5,006	0.0	5,006.0
Construct Thimble Shoal tunnel cover	<u>4,184</u>	<u>0.0</u>	<u>4,184.0</u>
Total	9,190	0.0	9,190.0
Grand total	112,761	41,428.4	71,332.6

(1) Please see anchorage designations for (F), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

CONCLUSIONS

This specific concern relates only to the southside of the Hampton Roads harbor and does not include all of the elements of the 55-foot outbound channel projects, specifically, the Channel to Newport News. This concern could be more logically addressed with the construction of the entire 55-foot outbound element of the Norfolk Harbor and Channels project. Accordingly, this specific concern will be considered for combination with appropriate prioritized concerns in Section VI to develop a long-range, comprehensive planning strategy for the Port of Hampton Roads.

CONCERN NUMBER 3

NEED TO EXTEND THE LIFE OF THE CRANEY ISLAND DREDGED MATERIAL AREA AND/OR LOCATE ALTERNATIVE PLACEMENT SITES

DESCRIPTION

This concern expresses a need to ensure a practical and feasible long-range solution for the future placement of dredged material from construction and maintenance activities within the Port of Hampton Roads. Periodic dredging requires the placement of material dredged from numerous channels, anchorages, berthing areas, turning basins, and other areas making up the port complex. Continuing vital dredging, maintaining appropriate depths, and preserving the port's economic health are all considerations that account for the identification of this concern by stakeholders and its high priority.

PROPOSED ACTION

The proposed actions necessary to address the above-described concern would include the consideration of the expansion of the Craney Island Dredged Material Area (such as construction of a fourth cell on its east side), placement of dredged material at alternative confined sites, ocean placement of suitable material, beneficial uses of dredged material, and a combination of dredged material management plans. Each of these alternative considerations would have to be evaluated in terms of providing the most economical and environmentally acceptable plan for the long-term placement of

dredged material from navigation projects in the Port of Hampton Roads and adjacent waters.

PLAN ACCOMPLISHMENTS

The Port of Hampton Roads consists of commercial maritime facilities in cities with access to the lower James River, lower Chesapeake Bay and its tributaries, and the Elizabeth River. Waterborne commerce is vital to the adjacent cities, as well as to the Commonwealth of Virginia, to the East Coast, and to the nation. While Hampton Roads is a natural harbor, the depths of many of its channels cannot accommodate deep-draft vessels without periodic dredging. In order to provide for current and future shipping interests, channels must be maintained and even deepened. The provision of long-term placement capability for future dredging operations will ensure that the commercial and military navigation requirements will be satisfied, and the port will continue to thrive and grow.

ANALYSES

A number of studies have been conducted that are related to the long-term dredged material placement needs. These include the 1980 Feasibility Report; 1986 General Design Memorandum; Technical Report EL-81-11, "Development of a Management Place for Craney Island Disposal," published by the Army Corps of Engineers Waterways Experiment Station in December 1981; "Effects of Norfolk Harbor Deepening on Management of Craney Island Disposal Area" dated April 1983; "Site Operations and Monitoring Report 1980 to 1987" dated February 1989 and prepared by the Waterways Experiment Station; Dam Neck Ocean Disposal Site studies that led to final designation from the EPA in March 1988; Norfolk Harbor and Channels, Virginia, Long-Term Disposal (Inner Harbor) dated June 1990; Norfolk Disposal Site studies that led to final designation by the EPA in 1993; Norfolk Harbor and Channels, Virginia, Long-Term Dredged Material Management dated July 1994; and various Section 933 reports referenced in Section III. A reconnaissance study completed in March 1999 determined a Federal interest in proceeding to a feasibility study to evaluate the potential eastward expansion of the Craney Island Dredged Material Area and to

evaluate other potential alternative long-term placement areas. Appropriate analyses regarding construction costs, operation and maintenance costs, benefits, and environmental and other impacts will be included as part of the feasibility report initiated in April 1999 and scheduled for completion in March 2002.

Costs

The evaluation of alternative long-term dredged material placement sites requires the comparison of unit placement costs, i.e. cost per cubic yard. All costs involved in placing the dredged material are included in order to arrive at a valid comparison. The most recent cost analyses were accomplished as part of the Long-Term Dredged Material Management Report dated June 1990. With all of the plans considered, it was clear that the costs of managing dredged material in the port will increase substantially over what they have been in the past. The current toll charges for the Craney Island Dredged Material Area are \$0.86 per cubic yard for direct placement and \$2.30 per cubic yard for deposition into the Craney Island Rehandling Basin. The feasibility study discussed previously will determine the least costly viable plan, which is environmentally and socially acceptable to accommodate long-term dredged material placement in the future.

Benefits

The benefits attributable to the provision of a long-term placement area for dredged material for the port are widespread and substantial and accrue to numerous private and government interests. The assurance of an economical placement area provides for continued maintenance dredging and navigation improvements for the port and helps maintain the port's competitive position in world markets. Provision of a long-term placement area through an eastward expansion, serving as a least-costly alternative, will provide monetary benefits that are specifically quantified for dredged material placement, in addition to the millions of dollars of transportation savings attributable to maintenance dredging of the port channels. The continued maintenance and improvements permit safe and effective commercial and military operations into the foreseeable future.

Environmental Impacts

The environmental impacts associated with all potential long-term dredged material placement areas will require careful evaluation. All requirements of the NEPA, the Clean Water Act, and other applicable statutes will have to be satisfied. The necessary environmental studies will be accomplished as part of the previously discussed feasibility report scheduled for completion in March 2002.

DIVISION OF PLAN RESPONSIBILITY

Federal legislation requires the Commonwealth of Virginia, as the local cost-sharing sponsor, to provide the necessary placement areas for dredged material from Congressionally-authorized channels. Accordingly, the VPA, acting as the statutory agent for the Commonwealth, would be responsible for all construction and operation and maintenance costs associated with a new and/or expanded placement facility to serve the port; however, the WRDA 96 modified the WRDA 86 to include dredged material facilities as part of the general navigation features of a project. In this regard, the dredged material facilities could be cost shared between the Federal Government and the non-Federal sponsor on the same basis as the remainder of project features. This may permit up-front financing of construction costs by the Federal Government with reimbursement over time through the collection of toll charges. The previously discussed feasibility study will carefully evaluate all costs, benefits, and environmental impacts to determine the optimum Federal involvement and cost-sharing requirements in the provision of long-term dredged material placement.

CONCLUSIONS

This concern is extremely important to the maintenance and growth of the port and is directly related to the other identified concerns. A current feasibility study addressing this problem is scheduled for completion in March 2002, and it should provide a satisfactory solution. The concern, however, will be included in Section VI due to the importance and critical relationship to the other prioritized concerns of ensuring a practical and feasible long-range solution for the future placement of dredged material within the port.

CONCERN NUMBER 4

USE OF CRANEY ISLAND DREDGED MATERIAL AREA FOR PORT DEVELOPMENT

DESCRIPTION

This concern expresses a need to make use of part of the Craney Island Dredged Material Area for future port development. The potential expansion of the facility could provide an ideal area for necessary future port development while also addressing Concern Number 3, the provision of a future efficient and cost-effective placement area for dredged material from adjacent waterway.

PROPOSED ACTION

Specific actions have already been put in place to help achieve the resolution of this concern. The Virginia General Assembly has authorized the Craney Island Study Committee, which is comprised of representatives from the VPA, the City of Portsmouth, the Hampton Roads Maritime Administration, the Virginia Pilot Association, and the Army Corps of Engineers, to examine the current use and future expansion of the Craney Island Dredged Material Area and to recommend appropriate future uses of the area. A progress report dated December 1997 was sent to the Senate Finance and House Appropriations Committee of the General Assembly of Virginia. The report concluded that the expansion of the Craney Island Dredged Material Area is critically important to the future of the port in maintaining the capability to dredge at an economical rate and to be able to expand the port in order to meet the expected needs resulting from its projected growth. A second related action resulted from the reconnaissance report, previously discussed under Concern Number 3, which determined that a Federal interest exists in accomplishing a feasibility study to evaluate the future long-term need for dredged material placement areas, including the eastward expansion of the Craney Island Dredged Material Area.

PLAN ACCOMPLISHMENTS

The location of Craney Island Dredged Material Area adjacent to deep-water channels provides outstanding advantages for port use. As previously discussed in Section I, the VPA is moving forward with its 2010 Plan, which will effectively double the container-handling capacity of the Commonwealth-owned general cargo terminals; however, projected growth is expected to quickly use up this increased capacity requiring the provision of a fourth marine terminal. Section I also describes the increase expected in both the amount of containerized shipments and in the size of vessels involved in this trade. The VPA projects the need for a fourth terminal to accommodate the expected rapid increase in container traffic. Also, according to a study conducted by the U.S. Department of Transportation, Office of Intermodalism entitled, "The Impacts of Changes in Ship Design on Transportation Infrastructure and Operations" dated February 1998, mega ships are being constructed that require channel depths up to 50 feet in order to more efficiently transport containers. The use of Craney Island Dredged Material Area for future port development, such as a fourth container terminal, would help provide for continued port growth and would keep the Port of Hampton Roads, as well as the nation, competitive in the world container market.

ANALYSES

The discussion contained under Concern Number 3 is equally applicable to this concern. The VPA's 2010 Plan discussed in Section I provides pertinent analyses regarding future needs for port development. Additional pertinent analyses will be contained in the previously mentioned feasibility study expected to be completed in March 2002.

Costs

No specific costs have been developed for the use of Craney Island Dredged Material Area for future port development.

Benefits

Although no monetary quantification of potential benefits attributable to the use of Craney Island Dredged Material Area for Port Development has been accomplished, it is obvious that such values would be widespread and substantial. Direct benefits would accrue as a result of increased commodity movements and corresponding waterborne transportation savings resulting from the additional terminal facilities adjacent to deep-water channels. Expansion of terminal facilities would also increase employment, payroll, and tax revenues within the region, thus providing additional positive economic impacts.

Environmental Impacts

The environmental impacts associated with the development of port facilities at Craney Island Dredged Material Area would require careful evaluation in a river system already stressed due to existing intensive development by government, commercial, and industrial facilities. The requirements of the NEPA and all other Federal, state, and local environmental laws and regulations would be addressed as part of the feasibility report scheduled for completion in March 2002.

DIVISION OF PLAN RESPONSIBILITY

In accordance with the WRDA 86, as amended, the provision of dredged material placement areas is the responsibility of the non-Federal sponsor; however, the WRDA 96 modified the WRDA 86 to include dredged material facilities as part of the general navigation features of a project. Accordingly, the dredged material facilities could be cost shared between Federal and non-Federal interests on the same basis as the remainder of the project features. It may be possible for the Federal government to finance the costs of constructing an expansion of Craney Island Dredged Material Area with reimbursement over time through the collection of toll charges. Special non-Federal cost sharing may also apply for project purposes other than for the expansion of placement capacity. The previously mentioned feasibility study will examine, in detail, the cost sharing requirements for this specific concern.

CONCLUSIONS

This concern is directly related to and is an integral part of the previously discussed Concern Number 3. The potential expansion of the Craney Island Dredged Material Area and the subsequent construction of a fourth general cargo terminal on Craney Island will be evaluated in the ongoing feasibility study. Both concerns will be included in Section VI.

CONCERN NUMBER 5

NORFOLK HARBOR CHANNEL: NEED TO DEEPEN THE INBOUND LANE FROM 45 FEET TO 50 FEET TO LAMBERTS POINT

DESCRIPTION

This concern expresses a need to deepen the elements of the inbound lane of the Norfolk Harbor Channel from their currently maintained depth of 45 feet to a depth of 50 feet to Lamberts Point. The 45-foot inbound element is a separable element of the Norfolk Harbor and Channels project authorized by the WRDA 86. The concern, identified by stakeholders and prioritized by Circle "A" members, is related to improvements to inbound navigation on the southside of the Hampton Roads harbor.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the inbound channel element of the Norfolk Harbor Channel to 50 feet. As discussed in Section II, it would also require the dredging of the Thimble Shoal Channel and appropriate access channels and berthing areas. This construction would provide a full-width 50-foot channel for the port. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 50-foot main channel depth.

Dredged material from the Corps of Engineers project would be placed in the Dam Neck Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process.

Suitable material from the Thimble Shoal Channel would be considered for nourishing area beaches. During the PED phase, consideration would be given to placing dredged material in the Craney Island Dredged Material Area, which could result in a significant reduction in project cost.

PLAN ACCOMPLISHMENTS

Provision of the 50-foot-deep inbound channel elements would permit the port to safely and efficiently accommodate larger container ships that are transporting increasing amounts of containerized cargo. The Plan would also provide a one-level channel at 50 feet deep over authorized/recommended widths.

ANALYSES

Analyses accomplished on this specific concern have been in connection with the entire Norfolk Harbor and Channels project. There have been no separate economic evaluations made of the 50-foot inbound channel elements. The most recent detail cost data for this element are contained in the 1986 General Design Memorandum. Since completion of this document, cost estimates based on price level increase only have been developed to support budget requests and to keep the local sponsor informed. The most recent estimate, based on October 1998 price levels, was accomplished to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 3,841,000 cubic yards of material would be dredged during the initial construction as shown in Table II-3. These cost estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are the responsibility of each respective user, are not included in these estimates. In addition, the estimates do not

include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-4. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 5

<u>Item</u>	<u>Amount (\$1,000)</u>
Dredge Thimble Shoal Channel	12,150
Dredge Norfolk Harbor Channel	<u>7,601</u>
Subtotal	19,751
Engineering and design (2%)	395
Supervision and administration (4%)	<u>790</u>
Total	20,936

Operation and Maintenance Costs

Based on experience with the maintenance of the 50-foot outbound element, it is anticipated that there will be no significant increase in the average annual quantity of maintenance material and, consequently, no incremental average annual maintenance costs associated with this concern.

Benefits

No quantification of monetary benefits has been accomplished for the 50-foot-deep inbound lane of the Norfolk Harbor Channel; however, it is expected that substantial beneficial impacts would accrue to the owners and operators of large container ships that call at the existing terminals in Norfolk and Portsmouth. Potential benefits would grow as the amount of general cargo increases within the port and container ships calling at the port become increasingly larger. Container shipments have grown significantly in recent years, and industry experts project even more substantial increases in the future. VPA studies, previously discussed in Section I, indicate a potential by the year 2010 for a 250 percent increase in containerized cargo and a 200 percent increase in break bulk cargo over 1994 levels. Industry estimates project that by the year 2010, almost 40 percent of containerized cargo will move in vessels with a capacity of 4,000 TEU's or greater. Container ships have already called at the port with the capacity of 6,000 TEU's and loaded drafts of 47.5 feet. In addition to container ships, the 50-foot-deep inbound channel would benefit all vessel traffic on the southside of the Hampton Roads harbor by replacing the existing two-level channel with a one-level channel at the 50-foot depth over existing authorized/recommended widths.

Environmental Impacts

Substantial environmental studies were accomplished during the period from 1982 to 1985 by Federal agencies, state and university research laboratories, and private contractors under provisions of PL 99-88, as described previously for the 55-foot-deep outbound lane of the Norfolk Harbor and Channels project (Concern Number 2). All NEPA and related documentation have been fully satisfied but will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 50-foot inbound element is part of the Norfolk Harbor and Channels project, which is authorized but not yet constructed. The construction of this element of the project would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA. There are also funding requirements for project implementation from the private pier facility owners and operators.

Operation and Maintenance. Once constructed, maintenance dredging of the additional channel depths in the Federal channels would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth. Maintenance dredging of access channels and berthing areas would be the responsibility of the owners and operators of adjacent facilities and would require authorization from the Norfolk District Regulatory Branch.

Cost Sharing

Since no significant increase is expected in the average annual quantity of maintenance material and, consequently, no incremental average annual maintenance cost, no additional cost sharing is anticipated.

Table V-5. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 5

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Thimble Shoal Channel	12,150	4,860.0	7,290.0
Dredge Norfolk Harbor Channel	<u>7,601</u>	<u>3,040.4</u>	<u>4,560.6</u>
Subtotal	19,751	7,900.4	11,850.6
Engineering and design (2%)	395	158.0	237.0
Supervision and administration (4%)	<u>790</u>	<u>316.0</u>	<u>474.0</u>
Total	20,936	8,374.4	12,561.6

CONCLUSIONS

This specific concern only relates to the southside of the Hampton Roads harbor. It would complete the 50-foot channel system in the port and appears to have sufficient merit to be investigated in further detail. This concern will be considered for combination with appropriate prioritized concerns in Section VI.

CONCERN NUMBER 6

ELIZABETH RIVER CHANNEL: NEED TO DEEPEN FROM 40 FEET TO THE AUTHORIZED DEPTH OF 45 FEET FROM LAMBERTS POINT TO THE JUNCTION OF THE EASTERN AND SOUTHERN BRANCH CHANNELS

DESCRIPTION

This concern expresses a need to deepen the Elizabeth River Channel from its currently maintained depth of 40 feet to the authorized depth of 45 feet from Lamberts Point to the junction of the Eastern Branch and Southern Branch Channels. The concern,

identified by stakeholders and prioritized by Circle "A" members, is a separable element of what is generally referred to as the Elizabeth River and Southern Branch Channels.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the Port Norfolk and Town Point Reaches of the Elizabeth River Channel to 45 feet, as discussed in Section II. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 45-foot main channel depth. Dredged material from the Corps of Engineers project would be placed in the Craney Island Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process.

PLAN ACCOMPLISHMENTS

Provision of the 45-foot-deep channel would benefit the terminals and ship repair yards located along these reaches of the Elizabeth River Channel, such as the Portsmouth Marine Terminal and the general cargo facilities of Sea Land Service, Inc., located in the City of Portsmouth on the north side of Pinners Point.

ANALYSES

Analyses accomplished on this specific concern have been in connection with the entire Elizabeth River Channel and Southern Branch Channel 45-foot element. There have been no separate economic evaluations made of this separable element. Since completion of the 1980 Feasibility Report, cost estimates based on price level increases only have been developed to support budget requests and to keep the local sponsor informed. The most recent estimate, based on October 1998 price levels, was prepared to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 2,430,000 cubic yards of material would be dredged during the initial construction. These cost estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-6. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 6

<u>Item</u>	<u>Amount (\$1,000)</u>
Dredge Elizabeth River Channel (Port Norfolk and Town Point Reaches)	9,842
Craney Island tolls	<u>2,790</u>
Subtotal	12,632
Engineering and design (2%)	253
Supervision and administration (4%)	<u>505</u>
Total	13,390

Operation and Maintenance Costs

It is estimated that there would be an average annual increase of 21,000 cubic yards in dredged material removed to support the maintenance of a 45-foot-deep channel over that currently dredged for the existing 40-foot-deep channel in the Port Norfolk and Town Point Reaches of the Elizabeth River Channel. The incremental increase in average annual operation and maintenance costs, based on this additional quantity of dredged material, is estimated to be \$100,000 at October 1998 price levels.

Benefits

No quantification of monetary benefits has been accomplished for this specific element. Benefit estimates were prepared for the entire Elizabeth River Channel and Southern Branch Channel 45-foot element in the 1980 Feasibility Report and updated periodically thereafter; however, the price level indexes used to make the updates may not reflect actual conditions that have occurred in the shipping industry. The latest benefit update was to October 1986 price levels and indicated average annual benefits of over \$15 million for the entire 45-foot project. The estimate did not reflect changes in the quantity and type of commodities being currently transported on the channel and no benefits were estimated to accrue to the reach of the Elizabeth River Channel described in this concern.

Environmental Impacts

During the 1980 Feasibility Report study, a Final EIS was prepared. A Final Supplement 1 to this statement was prepared in 1985 to address additional work and changes to the project up to that time. Extensive environmental investigations have already been performed during PED. Physical and numerical model studies of the entire Norfolk Harbor and Channels project were conducted to predict possible effects on tides, currents, salinity, and sedimentation. Extensive sediment quality testing was also performed on the entire harbor system and supplemental sediment studies were conducted for the Norfolk Harbor and Southern Branch Channels in August 1995 and August and September 1996 (see Appendix E, Tables E-1 and E-2 for references to reports on these studies). However, it is expected that additional work will be required to

support the preparation of necessary NEPA documentation prior to construction of this element.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 45-foot element is part of the Norfolk Harbor and Channels project, which is authorized, but not yet constructed. The construction of this element of the project would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 35 percent of the general navigation features (10 percent of which can be paid over 30 years), including Craney Island toll charges but excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA. There are also funding requirements for project implementation from the private pier facility owners and operators.

Operation and Maintenance. Once constructed, maintenance dredging of the additional channel depths in the Federal channels would be accomplished by the Corps of Engineers. The Federal Government would be responsible for 100 percent of the operation and maintenance cost of the 45-foot-deep channel. Maintenance dredging of access channels and berthing areas would be the responsibility of the owners and operators of adjacent facilities and would require authorization from the Norfolk District Regulatory Branch.

Cost Sharing

The cost-sharing requirements for the 45-foot element are based on the provisions of the WRDA's 86 and 88 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs.

Table V-7. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 6

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Elizabeth River Channel (Port Norfolk and Town Point Reaches)	9,842	6,397.3	3,444.7
Craney Island tolls	<u>2,790</u>	<u>1,813.5</u>	<u>976.5</u>
Subtotal	12,632	8,210.8	4,421.2
Engineering and design (2%)	253	164.5	88.5
Supervision and administration (4%)	<u>505</u>	<u>328.2</u>	<u>176.8</u>
Total	13,390	8,703.5	4,686.5

CONCLUSIONS

This specific concern is a separate element of the Elizabeth River Channel and Southern Branch Channel 45-foot improvements, which provides for deepening the existing 40-foot channel to the authorized depth of 45 feet from Lamberts Point to the Norfolk Southern Railroad bridge on the Southern Branch of the Elizabeth River. This concern could be more logically addressed with the construction of the entire 45-foot reach. Accordingly, this specific concern will be considered for combination with appropriate prioritized concerns in Section VI to develop a long-range, comprehensive planning strategy for the port.

CONCERN NUMBER 7 (TIE)

NORFOLK HARBOR CHANNEL: NEED TO DEEPEN THE INBOUND LANE FROM 45 FEET TO THE AUTHORIZED DEPTH OF 55 FEET TO LAMBERTS POINT

DESCRIPTION

This concern expresses a need to deepen the elements of the inbound lane of the Norfolk Harbor Channel from their currently maintained depth of 45 feet to the authorized depth of 55 feet to Lamberts Point. The 55-foot inbound channel is a separable element of the Norfolk Harbor and Channels project authorized by the WRDA 86. The concern identified by stakeholders and prioritized by Circle "A" members is related to improvements to inbound navigation on the southside of the Hampton Roads harbor, and it is an extension of Concern Number 5.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the inbound channel element of the Norfolk Harbor Channel to 55 feet. As discussed in Concern Number 2, it would also require the dredging of the approach channels (the Atlantic Ocean Channel and the Thimble Shoal Channel), anchorages (Anchorage F and Sewells Point), and appropriate access channels and berthing areas. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 55-foot main channel depth. In addition, some wrecks would have to be cleared, a water main would have to be relocated or replaced, a tunnel cover would have to be constructed to protect the Chesapeake Bay Bridge-Tunnel, which runs under the Thimble Shoal Channel, and aids to navigation would have to be moved and/or installed.

Dredged material from the Corps of Engineers project would be placed in the Dam Neck Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process. Suitable material from the Thimble Shoal and Atlantic Ocean Channels would be

considered for nourishing area beaches. During the PED phase, consideration would be given to placing dredged material in the Craney Island Dredged Material Area, which could result in a significant reduction in project cost.

PLAN ACCOMPLISHMENTS

Plan accomplishments would be the same as those described previously for Concern Number 5, except the additional depth would obviously accommodate larger container ships. It would also enable owners and operators of other ships to utilize the additional cargo-carrying capacity of their vessels, thereby, achieving savings in transportation costs. It would allow modern deep-draft vessels to operate in a more efficient, safe, and economical manner and enable the port to maintain a competitive position in the world containerized-cargo market. It is estimated that the deepening of the Thimble Shoal and Atlantic Ocean Channels would provide over 6 million cubic yards of suitable quality dredged material for nourishing area beaches under the authority of Section 145 of the WRDA 76, as modified by Section 933 of the WRDA 86.

ANALYSES

As in the case of Concern Number 5, there have been no separate economic evaluations made of the 55-foot inbound channel element. Discussions contained relative to Concern Number 5 are equally appropriate for this concern. The most recent estimate, based on October 1998 price levels, was prepared to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 24,601,000 cubic yards of material would be dredged during the initial construction as shown in Table II-3. It is not very likely that this concern would be implemented prior to the implementation of Concern Number 2. Detailed cost estimates have been made, based on this premise and are included in Section VI. Accordingly, it is not considered warranted to expend time and resources to prepare a separate detailed cost estimate for

this concern, assuming Concern Number 2 is not in place. However, using readily available information, it is possible to develop a reasonable, preliminary estimate for the cost of constructing Concern Number 7 as a "stand alone" increment, which is presented for informational purposes and to provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the water main and tunnel cover items also include engineering and design and supervision and administration costs since these are totally a non-Federal responsibility. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-8. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 7 (TIE)

Item	Amount (\$1,000)
Dredge Atlantic Ocean Channel	16,276
Dredge Thimble Shoal Channel	26,068
Dredge Norfolk Harbor Channel	32,200
Dredge Hampton Roads Anchorage F (1)	9,510
Dredge Sewells Point Anchorage	18,141
Remove wrecks	<u>868</u>
Subtotal	103,063
Engineering and design (2%)	2,061
Supervision and administration (4%)	<u>4,123</u>
Total	109,247
Relocate/replace 36-inch water main	5,006
Construct Thimble Shoal tunnel cover	<u>4,184</u>
Total	9,190
Grand total	118,437

(1) Please see anchorage designations for (F), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

Operation and Maintenance Costs

The incremental increase in average annual operation and maintenance costs is estimated to be \$820,000 at October 1998 price levels.

Benefits

Discussion of benefits for this concern is identical to that presented for Concern Number 5. As previously stated, container ships with a potential loaded draft of 47.5 feet have already called at the port, and even larger ships are expected. Industry experts expect an increasing amount of containerized cargo to move in these mega ships in the future. A 55-foot-deep inbound channel would permit appropriate under-keel clearance for these larger ships and would provide for efficient and safe navigation.

Environmental Impacts

Substantial environmental studies were accomplished during the period from 1982 to 1985 by Federal agencies, state and university research laboratories, and private contractors under provisions of PL 99-88, as described previously for the 55-foot-deep outbound lane of the Norfolk Harbor and Channels project (Concern Number 2). All NEPA and related documentation have been fully satisfied but will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II and Concern Number 5, the 55-foot inbound element is part of the Norfolk Harbor and Channels project that is authorized, but not yet constructed. The construction of this element of the project would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA. There are also funding requirements for project implementation from the City of Norfolk, the

Chesapeake Bay Tunnel District Commission, and the private pier facility owners and operators.

Operation and Maintenance. Once constructed, maintenance dredging of the additional channel depths in the Federal channels, including the Atlantic Ocean Channel, would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth. Maintenance dredging of access channels and berthing areas would be the responsibility of the owners and operators of adjacent facilities and would require authorization from the Norfolk District Regulatory Branch.

Cost Sharing

The cost-sharing requirements for the 55-foot inbound element are based on the provisions of the WRDA's 86, 88, and 96 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs. The incremental increase in average annual operation and maintenance costs associated with this element is estimated at \$820,000, of which \$410,000 would be a Federal responsibility and \$410,000 a non-Federal responsibility.

Table V-9. INITIAL CONSTRUCTION COST SHARING FOR CONCERN NUMBER
7 (TIE)

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Atlantic Ocean Channel	16,276	6,510.4	9,765.6
Dredge Thimble Shoal Channel	26,068	10,427.2	15,640.8
Dredge Norfolk Harbor Channel	32,200	12,880.0	19,320.0
Dredge Hampton Roads Anchorage F (1)	9,510	3,804.0	5,706.0
Dredge Sewells Point Anchorage	18,141	7,256.4	10,884.6
Remove wrecks	<u>868</u>	<u>347.2</u>	<u>520.8</u>
Subtotal	103,063	41,225.2	61,837.8
Engineering and design (2%)	2,061	824.4	1,236.6
Supervision and administration (4%)	<u>4,123</u>	<u>1,649.2</u>	<u>2,473.8</u>
Total	109,247	43,698.8	65,548.2
Relocate/replace 36-inch water main	5,006	0.0	5,006.0
Construct Thimble Shoal tunnel cover	<u>4,184</u>	<u>0.0</u>	<u>4,184.0</u>
Total	9,190	0.0	9,190.0
Grand total	118,437	43,698.8	74,738.2

(1) Please see anchorage designations for (F), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

CONCLUSIONS

This specific concern only relates to the southside of the Hampton Roads harbor. It appears to have merit and should be investigated in further detail. This concern will be considered for combination with appropriate prioritized concerns in Section VI.

CONCERN NUMBER 7 (TIE)

FUNDING

DESCRIPTION

Funding is a universal concern involved in all port operations and development, since there is rarely sufficient money to accomplish all that is desired. The expressed need is to establish appropriate priorities so that available funds are used most efficiently and effectively.

PROPOSED ACTION

The objective is to help decision makers to arrive at more informed judgments regarding the port's future navigation problems, needs, concerns, and opportunities. Better and more comprehensive information will assist in reducing funding constraints, which limit the extent to which prioritized concerns may be successfully addressed. As discussed in Section I, a primary purpose of this Plan is to establish priorities based on the input of stakeholders, which will be beneficial in preparing and justifying budget requests. Other planning actions discussed in Section I, such as the VPA's 2010 Plan, will also facilitate future funding decisions.

PLAN ACCOMPLISHMENTS

The availability of more comprehensive information regarding the navigation concerns identified by port users and prioritized by Circle "A" stakeholders will permit decision makers to better determine the best use of the funds that are available. Since there will never be enough money to do everything that stakeholders desire, the Plan will help Federal, state, local, and private investors to arrive at informed decisions based on a prioritized list established by port users and interests.

CONCLUSIONS

A key objective of the Navigation Management Plan is the identification and prioritization of the navigation problems, needs, concerns, and opportunities associated with the operation, maintenance, and development of the port. Obviously, appropriate funding from Federal, state, local, and private interests is essential to the development of a long-range, comprehensive planning strategy for the port. Since adequate funding is a necessity for the implementation of actions required to address all of the identified concerns, it will be discussed further in Section VI, particularly as it relates to cost sharing.

CONCERN NUMBER 9

CHANNEL TO NEWPORT NEWS: NEED TO DEEPEN THE OUTBOUND LANE FROM 50 FEET TO THE AUTHORIZED DEPTH OF 55 FEET

DESCRIPTION

This concern expresses a need to deepen the elements of the outbound lane of the Channel to Newport News from their currently maintained depth of 50 feet to the authorized depth of 55 feet. The 55-foot outbound channel is a separable element of the Norfolk Harbor and Channels project authorized by the WRDA 86. This concern, identified by stakeholders and prioritized by Circle "A" members, is related to improvements to outbound navigation on the northside of the Hampton Roads harbor.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the Channel to Newport News to 55 feet. It would be deepened, however, over its fully authorized width of 800 feet, as was done when it was deepened from 45 feet to 50 feet; therefore, there would be no need for the inbound lane. As discussed in Section II, it would also require the dredging of the outbound lanes of the approach channels (the Atlantic Ocean Channel, the Thimble Shoal Channel, and the Entrance Reach of the Norfolk Harbor Channel), anchorages (Anchorage F and Sewells Point), and appropriate access channels and berthing areas. The access channels and

berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 55-foot main channel depth. In addition, some wrecks would have to be cleared, a tunnel cover would have to be constructed to protect the Chesapeake Bay Bridge-Tunnel, which runs under the Thimble Shoal Channel, and aids to navigation would have to be moved and/or installed.

Dredged material from the Corps of Engineers project would be placed in the Dam Neck Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process. Suitable material from the Thimble Shoal and Atlantic Ocean Channels would be considered for nourishing area beaches. During the PED phase, consideration would be given to placing dredged material in the Craney Island Dredged Material Area, which could result in a significant reduction in project cost.

PLAN ACCOMPLISHMENTS

Provision of the 55-foot-deep Channel to Newport News and its outbound elements would primarily serve the large bulk coal carriers departing the northside of the port with loaded drafts of 50 feet and greater. It would enable owners and operators of these ships to utilize the additional cargo-carrying capacity of their vessels, thereby, achieving savings in transportation costs. It would allow modern deep-draft vessels to operate in a more efficient, safe, and economical manner and enable the port to maintain a competitive position in the world coal market. It is also estimated that the deepening of the Thimble Shoal and Atlantic Ocean Channels would provide over 6 million cubic yards of suitable quality dredged material for nourishing area beaches under authority of Section 145 of the WRDA 76, as modified by Section 933 of the WRDA 86.

ANALYSES

The most recent detailed analyses of costs, benefits, environmental, and other impacts of the 55-foot-deep Channel to Newport News and its outbound elements were accomplished in the 1989 Supplemental Engineering Report, as discussed in Concern Number 2. Analyses accomplished subsequent to this report have been limited primarily

to updating costs in support of periodic budget submittals and keeping the local sponsor advised of project status. The most recent estimate, based on October 1998 price levels, was accomplished to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 26.2 million cubic yards of material would be dredged during the initial construction as shown in Table II-3. The costs for this specific concern are based on estimates prepared for the entire 55-foot outbound channel element. It is likely that some of these values would be modified if this concern was accomplished separately from the total 55-foot outbound channel project; however, the estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the tunnel cover item also includes engineering and design and supervision and administration costs since these are totally a non-Federal responsibility. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-10. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 9

Item	Amount (\$1,000)
Dredge Atlantic Ocean Channel	16,255
Dredge Thimble Shoal Channel	28,121
Dredge Channel to Newport News	26,144
Dredge Hampton Roads Anchorage F (1)	9,510
Dredge Sewells Point Anchorage	18,141
Remove wrecks	<u>868</u>
Subtotal	99,039
Engineering and design (2%)	1,981
Supervision and administration (4%)	<u>3,962</u>
Total	104,982
Construct Thimble Shoal tunnel cover	<u>4,184</u>
Grand total	109,166

(1) Please see anchorage designations for (F), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

Operation and Maintenance Costs

The incremental increase in average annual operation and maintenance costs, based on the maintenance cycles and cubic yardage as shown in Table II-3, is estimated to be \$700,000 at October 1998 price levels.

Benefits

The benefits attributable to the 55-foot outbound channel are based primarily on transportation savings accruing to the export of coal via deeper channels as described under Plan Accomplishments and in Concern Number 2. As indicated in Concern Number 2, a total savings of \$22.2 million would accrue to the total 55-foot-deep outbound channel, both the northside and southside of the harbor. Although no separation of benefits was accomplished between the northside and southside of the harbor, it is estimated that about 40 percent of the savings would accrue to the northside, based on the most recent data available regarding coal exports.

Environmental Impacts

Substantial environmental studies were accomplished during the period from 1982 to 1985 by Federal agencies, state and university research laboratories, and private contractors under provisions of Public Law 99-88, as described previously for the 55-foot-deep outbound lane for the Norfolk Harbor and Channels project. While all NEPA and related documentation have been fully satisfied, they will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 55-foot outbound element is part of the Norfolk Harbor and Channels project that is authorized, but not yet constructed. The construction of this element of the project would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA. There are also funding requirements

for project implementation from the Chesapeake Bay Tunnel District Commission and the private pier facility owners and operators.

Operation and Maintenance. Once constructed, maintenance dredging of the additional channel depths in the Federal channels, including the Atlantic Ocean Channel, would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth. Maintenance dredging of access channels and berthing areas would be the responsibility of the owners and operators of adjacent facilities and would require authorization from the Norfolk District Regulatory Branch.

Cost Sharing

The cost-sharing requirements for the 55-foot outbound element are based on the provisions of the WRDA's 86, 88, and 96 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs. The incremental increase in average annual operation and maintenance costs associated with the project is estimated at \$700,000, of which \$350,000 would be a Federal responsibility and \$350,000 a non-Federal responsibility.

Table V-11. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 9

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Atlantic Ocean Channel	16,255	6,502.0	9,753.0
Dredge Thimble Shoal Channel	28,121	11,248.4	16,872.6
Dredge Channel to Newport News	26,144	10,457.6	15,686.4
Dredge Hampton Roads Anchorage F (1)	9,510	3,804.0	5,706.0
Dredge Sewells Point Anchorage	18,141	7,256.4	10,884.6
Remove wrecks	<u>868</u>	<u>347.2</u>	<u>520.8</u>
Subtotal	99,039	39,615.6	59,423.4
Engineering and design (2%)	1,981	792.4	1,188.6
Supervision and administration (4%)	<u>3,962</u>	<u>1,584.8</u>	<u>2,377.2</u>
Total	104,982	41,992.8	62,989.2
Construct Thimble Shoal tunnel cover	<u>4,184</u>	<u>0.0</u>	<u>4,184.0</u>
Grand total	109,166	41,992.8	67,173.2

(1) Please see anchorage designations for (F), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

CONCLUSIONS

This concern relates only to the northside of the Hampton Roads harbor and does not include all of the elements of the 55-foot outbound channel project; specifically, most of the Norfolk Harbor Channel. It could be more logically addressed with the

construction of the entire 55-foot outbound element of the Norfolk Harbor and Channels project. Accordingly, this specific concern will be considered for combination with appropriate prioritized concerns in Section VI to develop a long-range, comprehensive planning strategy for the Port of Hampton Roads.

CONCERN NUMBER 10 (TIE)

SOUTHERN BRANCH CHANNEL: NEED TO DEEPEN FROM 40 FEET TO THE AUTHORIZED DEPTH OF 45 FEET TO THE NORFOLK SOUTHERN RAILROAD BRIDGE

DESCRIPTION

This concern expresses a need to deepen a portion of the Southern Branch Channel from its currently maintained depth of 40 feet to the authorized depth of 45 feet from the junction with the main channel of the Elizabeth River upstream to the Norfolk Southern Railroad bridge. The concern, identified by stakeholders and prioritized by Circle "A" members, is a separable element of what is generally referred to as the Elizabeth River and Southern Branch Channels.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the Lower and Middle Reaches of the Southern Branch Channel to 45 feet, as discussed in Section II. It would also include deepening the approach and turning basin from 40 feet to 45 feet opposite the Norfolk Naval Shipyard between Miles 13 and 14. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 45-foot main channel depth. Dredged material from the Corps of Engineers project would be placed in the Craney Island Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process. In addition, some cables would have to be removed.

PLAN ACCOMPLISHMENTS

Provision of the 45-foot-deep channel would benefit the various industries, ship repair yards, and storage facilities located along these reaches of the Southern Branch Channel, such as the Navy operations at the Norfolk Naval Shipyard. It would permit safe and efficient navigation for large commercial and Navy ships calling at terminals in this area of the river.

ANALYSES

As in the case of Concern Number 6, there have been no separate economic evaluations made of this portion of the Elizabeth River Channel and Southern Branch Channel 45-foot element. Discussions relative to Concern Number 6 are equally appropriate for this concern. The most recent estimate, based on October 1998 price levels, was prepared to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 4,770,000 cubic yards of material would be dredged during the initial construction. These cost estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the cable item also includes engineering and design and supervision and administration costs since these are totally a non-Federal responsibility. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next

major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-12. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 10 (TIE)

Item	Amount (\$1,000)
Dredge Southern Branch Channel (Lower and Middle Reaches)	7,209
Craney Island tolls	<u>2,050</u>
Subtotal	9,259
Engineering and design (2%)	185
Supervision and administration (4%)	<u>370</u>
Total	9,814
Remove cables	<u>305</u>
Grand total	10,119

Operation and Maintenance Costs

It is estimated that there would be an average annual increase of 12,000 cubic yards in dredged material removed to support the maintenance of a 45-foot-deep channel over that currently dredged for the existing 40-foot-deep channel in the Middle and Lower Reaches of the Southern Branch Channel. The incremental increase in average annual operation and maintenance costs, based on this additional quantity of dredged material, is estimated to be \$50,000 at October 1998 price levels.

Benefits

Discussion of monetary benefits included for Concern Number 6 is also appropriate for this concern. As previously stated, the latest benefit quantification was based on October 1986 price levels and indicated average annual benefits of over \$15 million for the entire Elizabeth River Channel and Southern Branch Channel 45-foot element.

Environmental Impacts

The discussion of environmental impacts relative to Concern Number 6 are equally applicable to this concern. Although all NEPA and related requirements have been fully satisfied, they will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II and Concern Number 6, the 45-foot element is part of the Norfolk Harbor and Channels project. Discussions included for Concern Number 6 are also applicable to this concern. There are also funding requirements for project implementation from the owner of the cables to be removed and private pier facility owners and operators.

Operation and Maintenance. Discussions included for Concern Number 6 are also applicable to Concern Number 10 (tie).

Cost Sharing

Discussions included for Concern Number 6 are also applicable to this concern. The following table shows the apportionment of Federal and non-Federal construction costs.

Table V-13. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 10 (TIE)

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Southern Branch Channel (Lower and Middle Reaches)	7,209	4,685.9	2,523.1
Craney Island tolls	<u>2,050</u>	<u>1,332.5</u>	<u>717.5</u>
Subtotal	9,259	6,018.4	3,240.6
Engineering and design (2%)	185	120.2	64.8
Supervision and administration (4%)	<u>370</u>	<u>240.5</u>	<u>129.5</u>
Total	9,814	6,379.1	3,434.9
Remove cables	<u>305</u>	<u>0.0</u>	<u>305.0</u>
Grand total	10,119	6,379.1	3,739.9

CONCLUSIONS

This specific concern is a separate portion of the Elizabeth River Channel and Southern Branch Channel 45-foot improvements, which provide for deepening the existing 40-foot channel to the authorized depth of 45 feet from Lamberts Point to the Norfolk Southern Railroad bridge on the Southern Branch of the Elizabeth River. This concern could not be addressed without first addressing Concern Number 6.

Accordingly, this specific concern will be considered for combination with appropriate prioritized concerns in Section VI to develop a long-range, comprehensive planning strategy for the port.

CONCERN NUMBER 10 (TIE)

NEED TO DEEPEN THE ENTIRE EASTERNMOST ANCHORAGE AREA OPPOSITE SEWELLS POINT (K-1) AND A SMALL SECTION OF CHANNEL TO 50 FEET TO PROVIDE EASIER TRANSIT BETWEEN THE NORFOLK HARBOR CHANNEL AND THE CHANNEL TO NEWPORT NEWS; IN ADDITION, THE K-1 ANCHORAGE WOULD NEED TO BE RELOCATED

DESCRIPTION

This concern expresses a need to deepen the K-1 Anchorage to 50 feet, including a small section of the Norfolk Harbor Channel adjacent to the anchorage area. Also included is a small area, adjacent to the K-1 Anchorage, known as the Naval Maneuvering Area.

PROPOSED ACTION

Aside from deepening the areas described from 45 feet to 50 feet, the existing K-1 Anchorage would have to be relocated to an alternate site. This relocation would necessitate the deauthorization of the existing anchorage site and the consideration of a newly authorized anchorage area to be evaluated in a comprehensive anchorage analysis for the entire port. This analysis could be conducted as part of the PED phase of a major channel deepening or as a separate investigation. Dredged material would be placed in the Dam Neck Dredged Material Area.

PLAN ACCOMPLISHMENTS

Deepening these areas from 45 feet to 50 feet would provide a safer and more efficient turn to facilitate the maneuvering of large vessels from one channel to the other. It would be most beneficial for larger bulk coal carriers taking on partial loads at terminals on both the northside and southside of the port.

ANALYSES

There have been no economic evaluations made for this specific concern, although initial costs have been estimated to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 4.5 cubic yards of material would be dredged during the initial construction. Unlike the deepening elements discussed earlier, no studies or preliminary design have been conducted on this improvement, previous to its being included as part of the Navigation Management Plan; therefore, for the purposes of this analysis only, the cost estimate for the relocation of the K-1 Anchorage is based on the deepening of the K-2 Anchorage area by 5 feet from 40 feet to 45 feet, thus retaining the 45-foot-deep anchorage with a 1,200-foot swinging radius. The estimates presented in the following table are for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. The costs for aids to navigation (the responsibility of the Coast Guard) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-14. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 10 (TIE)

Item	Amount (\$1,000)
Dredge K-1 Anchorage (1)	15,876
Dredge K-2 Anchorage (1)	9,639
Engineering and design (2%)	510
Supervision and administration (4%)	<u>1,021</u>
Total	27,046

(1) Please see anchorage designations for (K-1), (K-2), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

Operation and Maintenance Costs

It is estimated that there would be an average annual increase of 50,000 cubic yards in dredged material removed to support the maintenance in this area over the existing depths. The incremental increase in average annual operation and maintenance costs, based on this additional quantity of dredged material, is estimated to be \$200,000 at October 1998 price levels.

Benefits

Although no monetary values have been quantified for addressing this concern, it would provide substantial beneficial impacts resulting from the provision of an adequate area to permit large vessels to make the turn from one channel to the other with reduced tug assistance. It would enhance navigation in the port by providing additional safety, effectiveness, and efficiency in operations.

Environmental Impacts

All NEPA and related requirements will be fully satisfied prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. The deepening of the K-1 Anchorage, a small part of the Norfolk Harbor Channel, and the Naval Maneuvering Area to 50 feet and the relocation of the existing anchorage area would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate authorization and funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation, for the dredging in excess of 45 feet. For the area where the dredging is 45 feet or less, the VPA would be responsible for 35 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA.

Operation and Maintenance. Once constructed, maintenance dredging of the additional depths would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth; however, the Federal Government would be responsible for 100 percent of the operation and maintenance cost of the 45-foot deep K-2 Anchorage.

Cost Sharing

The cost-sharing requirements for this work are based on the provisions of the WRDA's 86, 88, and 96 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs. The incremental increase in average annual operation and maintenance costs associated with this project is estimated at \$200,000, of which \$150,000 would be a Federal responsibility and \$50,000 a non-Federal responsibility.

Table V-15. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 10 (TIE)

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge K-1 Anchorage (1)	15,876	6,350.4	9,525.6
Dredge K-2 Anchorage (1)	9,639	6,265.3	3,373.7
Engineering and design (2%)	510	252.3	257.7
Supervision and administration (4%)	<u>1,021</u>	<u>504.6</u>	<u>516.4</u>
Total	27,046	13,372.6	13,673.4

(1) Please see anchorage designations for (K-1), (K-2), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

CONCLUSIONS

The implementation of this concern would require the deauthorization of the existing Federally authorized K-1 Anchorage area and the consideration of an alternative replacement location. The concern, however, has substantial merit and will be considered in Section VI.

CONCERN NUMBER 12

**SOUTHERN BRANCH CHANNEL: NEED TO DEEPEN FROM 35 FEET TO
THE AUTHORIZED DEPTH OF 40 FEET TO GILMERTON BRIDGE**

DESCRIPTION

This concern expresses a need to deepen a portion of the Southern Branch Channel from its currently maintained depth of 35 feet to the authorized depth of 40 feet from the Norfolk Southern Railroad bridge to the Gilmerton Bridge (U.S. Routes 460 and 13 highway bridge). The concern, identified by stakeholders and prioritized by Circle

"A" members, is a separable element of what is generally referred to as the Elizabeth River Channel and Southern Branch Channels.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the Upper Reach of the Southern Branch Channel to 40 feet, as discussed in Section II. It would also include the construction of a 800 feet turning basin to a depth of 40 feet at the channel's terminus. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 40-foot main channel depth. Dredged material from the Corps of Engineers project would be placed in the Craney Island Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process. In addition, a water main would have to be relocated or replaced.

PLAN ACCOMPLISHMENTS

Provision of the 40-foot-deep channel would benefit deep-draft vessels in the coastwise and foreign trade that transport petroleum, grain, general cargo, and miscellaneous dry and liquid bulk commodities to and from terminals on the Southern Branch. It would also provide an opportunity for further industrial development along this reach of the river.

ANALYSES

The most recent detailed analyses of costs, benefits, and environmental and other impacts of this concern were made in the 1980 Feasibility Report. Discussions relative to Concern Number 6 are equally appropriate for this concern. The most recent estimate, based on October 1998 price levels, was prepared to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 2,350,000 cubic yards of material would be dredged during the initial construction as shown in Table II-3. These cost estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the water main and turning basin items also include engineering and design and supervision and administration costs since these are totally a non-Federal responsibility. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-16. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 12

Item	Amount (\$1,000)
Dredge Southern Branch Channel (Upper Reach)	12,220
Craney Island tolls	<u>2,700</u>
Subtotal	14,920
Engineering and design (2%)	298
Supervision and administration (4%)	<u>597</u>
Total	15,815
Relocate/replace 42-inch water main	3,615
Acquire land for turning basin	<u>1,000</u>
Total	4,615
Grand total	20,430

Operation and Maintenance Costs

The incremental increase in average annual operation and maintenance costs, based on the maintenance cycles and cubic yardage as shown in Table II-3, is estimated to be \$200,000 at October 1998 price levels.

Benefits

Discussion of monetary benefits included for Concern Number 6 is also appropriate for this concern. The values from the 1980 Feasibility Report were updated by indexing to October 1988 price levels for the Plan of Action for Engineering and Design Report dated May 1988, which indicated an average annual benefit of

\$31 million. The update, however, did not reflect the potential effects of changes in commodities or quantities of commodities, which are currently transported on the channel. Due to possible changes in commodities, vessel sizes, and operating practices, it will be necessary to reevaluate the transportation savings, which would accrue to a 40-foot-deep channel prior to construction to affirm economic justification.

Environmental Impacts

The discussion of environmental impacts relative to Concern Number 6 are equally applicable to this concern. Although all NEPA and related requirements have been fully satisfied, they will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 40-foot element is part of the Norfolk Harbor and Channels project. Discussions included for Concern Number 6 are also applicable to this concern. There are also funding requirements for project implementation from the City of Norfolk and private pier facility owners and operators. Non-Federal activities in the waters of the United States or wetlands to implement this concern would require authorizations from the Norfolk District Regulatory Branch.

Operation and Maintenance. Discussions included for Concerns Number 6 are also applicable to Concern Number 12.

Cost Sharing

Discussions included for Concerns Number 6 and 10 (tie) (the Southern Branch concern) are also applicable to this concern. The following table shows the apportionment of Federal and non-Federal construction costs.

Table V-17. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 12

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Southern Branch Channel (Upper Reach)	12,220	7,943.0	4,277.0
Craney Island tolls	<u>2,700</u>	<u>1,755.0</u>	<u>945.0</u>
Subtotal	14,920	9,698.0	5,222.0
Engineering and design (2%)	298	193.7	104.3
Supervision and administration (4%)	<u>597</u>	<u>388.1</u>	<u>208.9</u>
Total	15,815	10,279.8	5,535.2
Relocate/replace 42-inch water Main	3,615	0.0	3,615.0
Acquire land for turning basin	<u>1,000</u>	<u>0.0</u>	<u>1,000.0</u>
Total	4,615	0.0	4,615.0
Grand total	20,430	10,279.8	10,150.2

CONCLUSIONS

This concern appears to have merit and should be investigated in further detail. It will be considered for combination with appropriate prioritized concerns in Section VI.

CONCERN NUMBER 13

WATER QUALITY

DESCRIPTION

The quality of water in the Hampton Roads harbor area has been identified as a concern by stakeholders. The area surrounding the harbor includes a variety of uses including residential, agricultural, commercial, industrial, and military. Thousands of vessels ranging from cargo ships and navy craft to small commercial fishing boats and pleasure boats make annual use of the harbor. Many years of intensive industrial and military use have added to the deteriorated water quality. As discussed in Section IV, stakeholders identified several specific actions, which could potentially assist in the improvement of water quality in the port. These concerns include actions related to disposal of on-board waste, especially with respect to recreational boats and marinas; the elimination of direct pumping of bilge water into the harbor; better design of container and breakbulk cargo facilities to reduce water quality problems; elimination of "prop" dredging; and proper handling of contaminated dredged material.

PROPOSED ACTION

Water quality concerns within the port are currently being addressed by existing Federal, state, and local programs. Section I discusses a number of the regulatory, environmental, and other related requirements that are now in place within the harbor. These programs for correcting deteriorating water quality include managing surface runoff; monitoring water quality, so that trends can be established; enforcing water quality regulations; and endorsing of existing Federal and state programs to preserve, maintain, and improve water quality on a regional scale. Existing regulations need to be clearly defined and widely disseminated with timely follow-up and enforcement. The specific actions listed previously would require the cooperation and strict compliance with existing regulations by those individuals, companies, and agencies involved in the specific activities the concern is directed towards. Section III discusses two studies by the Army Corps of Engineers, the Elizabeth River Environmental Restoration Study and

the proposed Lynnhaven River Restoration Study, which will assist in addressing water quality problems in the area.

PLAN ACCOMPLISHMENTS

Improving the water quality within the Hampton Roads harbor would be an important aspect of restoring the environmental conditions of the port. The harbor and its surrounding waters are an important sub-estuary of the Chesapeake Bay, and their improvement would assist in reversing the decline in the vitality of living resources in the Chesapeake Bay through water quality protection.

DIVISION OF PLAN RESPONSIBILITY

The Virginia DEQ is responsible for developing and implementing policies, programs, and procedures to assure the proper use and management of the Commonwealth's water resources. The Water Division of the Virginia DEQ has permitting programs associated with toxic reductions to Virginia water including the Water Quality Standards (VR 680-21-00), the Virginia Pollution Discharge Elimination System (VPDES), the Toxics Management Regulation (VR 680-14-03), the Virginia Pollution Abatement Permits, and the VWPP. Nonpoint source programs include the Stormwater Management Regulations, the Underground Storage Tank Regulations, the Pesticide Management Program, and the Solid and Hazardous Waste Management Programs. The Air Quality Program, which is administered by the Air Division of the Virginia DEQ, monitors and regulates toxics released to the air that are also deposited in the watershed. These and other Virginia programs are described in the following table. Please also reference Appendixes D and H.

Table V-18. WATER QUALITY PROTECTION PROGRAMS IN VIRGINIA

Management program	Oversight agency	Program intent
Water Quality Standards (VR 680-21-00)	DEQ - Water Division	Provides both qualitative descriptions and numeric limits for specific physical, chemical, biological, and radiological characteristics of both surface waters and groundwater. Regulates mixing zones associated with point source discharges. Includes protection of wetlands along with Virginia's waters.
Virginia Pollutant Discharge Elimination System (VPDES) (VR 680-14-01)	DEQ - Water Division	Controls industrial and municipal waste discharges to surface waters. Include numeric effluent limitations, as well as self-monitoring and reporting requirements. Best management practice measures required as part of VPDES program.
Toxics Management Regulation (VR 680-14-03)	DEQ - Water Division	Provides guidelines for the administration and implementation of the Toxics Management Program. Controls the input of toxic pollutants to surface waters from point source discharges.
Virginia Pollution Abatement Permits (VR 680-14-01)	DEQ - Water Division	Applies to waste management facilities and operations that do not directly discharge to surface waters. Issued for land application of sewage sludge, animal waste, and industrial waste.
VWPP	DEQ - Water Division	Clean Water Act Section 401 Certification. Ensures that projects with Federal approval will have no adverse effect on water quality or existing beneficial uses of Virginia's waters.
Pretreatment Program	Hampton Roads Sanitation District (HRSD)	Regulates the "non-domestic" users that discharge toxic or unusually strong conventional waste to publicly owned treatment works. HRSD is responsible for controlling the industrial users under the program.

Table V-18. WATER QUALITY PROTECTION PROGRAMS IN VIRGINIA
(Cont'd)

<u>Management program</u>	<u>Oversight agency</u>	<u>Program intent</u>
Erosion and Sediment Control Regulations (VR 625-02-00)	Department of Conservation and Recreation	Establishes soil conservation requirements for land-disturbing activities associated with new construction.
Pesticide Management Program (VR 115-04-03)	Virginia Pesticide Control Board	Regulates pesticide use and the protection of human health and environment from unreasonable effects.
Hazardous Waste Management Program (VR 672-10-1)	DEQ - Waste Division	Regulates disposal of hazardous waste and encourages development of waste management programs. Provides for control of all hazardous wastes that are generated in or transported to Virginia. Limits uncontrolled release of hazardous substances to the environment.
Solid Waste Management Program (VR 672-20-10)	DEQ - Waste Division	Regulates management of open dumps and unpermitted facilities, solid waste disposal facility standards, permitting of solid waste management facilities, and special wastes.
Chesapeake Bay Preservation Act	Chesapeake Bay Local Assistance Department and Chesapeake Bay Local Assistance Board	Develops regulations that reverse the decline in the vitality of living resources in the Chesapeake Bay through water quality protection. Local government administered land use controls and stormwater management.

CONCLUSIONS

The improvement of water quality and other environmental preservation actions is an important aspect of port operations, use, and maintenance. It is imperative that all water quality and other environmental requirements are complied with by private and governmental interests in the implementation of actions considered in this Navigation Management Plan. These requirements have been discussed as they relate to each concern and will be carried forward to the next section for incorporation into the long-range, comprehensive planning strategy for the port.

CONCERN NUMBER 14

CHANNEL TO NEWPORT NEWS: NEED TO DEEPEN THE INBOUND LANE FROM 50 FEET TO THE AUTHORIZED DEPTH OF 55 FEET

DESCRIPTION

This concern expresses a need to deepen the elements of the inbound lane of the Channel to Newport News from their currently maintained depth of 50 feet to the authorized depth of 55 feet. The 55-foot inbound channel is a separable element of the Norfolk Harbor and Channels project authorized by the WRDA 86. This concern, identified by stakeholders and prioritized by Circle "A" members, is related to improvements to inbound navigation on the northside of the Hampton Roads harbor.

PROPOSED ACTION

The proposed action necessary to address this concern is similar to that required for Concern Number 9, deepening the outbound lane of the Channel to Newport News to 55 feet. The inbound lane would be deepened over its fully authorized width of 800 feet; therefore, there would be no need to consider the outbound lane separately. Of course, the inbound lanes of the approach channels would be dredged, rather than the outbound lanes, as in Concern Number 9.

PLAN ACCOMPLISHMENTS

Plan accomplishments would be the same as those described previously for the inbound lanes of the Norfolk Harbor Channel, Concerns Number 5 and 7 (tie) (the Norfolk Harbor Channel concern), except they would accrue to the northside of the port.

ANALYSES

As in the case of Concerns Number 5 and 7 (tie) (the Norfolk Harbor Channel concern), there have been no separate economic evaluations made of the 55-foot inbound channel element. Discussions contained relative to Concern Number 5 are equally appropriate for this concern. The most recent estimate, based on October 1998 price levels, was prepared to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 26.2 million cubic yards of material would be dredged during the initial construction as shown in Table II-3. The costs for this specific concern are based on estimates prepared for the entire 55-foot outbound channel element. Some of these values would be modified if this concern were accomplished separately from the total 55-foot outbound channel project. It is not very likely that this concern would be implemented prior to the implementation of Concern Number 9, as described in Section VI. Accordingly, it is not considered warranted to expend time and resources to prepare a separate detailed cost estimate for this concern, assuming Concern Number 9 is not in place. However, using readily available information, it is possible to develop a reasonable, preliminary estimate for the cost of constructing Concern Number 14 as a "stand alone" increment that is presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the tunnel cover item also includes engineering and design and supervision and administration costs since these are totally a non-Federal responsibility. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user)

are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-19. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 14

Item	Amount (\$1,000)
Dredge Atlantic Ocean Channel	16,276
Dredge Thimble Shoal Channel	26,068
Dredge Channel to Newport News	26,144
Dredge Hampton Roads Anchorage F (1)	9,510
Dredge Sewells Point Anchorage	18,141
Remove wrecks	<u>868</u>
Subtotal	97,007
Engineering and design (2%)	1,940
Supervision and administration (4%)	<u>3,880</u>
Total	102,827
Construct Thimble Shoal tunnel cover	<u>4,184</u>
Grand total	107,011

(1) Please see anchorage designations for (F), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

Operation and Maintenance Costs

As indicated in Concern Number 9, the incremental increase in average annual operation and maintenance costs, is estimated to be \$700,000 at October 1998 price levels.

Benefits

The discussion of benefits for this concern is similar to that previously presented for Concerns Number 5 and 7 (tie) (the Norfolk Harbor Channel concern) except that these beneficial impacts would accrue to the northside of the port. As stated in Concern Number 7 (tie), container ships with a potential loaded draft of 47.5 feet have already called at the port, and even larger ships are expected. Industry experts expect an increasing amount of containerized cargo to move in these mega ships in the future. A 55-foot-deep inbound channel would permit appropriate under-keel clearance for these larger ships and would provide for more efficient and safe navigation.

Environmental Impacts

Substantial environmental studies were accomplished during the period from 1982 to 1985 by Federal agencies, state and university research laboratories, and private contractors under provisions of PL 99-88, as described previously for the 55-foot-deep outbound lane of the Norfolk Harbor and Channels project (Concern Number 2). All NEPA and related documentation have been fully satisfied but will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 55-foot inbound element is part of the Norfolk Harbor and Channels project. Discussions included for Concern Number 9 are also applicable to this concern.

Operation and Maintenance. Discussions included for Concern Number 9 are also applicable to Concern Number 14.

Cost Sharing

Discussions included for Concern Number 9 are also applicable to this concern. The following table shows the apportionment of Federal and non-Federal construction

costs. The incremental increase in average annual operation and maintenance costs associated with this element is estimated at \$700,000, of which \$350,000 would be a Federal responsibility and \$350,000 a non-Federal responsibility.

Table V-20. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 14

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Atlantic Ocean Channel	16,276	6,510.4	9,765.6
Dredge Thimble Shoal Channel	26,068	10,427.2	15,640.8
Dredge Channel to Newport News	26,144	10,457.6	15,686.4
Dredge Hampton Roads Anchorage F (1)	9,510	3,804.0	5,706.0
Dredge Sewells Point Anchorage	18,141	7,256.4	10,884.6
Remove wrecks	<u>868</u>	<u>347.2</u>	<u>520.8</u>
Subtotal	97,007	38,802.8	58,204.2
Engineering and design (2%)	1,940	776.0	1,164.0
Supervision and administration (4%)	<u>3,880</u>	<u>1,552.0</u>	<u>2,328.0</u>
Total	102,827	41,130.8	61,696.2
Construct Thimble Shoal tunnel cover	<u>4,184</u>	<u>0.0</u>	<u>4,184.0</u>
Grand total	107,011	41,130.8	65,880.2

(1) Please see anchorage designations for (F), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

CONCLUSIONS

This concern relates only to the northside of the Hampton Roads harbor and does not include all of the elements of the 55-foot inbound channel project; specifically, most of the Norfolk Harbor Channel. Also, it is related to Concerns Number 7 (tie) (the Norfolk Harbor Channel concern) and 9, since the resolution of these two concerns would fully address Concern Number 14. Concern Number 7 (tie) would provide for the deepening of all of the inbound channel elements needed for this concern, except for the Channel to Newport News element. Concern Number 9 requires the deepening of the outbound channel element of the Channel to Newport News and, since the outbound channel would be dredged over its fully authorized width of 800 feet, there would be no additional dredging required for the inbound channel element.

CONCERN NUMBER 15

NEED TO DEEPEN THE ENTIRE EASTERNMOST ANCHORAGE AREA OPPOSITE SEWELLS POINT (K-1) AND A SMALL SECTION OF CHANNEL TO 55 FEET TO PROVIDE EASIER TRANSIT BETWEEN THE NORFOLK HARBOR CHANNEL AND THE CHANNEL TO NEWPORT NEWS; IN ADDITION, THE K-1 ANCHORAGE WOULD NEED TO BE RELOCATED

DESCRIPTION

This concern expresses a need to deepen the K-1 Anchorage to 55 feet, including a small section of the Norfolk Harbor Channel adjacent to the anchorage area. Also included is a small area, adjacent to the K-1 Anchorage, known as the Naval Maneuvering Area.

PROPOSED ACTION

In the case of this concern, it must be assumed that Concern Number 10 (tie) (the K-1 concern) has already been constructed. Indeed, this concern is identical to Concern Number 10 (tie), except that the depth would be increased from 50 feet to 55 feet rather than 45 feet to 50 feet. The discussions included under Concern Number 10 (tie) are equally applicable for this concern; however, the provision of a 55-foot depth would not

be appropriate unless and until the authorized depth of 55 feet is provided for the Hampton Roads harbor.

PLAN ACCOMPLISHMENTS

A depth of 55 feet would provide safe and efficient maneuvering between channels for the largest bulk coal carriers and container ships and would be commensurate with deepening of the Hampton Roads harbor channels to the authorized depth of 55 feet.

ANALYSES

There have been no economic evaluations made for this specific concern, although initial costs have been estimated to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 3.1 million cubic yards of material would be dredged during the initial construction. Unlike the deepening elements discussed earlier, no studies or preliminary design have been conducted on this improvement, previous to its being included as part of the Navigation Management Plan. The estimates presented in the following table are for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. The costs for aids to navigation (the responsibility of the Coast Guard) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-21. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 15

<u>Item</u>	<u>Amount (\$1,000)</u>
Dredge K-1 Anchorage (1)	17,577
Engineering and design (2%)	352
Supervision and administration (4%)	<u>703</u>
Total	18,632

(1) Please see anchorage designations for (K-1), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

Operation and Maintenance Costs

It is estimated that there would be an average annual increase of 60,000 cubic yards in dredged material removed to support the maintenance in this area over the existing depths. The incremental increase in average annual operation and maintenance costs, based on this additional quantity of dredged material, is estimated to be \$240,000 at October 1998 price levels.

Benefits

The discussion of benefits contained under Concern Number 10 (tie) (the K-1 concern) are equally applicable here. The additional 5 feet of depth over that proposed for Concern Number 10 (tie) would permit the largest bulk coal carriers and container ships to safely and efficiently maneuver the turn area.

Environmental Impacts

All NEPA and related requirements will be fully satisfied prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. The deepening of the K-1 Anchorage, a small part of the Norfolk Harbor Channel, and the Naval Maneuvering Area to 55 feet would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA.

Operation and Maintenance. Once constructed, maintenance dredging of the additional depth would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth.

Cost Sharing

The cost-sharing requirements for this work are based on the provisions of the WRDA's 86 and 88 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs. The incremental increase in average annual operation and maintenance costs associated with this project is estimated at \$240,000, of which \$120,000 would be a Federal responsibility and \$120,000 a non-Federal responsibility.

Table V-22. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 15

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge K-1 Anchorage (1)	17,577	7,030.8	10,546.2
Engineering and design (2%)	352	140.8	211.2
Supervision and administration (4%)	<u>703</u>	<u>281.2</u>	<u>421.8</u>
Total	18,632	7,452.8	11,179.2

(1) Please see anchorage designations for (K-1), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

CONCLUSIONS

The implementation of this concern is contingent upon the assumption that, at a minimum, Concerns Number 10 (tie) (the K-1 concern); 2 or 7 (tie) (the Norfolk Harbor Channel concern); and 9 or 14 have been provided. It is directly related to these five concerns. The concern, however, has substantial merit and will be so considered in Section VI.