



U.S. Army Corps of Engineers
Charleston District

APPENDIX D

CHARLESTON HARBOR POST 45
CHARLESTON, SOUTH CAROLINA

Cost Engineering

03 October 2014

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NAVIGATION STUDY FOR CHARLESTON HARBOR, SOUTH CAROLINA

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D. COST ESTIMATES AND RISK ANALYSIS

D1. GENERAL INFORMATION

US Army Corps of Engineers' cost estimates for planning purposes are prepared in accordance with the following guidance:

- Engineer Technical Letter (ETL) 1110-2-573, Construction Cost Estimating Guide for Civil Works, 30 September 2008
- Engineer Regulation (ER) 1110-1-1300, Cost Engineering Policy and General Requirements, 26 March 1993
- ER 1110-2-1302, Civil Works Cost Engineering, 15 September 2008
- ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 August 1999
- ER 1105-2-100, Planning Guidance Notebook, 22 April 2000, as amended
- Engineer Manual (EM) 1110-2-1304 (Tables Revised 31 March 2012), Civil Works Construction Cost Index System, 31 March 2000
- CECW-CP Memorandum for Distribution, Subject: Initiatives to Improve the Accuracy of Total Project Costs in Civil Works Feasibility Studies Requiring Congressional Authorization, 19 September 2007
- CECW-CE Memorandum for Distribution, Subject: Application of Cost Risk Analysis Methods to Develop Contingencies for Civil Works Total Project Costs, 3 July 2007
- Cost and Schedule Risk Analysis Process, March 2008

The goal of the cost estimates for the Charleston Harbor Post 45 Phase II Feasibility Study for the shipping harbor located in Charleston, South Carolina is to present a Total Project Cost (Construction and Non-Construction costs) for the National Economic Development (NED) plan and the Locally Preferred Plan (LPP) at the current price level to be used for project justification/authorization. In addition, the costing efforts are intended to produce a final product (cost estimate) that is reliable and accurate, and that supports the definition of the Government's and the Non-Federal sponsor's obligations.

The cost estimating effort for the study also yielded a series of alternative plan formulation cost estimates for decision making. The cost estimates supporting the NED plan and LPP are prepared in Micro-computer Aided Cost Estimating System version II (MCACES/MII) format to the CWWBS sub-feature level. These estimates are supported by the preferred labor, equipment, materials and crew/production breakdown. An Abbreviated Risk Analysis (ARA) is included that addresses project uncertainties and sets contingencies for each plan's cost items. A full Cost and Schedule Risk Analysis (CSRA) will be performed prior to issue of the final Feasibility Report.

D.1.1 Recommended Alternative Plans

The final NED plan and LPP resulted directly from the plan formulation process described above. The Economics Appendix (Appendix C) fully describes the plan selection process based upon the plan that maximizes the net benefits while considering the significance of the change in cost between alternative plans. The NED plan selected by USACE HQ is the 50'/48' plan (see Section D.2.1 for more details of this plan). The local Sponsor has selected to pursue an LPP which is the 52'/48' plan (see Section D.2.2 for more details of this plan). The scopes of work for the NED plan and LPP are found in the main report and Engineering Appendix (Appendix A). The MCACES/MII cost estimates are based on the scopes and are formatted in the CWWBS. The notes provided in the body of the estimate detail the estimate parameters and assumptions. These include pricing at the Fiscal Year 2014 price level (1 October 2013-30 September 2014).

The construction costs fall under the following feature codes:

- 06 Fish and Wildlife Facilities
- 11 Levees and Floodwalls
- 12 Navigation Ports and Harbors

The non-construction costs fall under the following feature codes:

- 01 Lands and Damages
- 02 Relocations
- 30 Planning, Engineering and Design
- 31 Construction Management

D.1.2 Construction Cost

Construction costs were developed in MCACES/MII and include all major project components categorized under the appropriate CWWBS to the sub- feature level. The construction costs for dredging operations were developed using the Corps of Engineers Dredge Estimating Program (CEDEP) and then transferred into the MCACES/MII estimates. Total Project Costs on each plan contain contingencies that were determined as a result of the abbreviated risk analysis. Additional information follows on the risk analysis.

D.1.3 Non-construction Cost

Non-construction costs typically include Lands and Damages (Real Estate), Planning Engineering & Design (PED) and Construction Management Costs (Supervision & Administration, S&A). These costs were provided by the PDT either as a lump sum cost or as a percentage of the total

Construction Contract Cost. Lands and Damages cover the potential real estate purchase to mitigate for wetland impacts. An average cost per acre was provided by the Savannah Real Estate Branch and are best described in the Real Estate Appendix (Appendix E). PED costs for the preparation of contract plans and specifications (P&S) have been provided by the project manager and include additional studies, such as ship simulation and environmental surveys, which were not performed during feasibility in accordance with the requirements of the 3X3X3 methodology for feasibility studies. Construction Management costs are for the supervision and administration of the contracts required to perform the various aspects of construction required for this project and includes Project Management, Construction Quality Assurance and Contract Administration costs. These costs were provided by the project manager with input from the Chief of Construction and are included as a percentage of the total construction contract cost.

In addition to the typical non-construction costs, this project also includes a Relocations cost for the relocation of aids to navigation, as well as non-construction Fish and Wildlife Facilities costs for the establishment of post construction monitoring for environmental mitigation measures.

The main report details both cost allocation and cost apportionment for the Federal Government and the Non-Federal Sponsor. Also included in the main report are the Non-Federal Sponsor's obligations (items of local cooperation).

D.1.4 Plan Formulation Cost Estimates

For the plan formulation cost estimates, unit prices for dredging related work were developed in the Corps of Engineers Dredge Estimating Program (CEDEP) and then entered into MCACES/MII. Unit prices for the remaining major or variable construction elements were developed in MCACES/MII based on input from the PDT. Design details, information and assumptions are provided in the notes of the MCACES/MII estimates for each alternative. Plan formulation alternatives and cost estimates include advanced maintenance at the same rate for advanced maintenance as the existing 45' project, except for the seaward section of the entrance channel which does not include any advanced maintenance, but does include 1' of required over depth in order to maintain additional under keel clearance in areas where rock is present.

Refer to Economics Section in the main report for final plan formulation cost tables including the calculation of net benefits and benefit to cost ratios for the NED plan and the LPP.

D.1.5 Annual Costs

Estimates for increases in annual costs for O&M dredging due to increased shoaling and increased maintenance for aids to navigation due to the deepening of the harbor were calculated for economic analysis. The increase in maintenance costs for the aids to navigation were provided by the USCG. The increase in O&M dredging quantities for the new project, either NED or LPP, were calculated from models of the hydrodynamic properties and provided by H&H engineering. These quantities were then used with an average cost per cubic yard for the affected reaches. The unit cost was used with the assumption that the mobilization costs were already covered in the current plan for dredging the existing channel. Table D-1 shows the annual cost increases due to increased shoaling for each of the plans, NED and LPP.

Table D-1 Increased Shoaling Annual Costs

Plan	Shoaling Qty	Delta Qty	Cost Increase
Existing Condition	1,452,935 CY	--	--
NED	2,156,377 CY	703,442 CY	\$3,517,210
LPP	2,171,467 CY	718,532 CY	\$3,592,660

D.1.6 Construction Schedule

Construction schedules for the NED plan and the LPP were prepared utilizing input from the PDT and reflect all project construction components. The schedule considers not only durations of individual components of construction, but also the timing of construction contracts based on the assumption of unconstrained funding. Each of the construction schedules was combined with the project schedule to create an overall schedule that was used for the generation of the Total Project Cost.

The construction schedule will change as the project moves through the various project lifecycle phases. The overall project schedules are provided in this Appendix.

D2. PLAN FORMULATION COST ESTIMATES

D.2.1 Alternative 1 - 50/48 Estimate

The MII estimate for this alternative is considered "For Official Use Only" (FOUO). Therefore, it is available to government personnel only upon request. This plan is based on an authorized channel with the following characteristics: 52' Entrance Channel, 50' Main Channel providing access to the Wando Welch and Former Navy Base terminals, 48' Channel from the Former Navy Base terminal to the North Charleston terminal. This estimate includes improvements

to three inland disposals areas (DA), Yellowhouse Creek DA, Clouter Creek DA and Daniel Island DA. In addition, environmental mitigation and monitoring, changes to aids to navigation, PED and Construction S&A are included in the estimate. For a complete cost impact, Sponsor related costs to improve the wharf at the Wando Welch terminal and to deepen the berthing facilities at the Wando Welch (50'), Former Navy Base (50') and North Charleston (48') terminals are included in the cost estimate for this alternative and added as separate costs with responsibility only to the Sponsor in the Total Project Cost Summary.

D.2.2 Alternative 2 - 52/48 Estimate

The MII estimate for this alternative is considered "For Official Use Only" (FOUO). Therefore, it is available to government personnel only upon request. This plan is based on an authorized channel with the following characteristics: 54' Entrance Channel, 52' Main Channel providing access to the Wando Welch and Former Navy Base terminals, 48' Channel from the Former Navy Base terminal to the North Charleston terminal. This estimate includes improvements to three inland disposals areas, Yellowhouse Creek DA, Clouter Creek DA and Daniel Island DA. In addition, environmental mitigation and monitoring, changes to aids to navigation, PED and Construction S&A are included in the estimate. For a complete cost impact, Sponsor related costs to improve the wharf at the Wando Welch terminal and to deepen the berthing facilities at the Wando Welch (52'), Former Navy Base (52') and North Charleston (48') terminals are included in the cost estimate for this alternative and added as separate costs with responsibility only to the Sponsor in the Total Project Cost Summary.

D3. NED and LPP COST ESTIMATES

Cost estimates in summary form are contained in Table D-2 of this Appendix.

Table D-2 – Base Costs for NED Plan and LPP for WBS Features

Feature	Base Cost Estimate (2014 Cost Level Excludes Contingency)
NED Plan – 52' EC, 50' to WWT & NBT, 48' to NCT	
Wildlife Facilities & Sanctuary (Mitigation for hard bottom & Monitoring)	\$ 69,752,000
Levees & Floodwalls (Inland Disposal Area Improvements)	\$ 11,881,000
Navigation Ports & Harbors (Dredging)	\$ 242,911,000
Lands and Damages (for Wetland Mitigation)	\$ 2,746,000

Relocations (Aids to Navigation)	\$ 522,000
Planning Engineering and Design	\$ 4,720,000
Construction Management	\$ 4,876,000
Sponsor Costs (Wharf Improvements & Berth Area Dredging)	\$ 25,823,000
Total Cost	\$ 363,231,000
LPP - 54' EC, 52' to WWT & NBT, 48' to NCT	
Wildlife Facilities & Sanctuary (Mitigation & Monitoring)	\$ 69,752,000
Levees & Floodwalls (Inland Disposal Area Improvements)	\$ 11,881,000
Navigation Ports & Harbors (Dredging)	\$ 302,734,000
Lands and Damages	\$ 3,800,000
Relocations (Aids to Navigation)	\$ 522,000
Planning Engineering and Design	\$ 4,720,000
Construction Management	\$ 5,773,000
Sponsor Costs (Wharf Improvements & Berth Area Dredging)	\$ 26,154,000
Total Cost	\$ 425,336,000

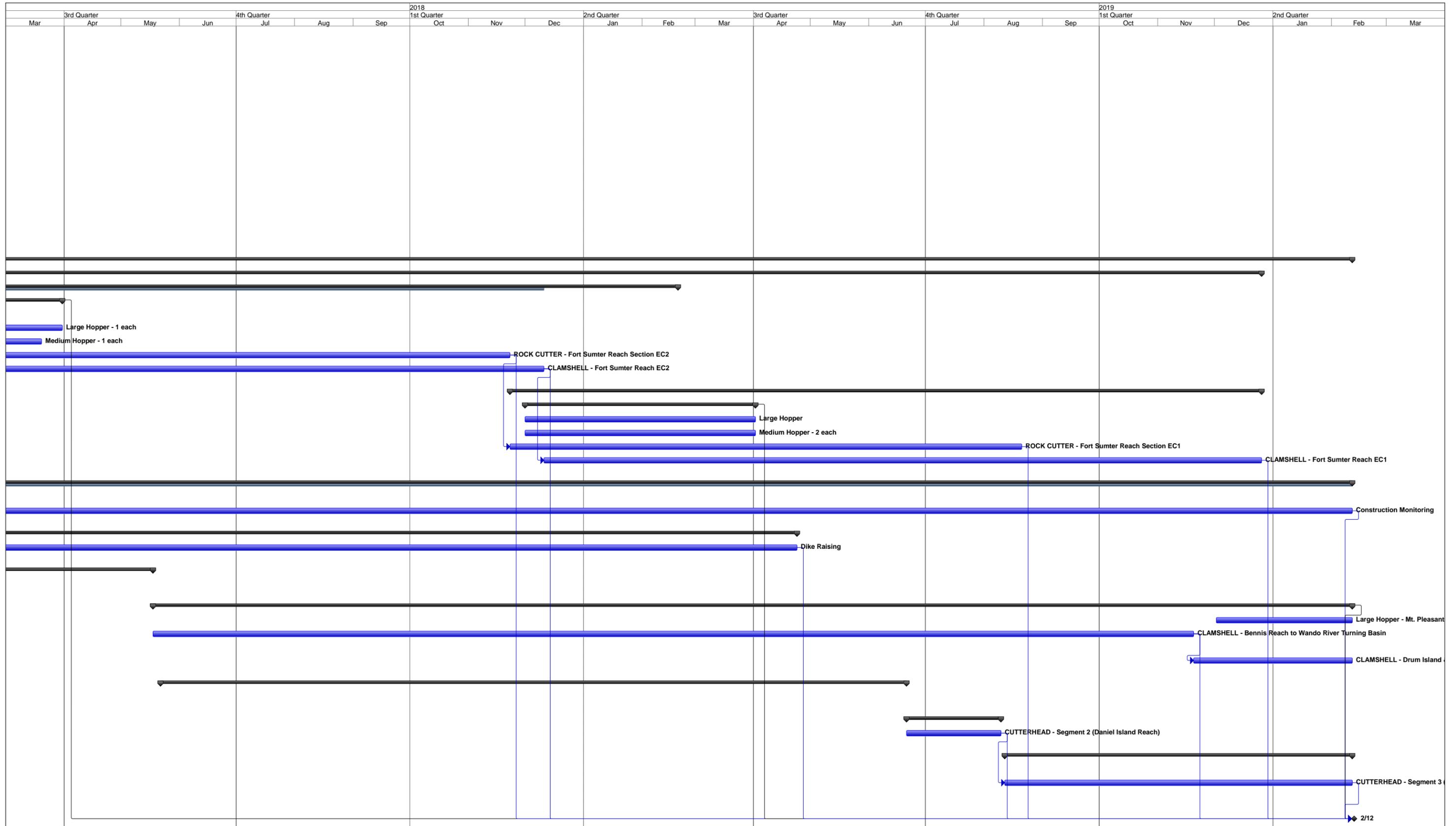
D4. SCHEDULES for NED PLAN and LPP

Schedules for the NED Plan and the LPP are contained on the following pages of this Appendix.



Project: NED PED & Construction Sch
Date: Tue 8/26/14

Task	Summary	External Milestone	Inactive Summary	Manual Summary Rollup	Finish-only	Deadline
Split	Project Summary	Inactive Task	Manual Task	Manual Summary	Progress	Deadline
Milestone	External Tasks	Inactive Milestone	Duration-only	Start-only	Deadline	Milestone



Project: NED PED & Construction Sch
Date: Tue 8/26/14

Task	Summary	External Milestone	Inactive Task	Inactive Milestone	Inactive Summary	Manual Task	Manual Summary	Manual Summary Rollup	Finish-only	Progress	Deadline
Split	Project Summary	Inactive Task	Inactive Milestone	Inactive Summary	Manual Task	Manual Summary	Manual Summary Rollup	Manual Summary	Finish-only	Progress	Deadline
Milestone	External Tasks	Inactive Task	Inactive Milestone	Inactive Summary	Manual Task	Manual Summary	Manual Summary Rollup	Manual Summary	Finish-only	Progress	Deadline

ID	Task Name	Notes/Assumptions	Duration	Start	Finish	2015													
						2nd Quarter			3rd Quarter			4th Quarter			1st Quarter			2nd Quarter	
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1	PED Phase		633 days	Fri 3/6/15	Tue 8/8/17														
2	PED Investigations & Report		270 days	Fri 3/6/15	Thu 3/17/16														
3	Monitoring Contract		223 days	Wed 7/13/16	Fri 5/19/17														
4	Plans & Specs		159 days	Wed 7/13/16	Mon 2/20/17														
26	Contracting		64 days	Tue 2/21/17	Fri 5/19/17														
36																			
37	Mitigation Contract		363 days	Fri 3/18/16	Tue 8/8/17														
38	Plans & Specs		299 days	Fri 3/18/16	Wed 5/10/17														
61	Contracting		64 days	Thu 5/11/17	Tue 8/8/17														
72																			
73	Dike Raising Contract		289 days	Fri 3/18/16	Wed 4/26/17														
74	Plans & Specs		224 days	Fri 3/18/16	Wed 1/25/17														
99	Contracting		65 days	Thu 1/26/17	Wed 4/26/17														
110																			
111	Entrance Channel Contract		240 days	Wed 7/6/16	Tue 6/6/17														
112	Plans & Specs		200 days	Wed 7/6/16	Tue 4/11/17														
140	Contracting		65 days	Wed 3/8/17	Tue 6/6/17														
152																			
153	Construction Phase		733 days	Thu 4/27/17	Thu 2/13/20														
154	Entrance Channel - Both Sections		556 days	Fri 12/1/17	Wed 1/15/20														
155	Entrance Channel - Section EC2		320 days	Fri 12/1/17	Tue 2/19/19														
156	HOPPER - Fort Sumter Reach Section EC2	Mob time built into duration between Award and Construction Start	81 days	Fri 12/1/17	Fri 3/23/18														
157	Large Hopper - 1 each		77 days	Fri 12/1/17	Mon 3/19/18														
158	Medium Hopper - 1 each		81 days	Fri 12/1/17	Fri 3/23/18														
159	ROCK CUTTER - Fort Sumter Reach Section EC2	30 days from NTP to Construction beginning	320 days	Fri 12/1/17	Tue 2/19/19														
160	CLAMSHELL - Fort Sumter Reach EC2	30 days from NTP to Construction beginning	239 days	Fri 1/12/18	Mon 12/10/18														
161																			
162	Entrance Channel - Section EC1	Mob time built into duration between Award and Construction Start	294 days	Sat 12/1/18	Wed 1/15/20														
163	HOPPER - Fort Sumter Reach Section EC1		87 days	Sat 12/1/18	Mon 4/1/19														
164	Large Hopper		87 days	Sat 12/1/18	Mon 4/1/19														
165	Medium Hopper - 3 each		87 days	Sat 12/1/18	Mon 4/1/19														
166	ROCK CUTTER - Fort Sumter Reach Section EC1		236 days	Wed 2/20/19	Wed 1/15/20														
167	CLAMSHELL - Fort Sumter Reach EC1		272 days	Tue 12/11/18	Wed 12/25/19														
168																			
169	Monitoring Program		715 days	Mon 5/22/17	Wed 2/12/20														
170	Pre-Construction Monitoring Surveys		40 days	Mon 5/22/17	Fri 7/14/17														
171	Construction Monitoring		576 days	Fri 12/1/17	Wed 2/12/20														
172																			
173	Dike Raising Construction		521 days	Thu 4/27/17	Tue 4/23/19														
174	Dike Raising		521 days	Thu 4/27/17	Tue 4/23/19														
175																			
176	PLANS & SPECS Mt Pleasant Reach to Wando TB including Drum Island & Myers Bend		284 days	Wed 6/7/17	Fri 7/6/18														
216																			
217	Lower Harbor to Wando Turning Basin & Drum-Myers		420 days	Mon 7/9/18	Thu 2/13/20														
218	CLAMSHELL - Mt. Pleasant Reach to Wando River Turni	30 days from NTP to Construction beginning	360 days	Mon 7/9/18	Thu 11/21/19														
219	CLAMSHELL - Drum Island & Myers Bend		60 days	Fri 11/22/19	Thu 2/13/20														
220																			
221	PLANS & SPECS Segments 2 & 3 (Daniel Island Reach to Ordinance Turning Basin)		284 days	Mon 5/7/18	Wed 6/5/19														
261																			
262	Segment 2 (Daniel Island Reach)		48 days	Thu 6/6/19	Mon 8/12/19														
263	CUTTERHEAD - Segment 2 (Daniel Island Reach)	30 days from NTP to Construction beginning	48 days	Thu 6/6/19	Mon 8/12/19														
264																			
265	Segment 3 (Daniel Island Bend to Ordinance Turning Bas		132 days	Tue 8/13/19	Wed 2/12/20														
266	CUTTERHEAD - Segment 3 (Daniel Island Bend to Ordinance Turning Basin)		132 days	Tue 8/13/19	Wed 2/12/20														
267																			
268	END OF CONSTRUCTION		1 day?	Thu 2/13/20	Thu 2/13/20														

Project: LPP PED & Construction Schem
Date: Tue 8/26/14

Task	Summary	External Milestone	Inactive Summary	Manual Summary Rollup	Finish-only
Split	Project Summary	Inactive Task	Manual Task	Manual Summary	Progress
Milestone	External Tasks	Inactive Milestone	Duration-only	Start-only	Deadline



Project: LPP PED & Construction Sche
Date: Tue 8/26/14

Task	Summary	External Milestone	Inactive Summary	Manual Summary Rollup	Finish-only	Progress	Deadline
Split	Project Summary	Inactive Task	Manual Task	Manual Summary	Progress	Deadline	Milestone
Milestone	External Tasks	Inactive Milestone	Duration-only	Start-only	Progress	Deadline	Milestone



Project: LPP PED & Construction Sche
Date: Tue 8/26/14

Task	Summary	External Milestone	Inactive Summary	Manual Summary Rollup	Finish-only
Split	Project Summary	Inactive Task	Manual Task	Manual Summary	Progress
Milestone	External Tasks	Inactive Milestone	Duration-only	Start-only	Deadline

D5. RISK AND UNCERTAINTY ANALYSIS

An Abbreviated Risk Analysis was conducted according to the procedures outlined in the manual entitled; "Cost and Schedule Risk Analysis Process" dated March 2008. A full CSRA will be performed after the draft report goes out for review.

D.5.1 Risk Analysis Methods

The entire PDT participated in a cost risk analysis brainstorming session to identify risks associated with the recommended plan. The risks were listed in the risk register and evaluated by the PDT. Assumptions were made as to the likelihood and impact of each risk item, as well as the probability of occurrence and magnitude of the impact if it were to occur. Adjustments were made to the analysis accordingly and the final contingency was established. The contingency was applied to each alternative plan estimate in order to obtain the Total Project Cost.

D.5.2 General Information

Charleston Harbor, located in Charleston County, South Carolina is formed at the confluence of the Ashley, Cooper and Wando Rivers. The harbor flows directly into the Atlantic Ocean. Deep draft vessels transit Charleston Harbor from the Atlantic Ocean to one of three existing terminals and a new terminal that is under construction. The existing terminals are the Columbus Street Union Pier (main users are roll on/roll off transports and pre-Panamax vessels), the Wando Welch Container Terminal (main users are large post-Panamax container transport vessels) and the North Charleston Terminal (main users are bulk transport vessels). The Former Navy Base Terminal currently under construction will provide additional berthing and unloading/loading capabilities for large post-Panamax container transport vessels. Charleston Harbor has an authorized depth of 47 feet for the entrance channel and an authorized depth of 45 feet for the remainder of the Federal channel.

Charleston District is conducting a study to increase the depth of the existing Federal channel to the Wando Welch Terminal and the Former Navy Base Terminal from its current project depth of 45 feet to a maximum depth of 52 feet. In addition, the existing Federal channel from the Former Navy Base Terminal to the North Charleston Terminal will be deepened from its current project depth of 45 feet to a maximum depth of 48 feet. The entrance channel, due to vessel squat and added motion from wind and waves, will be deepened from its current depth to a maximum depth of 54 feet. The harbor project provides access to deep draft vessel traffic using terminal facilities located in Charleston. The study will evaluate navigation concerns and provide recommendations for investigating navigation improvements. The non-federal sponsor is the South Carolina State Ports Authority. The National Economic Development (NED) plan has been identified to be the 50'/48' plan. This is the plan that maximizes the net benefits while considering the significance of the change in cost between alternative plans. The local Sponsor has selected to

pursue a Locally Preferred Plan (LPP) which is the 52'/48' plan. The Tentatively Selected Plan (TSP) is the LPP, 52'/48' plan.

D.5.3 Risk Analysis Results

Refer to the printouts of the Abbreviated Risk Analysis in this report at the end of this section. The Risk Registers for the NED Plan and LPP are contained as attachments to this Appendix. A full Cost and Schedule Risk Analysis including Crystal Ball analysis and Risk Analysis Report will be generated for the TSP, following the selection of the TSP and review of the Draft Report.

D.5.4 Summary of Findings

Table D-3 provides the cost contingencies for the two alternative plans calculated from the abbreviated risk analysis. Contingency was quantified as approximately \$72 million for the 50/48 alternative and approximately \$84 million for the 52/48 alternative. Table D-4 provides additional breakdown of the cost and contingency by the various project components.

Table D-3 - Alternative Plans ARA

Alternative	Base Cost Estimate	Contingency (\$)	Contingency (%)
NED- 50/48	\$336,870,426	\$72,240,456	21%
LPP - 52/48	\$398,434,224	\$84,858,056	21%

The primary threats to the cost estimates identified by the CSRA process are listed below. These threats include both direct cost impacts and the cost impacts of schedule delays.

Industry Availability/Bidding Climate: Relatively large contract sizes may limit field of interested bidders and increase the uncertainty of future costs. Joint ventures will likely be necessary due to the size of the contracts required to perform this project in a timely manner. Schedule for this project could overlap with competing dredging projects which are preparing for New Post Panamax class ships. Ultimately, this uncertainty cannot be mitigated until more information is available on the schedule of work and the availability of qualified dredging contractors. This should be communicated to management, and an adequate amount of contingency should be reserved to capture this risk.

Rock and Dredge Material Quantities: There is uncertainty in the estimated quantity of rock and dredge material. Rock quantities are based on studies, including core borings with strength analysis. Underestimating rock quantity will result in additional costs. The PDT performed adequate surveys to

calculate quantities and feel confident in the rock quantity estimates. For other dredge materials, surveys should be performed periodically so that this item can be monitored. This item can be mitigated when final plans and specs surveys are done prior to solicitation of a contract.

Federal Incremental Funding: Future Federal funding levels are uncertain. Incremental funding is anticipated. Funding levels less than required to support the project schedule may result in additional years of work. Project Management needs to stay aware of the current project cost and schedule and ensure that estimates are updated yearly and economics verified on a routine basis until the project receives funding.

Environmental Work Windows and Productivity: If lower than anticipated construction productivity occurs, environmental windows may push work out to the next year for areas anticipated to require hopper dredging. Project Management needs to stay aware of the current project schedule and ensure that the schedule is updated and maintained.

Construction Management Duration: Additional construction management costs may be incurred if the construction duration is longer than assumed. Project Management needs to stay aware of the current project schedule and ensure that the schedule is updated and maintained.

Table D-4 - Recommended Contingency for WBS Features

Feature	Base Cost Estimate w/o Contingency (\$)	Recommended Contingency (\$)	Base Cost Estimate + Contingency (\$)
NED Plan – 50’/48’			
06 – Fish & Wildlife Facilities (Hard Bottom Mitigation & Monitoring)	\$ 69,752,000	\$ 14,648,000	\$ 84,400,000
11 – Levees & Floodwalls (Disposal Area Improvements)	\$ 11,881,000	\$ 2,495,000	\$ 14,376,000
12 - Navigation Ports & Harbors (Dredging)	\$ 242,911,000	\$ 51,011,000	\$ 293,922,000
01 - Lands and Damages	\$ 2,209,000	\$ 552,000	\$ 2,761,000
02 - Relocations (Aids to Navigation)	\$ 522,000	\$ 110,000	\$ 632,000
30 - Planning Engineering and Design	\$ 4,720,000	\$ 991,000	\$ 5,711,000
31 - Construction Management	\$ 4,876,000	\$ 1,024,000	\$ 5,900,000
Sponsor Costs (Terminal Improvements & dredging of berthing areas)	\$ 25,823,000	\$ 803,000	\$ 26,626,000
Total Cost			\$ 434,328,000
LPP – 52’/48’			
06 – Fish & Wildlife Facilities (Mitigation & Monitoring)	\$ 69,752,000	\$ 14,648,000	\$ 84,400,000
11 – Levees & Floodwalls (Disposal Area Improvements)	\$ 11,881,000	\$ 2,495,000	\$ 14,376,000

12 - Navigation Ports & Harbors (Dredging)	<i>\$ 302,734,000</i>	<i>\$ 63,574,000</i>	<i>\$ 366,308,000</i>
01 - Lands and Damages	<i>\$ 3,052,000</i>	<i>\$ 763,000</i>	<i>\$ 3,815,000</i>
02 - Relocations (Aids to Navigation)	<i>\$ 522,000</i>	<i>\$ 110,000</i>	<i>\$ 632,000</i>
30 - Planning Engineering and Design	<i>\$ 4,720,000</i>	<i>\$ 991,000</i>	<i>\$ 5,711,000</i>
31 - Construction Management	<i>\$ 5,773,000</i>	<i>\$ 1,212,000</i>	<i>\$ 6,985,000</i>
Sponsor Costs (Terminal Improvements & dredging of berthing areas)	<i>\$ 26,154,000</i>	<i>\$ 872,000</i>	<i>\$ 27,026,000</i>
Total Cost			<i>\$ 509,253,000</i>

Abbreviated Risk Analysis

Project (less than \$40M): **Charleston Harbor Deepening**
 Project Development Stage/Alternative: **Feasibility (Alternatives)**
 Risk Category: **Moderate Risk: Typical Project or Possible Life Safety**

Alternative: **NED Plan - 50/48**

Meeting Date: **4/21/2014**

Total Estimated Construction Contract Cost = \$ **325,065,815**

	<u>CWWBS</u>	<u>Feature of Work</u>	<u>Contract Cost</u>	<u>% Contingency</u>	<u>\$ Contingency</u>	<u>Total</u>
	01 LANDS AND DAMAGES	Real Estate - Wetlands Mitigation	\$ 2,208,624	25.00%	\$ 552,156	\$ 2,760,780
1	12 02 HARBORS	Mobilization/demobilization - All Dredging	\$ 14,354,527	14.44%	\$ 2,073,067	\$ 16,427,594
2	12 02 HARBORS	Pipeline Dredging	\$ 29,958,299	14.44%	\$ 4,326,548	\$ 34,284,847
3	12 02 HARBORS	Clamshell Dredging	\$ 58,961,688	14.44%	\$ 8,515,189	\$ 67,476,877
4	12 02 HARBORS	Rock Dredging	\$ 147,426,498	30.86%	\$ 45,499,267	\$ 192,925,765
5	12 02 HARBORS	Hopper Dredging	\$ 52,961,658	14.44%	\$ 7,648,670	\$ 60,610,328
6	11 01 LEVEES	Disposal Area Improvements	\$ 11,881,145	13.10%	\$ 1,556,644	\$ 13,437,789
7	12 02 HARBORS	Aids to Navigation	\$ 522,000	7.00%	\$ 36,540	\$ 558,540.00
8		Environmental Monitoring	\$ 9,000,000	10.90%	\$ 980,825	\$ 9,980,825.39
9			\$ -	0.00%	\$ -	\$ -
10			\$ -	0.00%	\$ -	\$ -
11			\$ -	0.00%	\$ -	\$ -
12	All Other	Remaining Construction Items	\$ -	0.0%	\$ -	\$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	\$ 4,720,000	7.00%	\$ 330,400	\$ 5,050,400
14	31 CONSTRUCTION MANAGEMENT	Construction Management	\$ 4,875,987	14.79%	\$ 721,151	\$ 5,597,138
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)				\$ -	

Totals								
	Real Estate	\$	2,208,624	25.00%	\$	552,156	\$	2,760,780
	Total Construction Estimate	\$	325,065,815	21.73%	\$	70,636,749	\$	395,702,564
	Total Planning, Engineering & Design	\$	4,720,000	7.00%	\$	330,400	\$	5,050,400
	Total Construction Management	\$	4,875,987	14.79%	\$	721,151	\$	5,597,138
	Total	\$	336,870,426	21%	\$	72,240,456	\$	409,110,883
					Base	Mid-Pt	80%	
	Range Estimate (\$000's)				\$336,870k	\$373,000k		\$409,111k

Fixed Dollar Risk Add: (Allows for additional risk to be added to the risk analysis. Must include justification. Does not allocate to Real Estate.)

D6. TOTAL PROJECT COST SUMMARY

The Total Project Cost Summary (TPCS) addresses inflation through project completion (accomplished by escalation to mid-point of construction per ER 1110-2-1302, Appendix C, Page C-2). It is based on the scope of the Recommended Plan and the official project schedule. The TPCS includes Federal and Non-Federal costs for Lands and Damages, all construction features, PED, S&A and all other Non-construction features along with the appropriate contingencies and escalation associated with each of these activities. The TPCS is formatted according to the WBS and uses Civil Works Construction Cost Indexing System factors for escalation (EM 1110-2-1304) of construction costs and Office of Management and Budget (EC 11-2-18X, 20 Feb 2008) factors for escalation of PED and S&A costs. The Total Project Cost Summary was prepared using the MCACES/MII cost estimate on the NED Plan and for the LPP, as well as the contingency set by the risk analysis and the official project schedule. The TPCS for each plan is contained on the following pages.

**** TOTAL PROJECT COST SUMMARY ****

PROJECT: Charleston Harbor Deepening Feasibility - NED
PROJECT NO: 0
LOCATION: Charleston, SC

DISTRICT: SAC South Atlantic Division PREPARED: 8/25/2014
POC: CHIEF, DESIGN & GENERAL ENGINEERING, Nancy Jenkin

This Estimate reflects the scope and schedule in report; Charleston Harbor Post 45 Draft IFR and EIS

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Program Year (Budget EC): 2014 Effective Price Level Date: 1 OCT 13		ESC (%) M	COST (\$K) N	CNTG (\$K) O	FULL (\$K) O
										Spent Thru: 10/1/2013 (\$K)	TOTAL FIRST COST (\$K)				
12	NAVIGATION PORTS & HARBORS	\$242,911	\$51,011	21%	\$293,922	0.0%	\$242,911	\$51,011	\$293,922	\$0	\$293,922	10.6%	\$268,666	\$56,420	\$325,085
11	LEVEES & FLOODWALLS	\$11,881	\$2,495	21%	\$14,376	0.0%	\$11,881	\$2,495	\$14,376	\$0	\$14,376	8.7%	\$12,912	\$2,712	\$15,624
06	FISH & WILDLIFE FACILITIES	\$9,000	\$1,890	21%	\$10,890	0.0%	\$9,000	\$1,890	\$10,890	\$0	\$10,890	21.8%	\$10,960	\$2,302	\$13,262
06	FISH & WILDLIFE FACILITIES	\$60,752	\$12,758	21%	\$73,510	0.0%	\$60,752	\$12,758	\$73,510	\$0	\$73,510	10.3%	\$67,010	\$14,072	\$81,082
02	RELOCATIONS	\$522	\$110	21%	\$632	0.0%	\$522	\$110	\$632	\$0	\$632	11.9%	\$584	\$123	\$707
CONSTRUCTION ESTIMATE TOTALS:		\$325,066	\$68,264		\$393,330	0.0%	\$325,066	\$68,264	\$393,330	\$0	\$393,330	10.8%	\$360,132	\$75,628	\$435,760
01	LANDS AND DAMAGES	\$2,209	\$552	25%	\$2,761	0.0%	\$2,209	\$552	\$2,761	\$0	\$2,761	6.5%	\$2,354	\$588	\$2,942
30	PLANNING, ENGINEERING & DESIGN	\$4,720	\$991	21%	\$5,711	0.0%	\$4,720	\$991	\$5,711	\$0	\$5,711	10.8%	\$5,229	\$1,098	\$6,327
31	CONSTRUCTION MANAGEMENT	\$4,877	\$1,024	21%	\$5,901	0.0%	\$4,877	\$1,024	\$5,901	\$0	\$5,901	20.2%	\$5,860	\$1,231	\$7,091
PROJECT COST TOTALS:		\$336,872	\$70,831	21%	\$407,703		\$336,872	\$70,831	\$407,703	\$0	\$407,703	10.9%	\$373,575	\$78,545	\$452,119

- Mandatory by Regulation** CHIEF, DESIGN & GENERAL ENGINEERING, Nancy Jenkins
- Mandatory by Regulation** PROJECT MANAGER, Brian Williams
- Mandatory by Regulation** CHIEF, REAL ESTATE, Belinda Estabrook, SAS
- CHIEF, PLANNING, Bret Walters
- CHIEF, ENGINEERING, Carole Works, PE
- CHIEF, OPERATIONS, Brian Wells, PE
- CHIEF, CONSTRUCTION, David Dodds, PE
- CHIEF, CONTRACTING, Lauri Newkirk-Paggi
- CHIEF, PM-PB, Brian Williams
- CHIEF, DPM, Lisa Metheny

ESTIMATED FEDERAL COST: 50% \$226,060
ESTIMATED NON-FEDERAL COST: 50% \$226,060
ADDITIONAL NON-FEDERAL COST: \$26,625
ESTIMATED TOTAL PROJECT COST: \$478,744

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Charleston Harbor Deepening Feasibility - NED
 LOCATION: Charleston, SC
 This Estimate reflects the scope and schedule in report; Charleston Harbor Post 45 Draft IFR and EIS

DISTRICT: SAC South Atlantic Division
 POC: CHIEF, DESIGN & GENERAL ENGINEERING, Nancy Jenkins
 PREPARED: 8/25/2014

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 3/15/2014		Effective Price Level: 10/1/2013		Program Year (Budget EC): 2014		Effective Price Level Date: 1 OCT 13						
WBS NUMBER	Civil Works Feature & Sub-Feature Description	RISK BASED				ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
		COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)									
A	B	C	D	E	F	G	H	I	J					
PHASE 1 Entrance Channel														
12	NAVIGATION PORTS & HARBORS	\$142,249	\$29,872	21%	\$172,121	0.0%	\$142,249	\$29,872	\$172,121	2019Q2	10.3%	\$156,901	\$32,949	\$189,850
11	LEVEES & FLOODWALLS	\$11,881	\$2,495	21%	\$14,376	0.0%	\$11,881	\$2,495	\$14,376	2018Q3	8.7%	\$12,912	\$2,712	\$15,624
06	FISH & WILDLIFE FACILITIES	\$9,000	\$1,890	21%	\$10,890	0.0%	\$9,000	\$1,890	\$10,890	2024Q2	21.8%	\$10,960	\$2,302	\$13,262
06	FISH & WILDLIFE FACILITIES	\$60,752	\$12,758	21%	\$73,510	0.0%	\$60,752	\$12,758	\$73,510	2019Q2	10.3%	\$67,010	\$14,072	\$81,082
02	RELOCATIONS	\$522	\$110	21%	\$632	0.0%	\$522	\$110	\$632	2020Q1	11.9%	\$584	\$123	\$707
		\$0												
CONSTRUCTION ESTIMATE TOTALS:		\$224,404	\$47,125	21%	\$271,529		\$224,404	\$47,125	\$271,529			\$248,367	\$52,157	\$300,524
01	LANDS AND DAMAGES	\$2,209	\$552	25%	\$2,761	0.0%	\$2,209	\$552	\$2,761	2017Q3	6.5%	\$2,354	\$588	\$2,942
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	\$449	\$94	21%	\$543	0.0%	\$449	\$94	\$543	2017Q2	10.8%	\$498	\$104	\$602
0.1%	Planning & Environmental Compliance	\$224	\$47	21%	\$271	0.0%	\$224	\$47	\$271	2017Q2	10.8%	\$248	\$52	\$300
0.2%	Engineering & Design	\$449	\$94	21%	\$543	0.0%	\$449	\$94	\$543	2017Q2	10.8%	\$498	\$104	\$602
0.2%	Reviews, ATRs, IEPRs, VE	\$449	\$94	21%	\$543	0.0%	\$449	\$94	\$543	2017Q2	10.8%	\$498	\$104	\$602
0.2%	Life Cycle Updates (cost, schedule, risks)	\$449	\$94	21%	\$543	0.0%	\$449	\$94	\$543	2017Q2	10.8%	\$498	\$104	\$602
0.2%	Contracting & Reprographics	\$449	\$94	21%	\$543	0.0%	\$449	\$94	\$543	2017Q2	10.8%	\$498	\$104	\$602
0.2%	Engineering During Construction	\$449	\$94	21%	\$543	0.0%	\$449	\$94	\$543	2019Q2	19.7%	\$537	\$113	\$650
0.1%	Planning During Construction	\$224	\$47	21%	\$271	0.0%	\$224	\$47	\$271	2019Q2	19.7%	\$268	\$56	\$324
0.1%	Project Operations	\$224	\$47	21%	\$271	0.0%	\$224	\$47	\$271	2017Q2	10.8%	\$248	\$52	\$300
31	CONSTRUCTION MANAGEMENT													
1.0%	Construction Management	\$2,244	\$471	21%	\$2,715	0.0%	\$2,244	\$471	\$2,715	2019Q2	19.7%	\$2,685	\$564	\$3,249
0.3%	Project Operation:	\$673	\$141	21%	\$814	0.0%	\$673	\$141	\$814	2019Q2	19.7%	\$805	\$169	\$975
0.2%	Project Management	\$449	\$94	21%	\$543	0.0%	\$449	\$94	\$543	2019Q2	19.7%	\$537	\$113	\$650
CONTRACT COST TOTALS:		\$233,345	\$49,091		\$282,436		\$233,345	\$49,091	\$282,436			\$258,538	\$54,387	\$312,925

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Charleston Harbor Deepening Feasibility - NED
 LOCATION: Charleston, SC
 This Estimate reflects the scope and schedule in report; Charleston Harbor Post 45 Draft IFR and EIS

DISTRICT: SAC South Atlantic Division
 POC: CHIEF, DESIGN & GENERAL ENGINEERING, Nancy Jenkins
 PREPARED: 8/25/2014

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 3/15/2014		Program Year (Budget EC): 2014		Effective Price Level: 10/1/2013		Effective Price Level Date: 1 OCT 13						
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
PHASE 2 Lower Harbor														
12	NAVIGATION PORTS & HARBORS	\$68,403	\$14,365	21%	\$82,768	0.0%	\$68,403	\$14,365	\$82,768	2019Q3	10.9%	\$75,826	\$15,924	\$91,750
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$68,403	\$14,365	21%	\$82,768		\$68,403	\$14,365	\$82,768			\$75,826	\$15,924	\$91,750
01	LANDS AND DAMAGES	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	\$137	\$29	21%	\$166	0.0%	\$137	\$29	\$166	2018Q1	14.1%	\$156	\$33	\$189
0.1%	Planning & Environmental Compliance	\$68	\$14	21%	\$82	0.0%	\$68	\$14	\$82	2018Q1	14.1%	\$78	\$16	\$94
0.2%	Engineering & Design	\$137	\$29	21%	\$166	0.0%	\$137	\$29	\$166	2018Q1	14.1%	\$156	\$33	\$189
0.2%	Reviews, ATRs, IEPRs, VE	\$137	\$29	21%	\$166	0.0%	\$137	\$29	\$166	2018Q1	14.1%	\$156	\$33	\$189
0.2%	Life Cycle Updates (cost, schedule, risks)	\$137	\$29	21%	\$166	0.0%	\$137	\$29	\$166	2018Q1	14.1%	\$156	\$33	\$189
0.2%	Contracting & Reprographics	\$137	\$29	21%	\$166	0.0%	\$137	\$29	\$166	2018Q1	14.1%	\$156	\$33	\$189
0.2%	Engineering During Construction	\$137	\$29	21%	\$166	0.0%	\$137	\$29	\$166	2019Q3	20.9%	\$166	\$35	\$200
0.1%	Planning During Construction	\$68	\$14	21%	\$82	0.0%	\$68	\$14	\$82	2019Q3	20.9%	\$82	\$17	\$99
0.1%	Project Operations	\$68	\$14	21%	\$82	0.0%	\$68	\$14	\$82	2018Q1	14.1%	\$78	\$16	\$94
31	CONSTRUCTION MANAGEMENT													
1.0%	Construction Management	\$684	\$144	21%	\$828	0.0%	\$684	\$144	\$828	2019Q3	20.9%	\$827	\$174	\$1,000
0.3%	Project Operation:	\$205	\$43	21%	\$248	0.0%	\$205	\$43	\$248	2019Q3	20.9%	\$248	\$52	\$300
0.2%	Project Management	\$137	\$29	21%	\$166	0.0%	\$137	\$29	\$166	2019Q3	20.9%	\$166	\$35	\$200
CONTRACT COST TOTALS:		\$70,455	\$14,796		\$85,251		\$70,455	\$14,796	\$85,251			\$78,251	\$16,433	\$94,683

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Charleston Harbor Deepening Feasibility - NED
 LOCATION: Charleston, SC
 This Estimate reflects the scope and schedule in report; Charleston Harbor Post 45 Draft IFR and EIS

DISTRICT: SAC South Atlantic Division
 POC: CHIEF, DESIGN & GENERAL ENGINEERING, Nancy Jenkins
 PREPARED: 8/25/2014

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 3/15/2014		Program Year (Budget EC): 2014		Effective Price Level Date: 1 OCT 13								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
PHASE 3 Upper Harbor														
12	NAVIGATION PORTS & HARBORS	\$32,259	\$6,774	21%	\$39,033	0.0%	\$32,259	\$6,774	\$39,033	2019Q4	11.4%	\$35,938	\$7,547	\$43,486
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$32,259	\$6,774	21%	\$39,033		\$32,259	\$6,774	\$39,033			\$35,938	\$7,547	\$43,486
01	LANDS AND DAMAGES	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	\$65	\$14	21%	\$79	0.0%	\$65	\$14	\$79	2019Q1	18.5%	\$77	\$16	\$93
0.1%	Planning & Environmental Compliance	\$32	\$7	21%	\$39	0.0%	\$32	\$7	\$39	2019Q1	18.5%	\$38	\$8	\$46
0.2%	Engineering & Design	\$65	\$14	21%	\$79	0.0%	\$65	\$14	\$79	2019Q1	18.5%	\$77	\$16	\$93
0.2%	Reviews, ATRs, IEPRs, VE	\$65	\$14	21%	\$79	0.0%	\$65	\$14	\$79	2019Q1	18.5%	\$77	\$16	\$93
0.2%	Life Cycle Updates (cost, schedule, risks)	\$65	\$14	21%	\$79	0.0%	\$65	\$14	\$79	2019Q1	18.5%	\$77	\$16	\$93
0.2%	Contracting & Reprographics	\$65	\$14	21%	\$79	0.0%	\$65	\$14	\$79	2019Q1	18.5%	\$77	\$16	\$93
0.2%	Engineering During Construction	\$65	\$14	21%	\$79	0.0%	\$65	\$14	\$79	2019Q4	22.0%	\$79	\$17	\$96
0.1%	Planning During Construction	\$32	\$7	21%	\$39	0.0%	\$32	\$7	\$39	2019Q4	22.0%	\$39	\$8	\$47
0.1%	Project Operations	\$32	\$7	21%	\$39	0.0%	\$32	\$7	\$39	2019Q1	18.5%	\$38	\$8	\$46
31	CONSTRUCTION MANAGEMENT													
1.0%	Construction Management	\$323	\$68	21%	\$391	0.0%	\$323	\$68	\$391	2019Q4	22.0%	\$394	\$83	\$477
0.3%	Project Operation:	\$97	\$20	21%	\$117	0.0%	\$97	\$20	\$117	2019Q4	22.0%	\$118	\$25	\$143
0.2%	Project Management	\$65	\$14	21%	\$79	0.0%	\$65	\$14	\$79	2019Q4	22.0%	\$79	\$17	\$96
CONTRACT COST TOTALS:		\$33,230	\$6,978		\$40,208		\$33,230	\$6,978	\$40,208			\$37,110	\$7,793	\$44,903

**** TOTAL PROJECT COST SUMMARY ****

PROJECT: Charleston Harbor Deepening Feasibility - LPP
PROJECT NO: 0
LOCATION: Charleston, SC

DISTRICT: SAC South Atlantic Division PREPARED: 8/25/2014
POC: CHIEF, DESIGN & GENERAL ENGINE

This Estimate reflects the scope and schedule in report; Charleston Harbor Post 45 Draft IFR and EIS

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Program Year (Budget EC): 2014 Effective Price Level Date: 1 OCT 13		ESC (%) M	COST (\$K) N	CNTG (\$K) O	FULL (\$K) O
										Spent Thru: 10/1/2013 (\$K)	TOTAL FIRST COST (\$K)				
12	NAVIGATION PORTS & HARBORS	\$302,733	\$63,574	21%	\$366,307	0.0%	\$302,733	\$63,574	\$366,307	\$0	\$366,307	10.6%	\$334,747	\$70,297	\$405,044
11	LEVEES & FLOODWALLS	\$11,881	\$2,495	21%	\$14,376	0.0%	\$11,881	\$2,495	\$14,376	\$0	\$14,376	8.7%	\$12,912	\$2,712	\$15,624
06	FISH & WILDLIFE FACILITIES	\$9,000	\$1,890	21%	\$10,890	0.0%	\$9,000	\$1,890	\$10,890	\$0	\$10,890	21.8%	\$10,960	\$2,302	\$13,262
06	FISH & WILDLIFE FACILITIES	\$60,752	\$12,758	21%	\$73,510	0.0%	\$60,752	\$12,758	\$73,510	\$0	\$73,510	10.3%	\$67,010	\$14,072	\$81,082
02	RELOCATIONS	\$522	\$110	21%	\$632	0.0%	\$522	\$110	\$632	\$0	\$632	11.9%	\$584	\$123	\$707
CONSTRUCTION ESTIMATE TOTALS:		\$384,888	\$80,826		\$465,714	0.0%	\$384,888	\$80,826	\$465,714	\$0	\$465,714	10.7%	\$426,213	\$89,505	\$515,718
01	LANDS AND DAMAGES	\$3,052	\$763	25%	\$3,815	0.0%	\$3,052	\$763	\$3,815	\$0	\$3,815	6.5%	\$3,252	\$813	\$4,065
30	PLANNING, ENGINEERING & DESIGN	\$4,720	\$991	21%	\$5,711	0.0%	\$4,720	\$991	\$5,711	\$0	\$5,711	10.8%	\$5,229	\$1,098	\$6,327
31	CONSTRUCTION MANAGEMENT	\$5,774	\$1,213	21%	\$6,987	0.0%	\$5,774	\$1,213	\$6,987	\$0	\$6,987	20.1%	\$6,936	\$1,457	\$8,393
PROJECT COST TOTALS:		\$398,434	\$83,793	21%	\$482,227		\$398,434	\$83,793	\$482,227	\$0	\$482,227	10.8%	\$441,631	\$92,872	\$534,503

- Mandatory by Regulation** CHIEF, DESIGN & GENERAL ENGINEERING, Nancy Jenkins
- Mandatory by Regulation** PROJECT MANAGER, Brian Williams
- Mandatory by Regulation** CHIEF, REAL ESTATE, Belinda Estabrook, SAS
- CHIEF, PLANNING, Bret Walters
- CHIEF, ENGINEERING, Carole Works, PE
- CHIEF, OPERATIONS, Brian Wells, PE
- CHIEF, CONSTRUCTION, David Dodds, PE
- CHIEF, CONTRACTING, Lauri Newkirk-Paggi
- CHIEF, PM-PB, Brian Williams
- CHIEF, DPM, Lisa Metheny

ESTIMATED FEDERAL COST: NED Cost \$226,060
ESTIMATED NON-FEDERAL COST: Delta \$308,444
ADDITIONAL NON-FEDERAL COST: \$27,026
ESTIMATED TOTAL PROJECT COST: \$561,529

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Charleston Harbor Deepening Feasibility - LPP
 LOCATION: Charleston, SC
 This Estimate reflects the scope and schedule in report; Charleston Harbor Post 45 Draft IFR and EIS

DISTRICT: SAC South Atlantic Division
 POC: CHIEF, DESIGN & GENERAL ENGINEERING, Nancy Jenkins
 PREPARED: 8/25/2014

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 3/15/2014		Effective Price Level: 10/1/2013		Program Year (Budget EC): 2014		Effective Price Level Date: 1 OCT 13						
WBS NUMBER	Civil Works Feature & Sub-Feature Description	RISK BASED				ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
		COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)									
A	B	C	D	E	F	G	H	I	J					
PHASE 1 Entrance Channel														
12	NAVIGATION PORTS & HARBORS	\$186,120	\$39,085	21%	\$225,205	0.0%	\$186,120	\$39,085	\$225,205	2019Q2	10.3%	\$205,290	\$43,111	\$248,401
11	LEVEES & FLOODWALLS	\$11,881	\$2,495	21%	\$14,376	0.0%	\$11,881	\$2,495	\$14,376	2018Q3	8.7%	\$12,912	\$2,712	\$15,624
06	FISH & WILDLIFE FACILITIES	\$9,000	\$1,890	21%	\$10,890	0.0%	\$9,000	\$1,890	\$10,890	2024Q2	21.8%	\$10,960	\$2,302	\$13,262
06	FISH & WILDLIFE FACILITIES	\$60,752	\$12,758	21%	\$73,510	0.0%	\$60,752	\$12,758	\$73,510	2019Q2	10.3%	\$67,010	\$14,072	\$81,082
02	RELOCATIONS	\$522	\$110	21%	\$632	0.0%	\$522	\$110	\$632	2020Q1	11.9%	\$584	\$123	\$707
		\$0												
CONSTRUCTION ESTIMATE TOTALS:		\$268,275	\$56,338	21%	\$324,613		\$268,275	\$56,338	\$324,613			\$296,757	\$62,319	\$359,076
01	LANDS AND DAMAGES	\$3,052	\$763	25%	\$3,815	0.0%	\$3,052	\$763	\$3,815	2017Q3	6.5%	\$3,252	\$813	\$4,065
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	\$537	\$113	21%	\$650	0.0%	\$537	\$113	\$650	2017Q2	10.8%	\$595	\$125	\$720
0.1%	Planning & Environmental Compliance	\$268	\$56	21%	\$324	0.0%	\$268	\$56	\$324	2017Q2	10.8%	\$297	\$62	\$359
0.2%	Engineering & Design	\$537	\$113	21%	\$650	0.0%	\$537	\$113	\$650	2017Q2	10.8%	\$595	\$125	\$720
0.2%	Reviews, ATRs, IEPRs, VE	\$537	\$113	21%	\$650	0.0%	\$537	\$113	\$650	2017Q2	10.8%	\$595	\$125	\$720
0.2%	Life Cycle Updates (cost, schedule, risks)	\$537	\$113	21%	\$650	0.0%	\$537	\$113	\$650	2017Q2	10.8%	\$595	\$125	\$720
0.2%	Contracting & Reprographics	\$537	\$113	21%	\$650	0.0%	\$537	\$113	\$650	2017Q2	10.8%	\$595	\$125	\$720
0.2%	Engineering During Construction	\$537	\$113	21%	\$650	0.0%	\$537	\$113	\$650	2019Q2	19.7%	\$643	\$135	\$778
0.1%	Planning During Construction	\$268	\$56	21%	\$324	0.0%	\$268	\$56	\$324	2019Q2	19.7%	\$321	\$67	\$388
0.1%	Project Operations	\$268	\$56	21%	\$324	0.0%	\$268	\$56	\$324	2017Q2	10.8%	\$297	\$62	\$359
31	CONSTRUCTION MANAGEMENT													
1.0%	Construction Management	\$2,683	\$563	21%	\$3,246	0.0%	\$2,683	\$563	\$3,246	2019Q2	19.7%	\$3,211	\$674	\$3,885
0.3%	Project Operation:	\$805	\$169	21%	\$974	0.0%	\$805	\$169	\$974	2019Q2	19.7%	\$963	\$202	\$1,166
0.2%	Project Management	\$537	\$113	21%	\$650	0.0%	\$537	\$113	\$650	2019Q2	19.7%	\$643	\$135	\$778
CONTRACT COST TOTALS:		\$279,378	\$58,791		\$338,169		\$279,378	\$58,791	\$338,169			\$309,358	\$65,095	\$374,453

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Charleston Harbor Deepening Feasibility - LPP
 LOCATION: Charleston, SC
 This Estimate reflects the scope and schedule in report; Charleston Harbor Post 45 Draft IFR and EIS

DISTRICT: SAC South Atlantic Division
 POC: CHIEF, DESIGN & GENERAL ENGINEERING, Nancy Jenkins
 PREPARED: 8/25/2014

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 3/15/2014		Program Year (Budget EC): 2014		Effective Price Level: 10/1/2013		Effective Price Level Date: 1 OCT 13						
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
PHASE 2 Lower Harbor														
12	NAVIGATION PORTS & HARBORS	\$82,606	\$17,347	21%	\$99,953	0.0%	\$82,606	\$17,347	\$99,953	2019Q3	10.9%	\$91,571	\$19,230	\$110,801
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
							\$0							
	CONSTRUCTION ESTIMATE TOTALS:	\$82,606	\$17,347	21%	\$99,953		\$82,606	\$17,347	\$99,953			\$91,571	\$19,230	\$110,801
01	LANDS AND DAMAGES	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	\$165	\$35	21%	\$200	0.0%	\$165	\$35	\$200	2018Q1	14.1%	\$188	\$40	\$228
0.1%	Planning & Environmental Compliance	\$83	\$17	21%	\$100	0.0%	\$83	\$17	\$100	2018Q1	14.1%	\$95	\$20	\$115
0.2%	Engineering & Design	\$165	\$35	21%	\$200	0.0%	\$165	\$35	\$200	2018Q1	14.1%	\$188	\$40	\$228
0.2%	Reviews, ATRs, IEPRs, VE	\$165	\$35	21%	\$200	0.0%	\$165	\$35	\$200	2018Q1	14.1%	\$188	\$40	\$228
0.2%	Life Cycle Updates (cost, schedule, risks)	\$165	\$35	21%	\$200	0.0%	\$165	\$35	\$200	2018Q1	14.1%	\$188	\$40	\$228
0.2%	Contracting & Reprographics	\$165	\$35	21%	\$200	0.0%	\$165	\$35	\$200	2018Q1	14.1%	\$188	\$40	\$228
0.2%	Engineering During Construction	\$165	\$35	21%	\$200	0.0%	\$165	\$35	\$200	2019Q3	20.9%	\$199	\$42	\$241
0.1%	Planning During Construction	\$83	\$17	21%	\$100	0.0%	\$83	\$17	\$100	2019Q3	20.9%	\$100	\$21	\$121
0.1%	Project Operations	\$83	\$17	21%	\$100	0.0%	\$83	\$17	\$100	2018Q1	14.1%	\$95	\$20	\$115
31	CONSTRUCTION MANAGEMENT													
1.0%	Construction Management	\$826	\$173	21%	\$999	0.0%	\$826	\$173	\$999	2019Q3	20.9%	\$998	\$210	\$1,208
0.3%	Project Operation:	\$248	\$52	21%	\$300	0.0%	\$248	\$52	\$300	2019Q3	20.9%	\$300	\$63	\$363
0.2%	Project Management	\$165	\$35	21%	\$200	0.0%	\$165	\$35	\$200	2019Q3	20.9%	\$199	\$42	\$241
CONTRACT COST TOTALS:		\$85,084	\$17,868		\$102,952		\$85,084	\$17,868	\$102,952			\$94,498	\$19,845	\$114,343

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Charleston Harbor Deepening Feasibility - LPP
 LOCATION: Charleston, SC
 This Estimate reflects the scope and schedule in report; Charleston Harbor Post 45 Draft IFR and EIS

DISTRICT: SAC South Atlantic Division
 POC: CHIEF, DESIGN & GENERAL ENGINEERING, Nancy Jenkins
 PREPARED: 8/25/2014

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 3/15/2014		Program Year (Budget EC): 2014		Effective Price Level Date: 1 OCT 13								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
PHASE 3 Upper Harbor														
12	NAVIGATION PORTS & HARBORS	\$34,007	\$7,141	21%	\$41,148	0.0%	\$34,007	\$7,141	\$41,148	2019Q4	11.4%	\$37,886	\$7,956	\$45,842
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$34,007	\$7,141	21%	\$41,148		\$34,007	\$7,141	\$41,148			\$37,886	\$7,956	\$45,842
01	LANDS AND DAMAGES	\$0	\$0	0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	\$68	\$14	21%	\$82	0.0%	\$68	\$14	\$82	2019Q1	18.5%	\$81	\$17	\$98
0.1%	Planning & Environmental Compliance	\$34	\$7	21%	\$41	0.0%	\$34	\$7	\$41	2019Q1	18.5%	\$40	\$8	\$49
0.2%	Engineering & Design	\$68	\$14	21%	\$82	0.0%	\$68	\$14	\$82	2019Q1	18.5%	\$81	\$17	\$98
0.2%	Reviews, ATRs, IEPRs, VE	\$68	\$14	21%	\$82	0.0%	\$68	\$14	\$82	2019Q1	18.5%	\$81	\$17	\$98
0.2%	Life Cycle Updates (cost, schedule, risks)	\$68	\$14	21%	\$82	0.0%	\$68	\$14	\$82	2019Q1	18.5%	\$81	\$17	\$98
0.2%	Contracting & Reprographics	\$68	\$14	21%	\$82	0.0%	\$68	\$14	\$82	2019Q1	18.5%	\$81	\$17	\$98
0.2%	Engineering During Construction	\$68	\$14	21%	\$82	0.0%	\$68	\$14	\$82	2019Q4	22.0%	\$83	\$17	\$100
0.1%	Planning During Construction	\$34	\$7	21%	\$41	0.0%	\$34	\$7	\$41	2019Q4	22.0%	\$41	\$9	\$50
0.1%	Project Operations	\$34	\$7	21%	\$41	0.0%	\$34	\$7	\$41	2019Q1	18.5%	\$40	\$8	\$49
31	CONSTRUCTION MANAGEMENT													
1.0%	Construction Management	\$340	\$71	21%	\$411	0.0%	\$340	\$71	\$411	2019Q4	22.0%	\$415	\$87	\$502
0.3%	Project Operation:	\$102	\$21	21%	\$123	0.0%	\$102	\$21	\$123	2019Q4	22.0%	\$124	\$26	\$151
0.2%	Project Management	\$68	\$14	21%	\$82	0.0%	\$68	\$14	\$82	2019Q4	22.0%	\$83	\$17	\$100
CONTRACT COST TOTALS:		\$35,027	\$7,356		\$42,383		\$35,027	\$7,356	\$42,383			\$39,116	\$8,214	\$47,331

D7. COST MCX TPCS CERTIFICATION

The Cost MCX Total Project Cost Summary (TPCS) Certification will be obtained following the Draft Report review (DQC/ATR) and performance of the full CSRA.

ATTACHMENT D-1 - RISK REGISTERS FOR NED AND LPP

Charleston Harbor Deepening NED Plan - 50/48

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 21-Apr-14

Risk Level					
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3
	Negligible	Marginal	Moderate	Significant	Critical

Risk Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth						75%
PS-1	Mobilization/demobilization - All Dredging	Due to the study being based on a maximum design for depth, advanced maintenance, overdepth and requested channel widenings, scope growth is not a major concern for this project.	The PDT has considered all options for project depth from a 48' main channel up to 52'. In addition, all depths were studied with maximum widenings for the channel and terminal turning basins from input from the ports authority and harbor pilots. Therefore, any changes in project scope would be a decrease in scope and cost.	Negligible	Unlikely	0
PS-2	Pipeline Dredging	Due to the study being based on a maximum design for depth, advanced maintenance, overdepth and requested channel widenings, scope growth is not a major concern for this project.	The PDT has considered all options for project depth from a 48' main channel up to 52'. In addition, all depths were studied with maximum widenings for the channel and terminal turning basins from input from the ports authority and harbor pilots. Therefore, any changes in project scope would be a decrease in scope and cost.	Negligible	Unlikely	0
PS-3	Clamshell Dredging	Due to the study being based on a maximum design for depth, advanced maintenance, overdepth and requested channel widenings, scope growth is not a major concern for this project.	The PDT has considered all options for project depth from a 48' main channel up to 52'. In addition, all depths were studied with maximum widenings for the channel and terminal turning basins from input from the ports authority and harbor pilots. Therefore, any changes in project scope would be a decrease in scope and cost.	Negligible	Unlikely	0
PS-4	Rock Dredging	Due to the study being based on a maximum design for depth, advanced maintenance, overdepth and requested channel widenings, scope growth is not a major concern for this project.	The PDT has considered all options for project depth from a 48' main channel up to 52'. In addition, all depths were studied with maximum widenings for the channel and terminal turning basins from input from the ports authority and harbor pilots. Therefore, any changes in project scope would be a decrease in scope and cost.	Negligible	Unlikely	0
PS-5	Hopper Dredging	Due to the study being based on a maximum design for depth, advanced maintenance, overdepth and requested channel widenings, scope growth is not a major concern for this project.	The PDT has considered all options for project depth from a 48' main channel up to 52'. In addition, all depths were studied with maximum widenings for the channel and terminal turning basins from input from the ports authority and harbor pilots. Therefore, any changes in project scope would be a decrease in scope and cost.	Negligible	Unlikely	0
PS-6	Disposal Area Improvements	Due to this item being based on a maximum dike raising for all inland disposal sites, scope growth is not a major concern for this item.	The need for raising dike elevation for all disposal areas is still being evaluated and the number of disposal areas requiring height increases may go down. In addition, the need for a cross dike at Yellowhouse may be eliminated.	Negligible	Unlikely	0
PS-7	Aids to Navigation	Cost was provided by outside source, but included all changes that will be required.	Cost for this item provided by USCG and is based on moving the number of channel markers that would be impacted by this project. Scope growth for this item is not expected.	Marginal	Unlikely	0

PS-8	Environmental Monitoring	This item is estimated on the conservative side. Therefore, any changes expected would be a decrease in cost.	Cost for this item is based on a conservative duration of 9 years. If no significant impacts are noted after 5 years, monitoring may be discontinued.	Negligible	Unlikely	0	
PS-9		0		Negligible	Unlikely	0	
PS-10		0		Negligible	Unlikely	0	
PS-11		0		Negligible	Unlikely	0	
PS-12	Remaining Construction Items			Negligible	Unlikely	0	
PS-13	Planning, Engineering, & Design	PED activities are established and the scope is not expected to change.	PED for this project is planned for a set of activities that would not be significantly impacted by changes in project scope.	Negligible	Unlikely	0	
PS-14	Construction Management	Construction management is based on duration and amount of construction work required.	Due to construction scope being based on maximum conditions, this item is not expected to increase.	Negligible	Unlikely	0	
Acquisition Strategy						Maximum Project Growth	30%
AS-1	Mobilization/demobilization - All Dredging	Acquisition strategy should not impact the normal dredging operations.	Acquisition Strategy is expected to be full and open large business solicitation. No impact expected from AS.	Negligible	Unlikely	0	
AS-2	Pipeline Dredging	Acquisition strategy should not impact the normal dredging operations.	Acquisition Strategy is expected to be full and open large business solicitation. No impact expected from AS.	Negligible	Unlikely	0	
AS-3	Clamshell Dredging	Acquisition strategy should not impact the normal dredging operations.	Acquisition Strategy is expected to be full and open large business solicitation. No impact expected from AS.	Negligible	Unlikely	0	
AS-4	Rock Dredging	Dredge availability may be limited due to limited number of dredges capable of this work.	Acquisition Strategy is expected to be full and open large business solicitation. However, availability of this type of dredge may impact the cost.	Moderate	Possible	2	
AS-5	Hopper Dredging	Acquisition strategy should not impact the normal dredging operations.	Acquisition Strategy is expected to be full and open large business solicitation. No impact expected from AS.	Negligible	Unlikely	0	
AS-6	Disposal Area Improvements	Disposal Area improvements may be small business/8A solicitation.	SAC has received fair and reasonable bids for this type of simple earthwork contracts from small business/8A contractors.	Moderate	Unlikely	1	
AS-7	Aids to Navigation	Cost provided by USCG.	This acquisition would be by inter-agency transfer and therefore would have no associated risk.	Negligible	Unlikely	0	
AS-8	Environmental Monitoring	Monitoring would be accomplished by a variety of state and federal agencies through existing cooperative agreements, in house labor or contracts with environmental contractors.	Due to the variety of methods expected to accomplish this work, there is some inherent risk involved in this item.	Moderate	Possible	2	
AS-9		0		Negligible	Unlikely	0	

AS-10	0			Negligible	Unlikely	0
AS-11	0			Negligible	Unlikely	0
AS-12	Remaining Construction Items			Negligible	Unlikely	0
AS-13	Planning, Engineering, & Design	PED is accomplished in-house and AS will not have any impact.	Acquisition strategy would have no affect on PED.	Negligible	Unlikely	0
AS-14	Construction Management	If AS affects the construction schedule this will have some impact on construction management.	Acquisition strategy could have some impact on construction management especially as it relates to schedule.	Marginal	Possible	1

Construction Elements				Maximum Project Growth		25%
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CE-1	Mobilization/demobilization - All Dredging	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-2	Pipeline Dredging	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-3	Clamshell Dredging	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-4	Rock Dredging	This item requires a specialized dredge to accomplish the work.	Rock dredging is the only portion of work that requires special equipment to perform the required work.	Moderate	Likely	3
CE-5	Hopper Dredging	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-6	Disposal Area Improvements	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-7	Aids to Navigation	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-8	Environmental Monitoring	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-9	0			Negligible	Unlikely	0
CE-10	0			Negligible	Unlikely	0
CE-11	0			Negligible	Unlikely	0

CE-12	Remaining Construction Items			Negligible	Unlikely	0
CE-13	Planning, Engineering, & Design	No specialized equipment required for this element. No affect on PED.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-14	Construction Management	Due to management of rock dredging, some impact may be experienced for this item.	Standard construction methods required for most of this project with a normal schedule. However, due to management of rock dredging some minor impact may be experienced.	Marginal	Possible	1
Quantities for Current Scope					Maximum Project Growth	20%
Q-1	Mobilization/demobilization - All Dredging	Additional mobilizations may be required due to environmental windows for hopper dredging activities.	The cost estimate is based on mob/demob of two 24" pipeline dredges for the reaches with inland disposal, two 26 CY clamshell dredges for the inner harbor reaches for offshore disposal, one 30" rock cutter dredge for expected rock in the entrance channel, one clamshell dredge with 14 CY rock bucket for hard bottom mitigation and one large and two medium hoppers for four months to complete required hopper	Moderate	Possible	2
Q-2	Pipeline Dredging	Quantities are based on difference between current authorized channel depth and depth for alternative and are based on surveys taken in 2013.	Quantities are not expected to increase significantly and may decrease as this estimate is based on maximum widenings which may be reduced after ship simulation in PED.	Moderate	Possible	2
Q-3	Clamshell Dredging	Quantities are based on difference between current authorized channel depth and depth for alternative and are based on surveys taken in 2013.	Quantities are not expected to increase significantly and may decrease as this estimate is based on maximum widenings which may be reduced after ship simulation in PED.	Moderate	Possible	2
Q-4	Rock Dredging	Quantities are based on difference between current authorized channel depth and depth for alternative and are based on core samples taken within the last year.	Quantities for rock dredging are conservative and are not expected to increase. Quantities were calculated for all areas at 1' below the bottom surface of the channel.	Moderate	Possible	2
Q-5	Hopper Dredging	Quantities are based on difference between current authorized channel depth and depth for alternative and are based on surveys taken in 2013.	Quantities are not expected to increase significantly and may decrease as this estimate is based on maximum widenings which may be reduced after ship simulation	Moderate	Possible	2
Q-6	Disposal Area Improvements	The quantities used to calculate cost for this item assumed a 5' dike elevation increase for all disposal areas and the creation of a cross dike in the Yellowhouse DA.	The need for raising dike elvation for all disposal areas is still being evaluated and the number of disposal areas requiring height increases may go down. In addition, the need for a cross dike at Yellowhouse may be eliminated.	Marginal	Unlikely	0
Q-7	Aids to Navigation	This cost was generated by the US Coast Guard and encompasses changes in navigation buoys and markers required with the expanded channel.	Cost was provided by outside source, but included all changes that will be required.	Marginal	Unlikely	0
Q-8	Environmental Monitoring	This cost is for environmental monitoring for a period of 9 years and is conservative.	This item is estimated on the conservative side. Therefore, any changes expected would be a decrease in cost.	Negligible	Unlikely	0
Q-9		0		Negligible	Unlikely	0
Q-10		0		Negligible	Unlikely	0
Q-11		0		Negligible	Unlikely	0
Q-12	Remaining Construction Items			Negligible	Unlikely	0

Q-13	Planning, Engineering, & Design	Quantity of dredged material could change.	PED for this project is planned for a set of activities that would not be significantly impacted by changes in project scope.	Negligible	Unlikely	0
Q-14	Construction Management	Quantity of dredged material could change.	Construction S&A would be affected by changes in material to be dredged and would need to increase accordingly.	Marginal	Possible	1

Specialty Fabrication or Equipment	Maximum Project Growth	75%
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FE-1	Mobilization/demobilization - All Dredging	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-2	Pipeline Dredging	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-3	Clamshell Dredging	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-4	Rock Dredging	Specialty dredge required for this part of the project.	Due to limited availability of rock cutter dredges, this item has risk.	Moderate	Possible	2
FE-5	Hopper Dredging	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-6	Disposal Area Improvements	No specialized equipment required for this element.	Standard earth moving equipment and methods required for this operation.	Negligible	Unlikely	0
FE-7	Aids to Navigation	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-8	Environmental Monitoring	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-9		0		Negligible	Unlikely	0
FE-10		0		Negligible	Unlikely	0
FE-11		0		Negligible	Unlikely	0
FE-12	Remaining Construction Items			Negligible	Unlikely	0
FE-13	Planning, Engineering, & Design	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-14	Construction Management	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0

Cost Estimate Assumptions	Maximum Project Growth	35%
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CT-1	Mobilization/demobilization - All Dredging	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-2	Pipeline Dredging	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-3	Clamshell Dredging	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-4	Rock Dredging	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-5	Hopper Dredging	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-6	Disposal Area Improvements	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-7	Aids to Navigation	Quote provided by USCG.	Cost was provided by outside source, but included all changes that will be required.	Negligible	Unlikely	0	
CT-8	Environmental Monitoring	Conservative time period used in estimate.	Cost estimate based on 9 years of monitoring. May be reduced after after 5 years if no significant impacts are noted and mitigation efforts are effective.	Negligible	Unlikely	0	
CT-9		0		Negligible	Unlikely	0	
CT-10		0		Negligible	Unlikely	0	
CT-11		0		Negligible	Unlikely	0	
CT-12	Remaining Construction Items			Negligible	Unlikely	0	
CT-13	Planning, Engineering, & Design	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Negligible	Unlikely	0	
CT-14	Construction Management	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Negligible	Unlikely	0	
External Project Risks						Maximum Project Growth	40%
EX-1	Mobilization/demobilization - All Dredging	Unexpected rises in fuel cost could impact this element.	Fuel cost have an impact on this item. However, escalation is accounted for in the TPCS. Only increases outside of the expected range would have additional impact.	Marginal	Possible	1	
EX-2	Pipeline Dredging	Unexpected rises in fuel cost could impact this element.	Fuel cost have an impact on this item. However, escalation is accounted for in the TPCS. Only increases outside of the expected range would have additional impact.	Marginal	Possible	1	

EX-3	Clamshell Dredging	Unexpected rises in fuel cost could impact this element.	Fuel cost have an impact on this item. However, escalation is accounted for in the TPCS. Only increases outside of the expected range would have additional impact.	Marginal	Possible	1
EX-4	Rock Dredging	Unexpected rises in fuel cost could impact this element.	Fuel cost have an impact on this item. However, escalation is accounted for in the TPCS. Only increases outside of the expected range would have additional impact.	Marginal	Possible	1
EX-5	Hopper Dredging	Unexpected rises in fuel cost could impact this element.	Fuel cost have an impact on this item. However, escalation is accounted for in the TPCS. Only increases outside of the expected range would have additional impact.	Marginal	Possible	1
EX-6	Disposal Area Improvements	Adverse weather may impact the schedule for preparation of the disposal areas.	Due to the relatively long duration of work on the various sites, weather such as Tropical Storms or Hurricanes can have an impact.	Marginal	Possible	1
EX-7	Aids to Navigation	External risks should not affect this item.	Short duration of effort should not be affected by weather and work performed by another DOD service reduce the risk of this item.	Negligible	Unlikely	0
EX-8	Environmental Monitoring	External risks should not affect this item.	Monitoring can be scheduled around any adverse weather conditions and should not be affected by any other external items.	Negligible	Unlikely	0
EX-9		0		Negligible	Unlikely	0
EX-10		0		Negligible	Unlikely	0
EX-11		0		Negligible	Unlikely	0
EX-12	Remaining Construction Items			Negligible	Unlikely	0
EX-13	Planning, Engineering, & Design	External risks should not affect this item.	External risks should not affect PED.	Negligible	Unlikely	0
EX-14	Construction Management	Adverse weather conditions could affect the project schedule and thus impact the cost of this element.	Adverse weather could extend the overall project schedule. This would cause additional labor time for construction management.	Marginal	Possible	1

Charleston Harbor Deepening LPP - 52/48

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 21-Apr-14

Risk Level					
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3
	Negligible	Marginal	Moderate	Significant	Critical

Risk Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth						75%
PS-1	Mobilization/demobilization - All Dredging	Due to the study being based on a maximum design for depth, advanced maintenance, overdepth and requested channel widenings, scope growth is not a major concern for this project.	The PDT has considered all options for project depth from a 48' main channel up to 52'. In addition, all depths were studied with maximum widenings for the channel and terminal turning basins from input from the ports authority and harbor pilots. Therefore, any changes in project scope would be a decrease in scope and cost.	Negligible	Unlikely	0
PS-2	Pipeline Dredging	Due to the study being based on a maximum design for depth, advanced maintenance, overdepth and requested channel widenings, scope growth is not a major concern for this project.	The PDT has considered all options for project depth from a 48' main channel up to 52'. In addition, all depths were studied with maximum widenings for the channel and terminal turning basins from input from the ports authority and harbor pilots. Therefore, any changes in project scope would be a decrease in scope and cost.	Negligible	Unlikely	0
PS-3	Clamshell Dredging	Due to the study being based on a maximum design for depth, advanced maintenance, overdepth and requested channel widenings, scope growth is not a major concern for this project.	The PDT has considered all options for project depth from a 48' main channel up to 52'. In addition, all depths were studied with maximum widenings for the channel and terminal turning basins from input from the ports authority and harbor pilots. Therefore, any changes in project scope would be a decrease in scope and cost.	Negligible	Unlikely	0
PS-4	Rock Dredging	Due to the study being based on a maximum design for depth, advanced maintenance, overdepth and requested channel widenings, scope growth is not a major concern for this project.	The PDT has considered all options for project depth from a 48' main channel up to 52'. In addition, all depths were studied with maximum widenings for the channel and terminal turning basins from input from the ports authority and harbor pilots. Therefore, any changes in project scope would be a decrease in scope and cost.	Negligible	Unlikely	0
PS-5	Hopper Dredging	Due to the study being based on a maximum design for depth, advanced maintenance, overdepth and requested channel widenings, scope growth is not a major concern for this project.	The PDT has considered all options for project depth from a 48' main channel up to 52'. In addition, all depths were studied with maximum widenings for the channel and terminal turning basins from input from the ports authority and harbor pilots. Therefore, any changes in project scope would be a decrease in scope and cost.	Negligible	Unlikely	0
PS-6	Disposal Area Improvements	Due to this item being based on a maximum dike raising for all inland disposal sites, scope growth is not a major concern for this item.	The need for raising dike elevation for all disposal areas is still being evaluated and the number of disposal areas requiring height increases may go down. In addition, the need for a cross dike at Yellowhouse may be eliminated.	Negligible	Unlikely	0
PS-7	Aids to Navigation	Cost was provided by outside source, but included all changes that will be required.	Cost for this item provided by USCG and is based on moving the number of channel markers that would be impacted by this project. Scope growth for this item is not expected.	Marginal	Unlikely	0

PS-8	Environmental Monitoring	This item is estimated on the conservative side. Therefore, any changes expected would be a decrease in cost.	Cost for this item is based on a conservative duration of 9 years. If no significant impacts are noted after 5 years, monitoring may be discontinued.	Negligible	Unlikely	0	
PS-9		0		Negligible	Unlikely	0	
PS-10		0		Negligible	Unlikely	0	
PS-11		0		Negligible	Unlikely	0	
PS-12	Remaining Construction Items			Negligible	Unlikely	0	
PS-13	Planning, Engineering, & Design	PED activities are established and the scope is not expected to change.	PED for this project is planned for a set of activities that would not be significantly impacted by changes in project scope.	Negligible	Possible	0	
PS-14	Construction Management	Construction management is based on duration and amount of construction work required.	Due to construction scope being based on maximum conditions, this item is not expected to increase.	Negligible	Unlikely	0	
Acquisition Strategy						Maximum Project Growth	30%
AS-1	Mobilization/demobilization - All Dredging	Acquisition strategy should not impact the normal dredging operations.	Acquisition Strategy is expected to be full and open large business solicitation. No impact expected from AS.	Negligible	Unlikely	0	
AS-2	Pipeline Dredging	Acquisition strategy should not impact the normal dredging operations.	Acquisition Strategy is expected to be full and open large business solicitation. No impact expected from AS.	Negligible	Unlikely	0	
AS-3	Clamshell Dredging	Acquisition strategy should not impact the normal dredging operations.	Acquisition Strategy is expected to be full and open large business solicitation. No impact expected from AS.	Negligible	Unlikely	0	
AS-4	Rock Dredging	Dredge availability may be limited due to limited number of dredges capable of this work.	Acquisition Strategy is expected to be full and open large business solicitation. However, availability of this type of dredge may impact the cost.	Moderate	Possible	2	
AS-5	Hopper Dredging	Acquisition strategy should not impact the normal dredging operations.	Acquisition Strategy is expected to be full and open large business solicitation. No impact expected from AS.	Negligible	Unlikely	0	
AS-6	Disposal Area Improvements	Disposal Area improvements may be small business/8A solicitation.	SAC has received fair and reasonable bids for this type of simple earthwork contracts from small business/8A contractors.	Moderate	Unlikely	1	
AS-7	Aids to Navigation	Cost provided by USCG.	This acquisition would be by inter-agency transfer and therefore would have no associated risk.	Negligible	Unlikely	0	
AS-8	Environmental Monitoring	Monitoring would be accomplished by a variety of state and federal agencies through existing cooperative agreements, in house labor or contracts with environmental contractors.	Due to the variety of methods expected to accomplish this work, there is some inherent risk involved in this item.	Moderate	Possible	2	
AS-9		0		Negligible	Unlikely	0	

AS-10	0			Negligible	Unlikely	0
AS-11	0			Negligible	Unlikely	0
AS-12	Remaining Construction Items			Negligible	Unlikely	0
AS-13	Planning, Engineering, & Design	PED is accomplished in-house and AS will not have any impact.	Acquisition strategy would have no affect on PED.	Negligible	Unlikely	0
AS-14	Construction Management	If AS affects the construction schedule this will have some impact on construction management.	Acquisition strategy could have some impact on construction management especially as it relates to schedule.	Marginal	Possible	1

Construction Elements					Maximum Project Growth	25%
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CE-1	Mobilization/demobilization - All Dredging	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-2	Pipeline Dredging	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-3	Clamshell Dredging	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-4	Rock Dredging	This item requires a specialized dredge to accomplish the work.	Rock dredging is the only portion of work that requires special equipment to perform the required work.	Moderate	Likely	3
CE-5	Hopper Dredging	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-6	Disposal Area Improvements	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-7	Aids to Navigation	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-8	Environmental Monitoring	No specialized equipment required for this element.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-9	0			Negligible	Unlikely	0
CE-10	0			Negligible	Unlikely	0
CE-11	0			Negligible	Unlikely	0

CE-12	Remaining Construction Items			Negligible	Unlikely	0
CE-13	Planning, Engineering, & Design	No specialized equipment required for this element. No affect on PED.	Standard construction methods required for most of this project with a normal schedule. Therefore, no special risks involved with construction elements.	Negligible	Unlikely	0
CE-14	Construction Management	Due to management of rock dredging, some impact may be experienced for this item.	Standard construction methods required for most of this project with a normal schedule. However, due to management of rock dredging some minor impact may be experienced.	Marginal	Possible	1
Quantities for Current Scope					Maximum Project Growth	20%
Q-1	Mobilization/demobilization - All Dredging	Additional mobilizations may be required due to environmental windows for hopper dredging activities.	The cost estimate is based on mob/demob of two 24" pipeline dredges for the reaches with inland disposal, two 26 CY clamshell dredges for the inner harbor reaches for offshore disposal, one 30" rock cutter dredge for expected rock in the entrance channel, one clamshell dredge with 14 CY rock bucket for hard bottom mitigation and one large and two medium hoppers for four months to complete required hopper	Moderate	Possible	2
Q-2	Pipeline Dredging	Quantities are based on difference between current authorized channel depth and depth for alternative and are based on surveys taken in 2013.	Quantities are not expected to increase significantly and may decrease as this estimate is based on maximum widenings which may be reduced after ship simulation in PED.	Moderate	Possible	2
Q-3	Clamshell Dredging	Quantities are based on difference between current authorized channel depth and depth for alternative and are based on surveys taken in 2013.	Quantities are not expected to increase significantly and may decrease as this estimate is based on maximum widenings which may be reduced after ship simulation in PED.	Moderate	Possible	2
Q-4	Rock Dredging	Quantities are based on difference between current authorized channel depth and depth for alternative and are based on core samples taken within the last year.	Quantities for rock dredging are conservative and are not expected to increase. Quantities were calculated for all areas at 1' below the bottom surface of the channel.	Moderate	Possible	2
Q-5	Hopper Dredging	Quantities are based on difference between current authorized channel depth and depth for alternative and are based on surveys taken in 2013.	Quantities are not expected to increase significantly and may decrease as this estimate is based on maximum widenings which may be reduced after ship simulation	Moderate	Possible	2
Q-6	Disposal Area Improvements	The quantities used to calculate cost for this item assumed a 5' dike elevation increase for all disposal areas and the creation of a cross dike in the Yellowhouse DA.	The need for raising dike elvation for all disposal areas is still being evaluated and the number of disposal areas requiring height increases may go down. In addition, the need for a cross dike at Yellowhouse may be eliminated.	Marginal	Unlikely	0
Q-7	Aids to Navigation	This cost was generated by the US Coast Guard and encompasses changes in navigation buoys and markers required with the expanded channel.	Cost was provided by outside source, but included all changes that will be required.	Marginal	Unlikely	0
Q-8	Environmental Monitoring	This cost is for environmental monitoring for a period of 9 years and is conservative.	This item is estimated on the conservative side. Therefore, any changes expected would be a decrease in cost.	Negligible	Unlikely	0
Q-9		0		Negligible	Unlikely	0
Q-10		0		Negligible	Unlikely	0
Q-11		0		Negligible	Unlikely	0
Q-12	Remaining Construction Items			Negligible	Unlikely	0

Q-13	Planning, Engineering, & Design	Quantity of dredged material could change.	PED for this project is planned for a set of activities that would not be significantly impacted by changes in project scope.	Negligible	Unlikely	0
Q-14	Construction Management	Quantity of dredged material could change.	Construction S&A would be affected by changes in material to be dredged and would need to increase accordingly.	Marginal	Possible	1

Specialty Fabrication or Equipment	Maximum Project Growth	75%
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FE-1	Mobilization/demobilization - All Dredging	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-2	Pipeline Dredging	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-3	Clamshell Dredging	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-4	Rock Dredging	Specialty dredge required for this part of the project.	Due to limited availability of rock cutter dredges, this item has risk.	Moderate	Possible	2
FE-5	Hopper Dredging	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-6	Disposal Area Improvements	No specialized equipment required for this element.	Standard earth moving equipment and methods required for this operation.	Negligible	Unlikely	0
FE-7	Aids to Navigation	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-8	Environmental Monitoring	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-9		0		Negligible	Unlikely	0
FE-10		0		Negligible	Unlikely	0
FE-11		0		Negligible	Unlikely	0
FE-12	Remaining Construction Items			Negligible	Unlikely	0
FE-13	Planning, Engineering, & Design	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0
FE-14	Construction Management	No specialized equipment required for this element.	Standard equipment and methods required for all operations except for rock dredging.	Negligible	Unlikely	0

Cost Estimate Assumptions	Maximum Project Growth	35%
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CT-1	Mobilization/demobilization - All Dredging	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-2	Pipeline Dredging	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-3	Clamshell Dredging	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-4	Rock Dredging	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-5	Hopper Dredging	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-6	Disposal Area Improvements	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Marginal	Possible	1	
CT-7	Aids to Navigation	Quote provided by USCG.	Cost was provided by outside source, but included all changes that will be required.	Negligible	Unlikely	0	
CT-8	Environmental Monitoring	Conservative time period used in estimate.	Cost estimate based on 9 years of monitoring. May be reduced after after 5 years if no significant impacts are noted and mitigation efforts are effective.	Negligible	Unlikely	0	
CT-9		0		Negligible	Unlikely	0	
CT-10		0		Negligible	Unlikely	0	
CT-11		0		Negligible	Unlikely	0	
CT-12	Remaining Construction Items			Negligible	Unlikely	0	
CT-13	Planning, Engineering, & Design	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Negligible	Unlikely	0	
CT-14	Construction Management	Best available data used to develop cost for this element.	All cost estimating assumptions based on best available data on current and expected conditions at the time of construction.	Negligible	Unlikely	0	
External Project Risks						Maximum Project Growth	40%
EX-1	Mobilization/demobilization - All Dredging	Unexpected rises in fuel cost could impact this element.	Fuel cost have an impact on this item. However, escalation is accounted for in the TPCS. Only increases outside of the expected range would have additional impact.	Marginal	Possible	1	
EX-2	Pipeline Dredging	Unexpected rises in fuel cost could impact this element.	Fuel cost have an impact on this item. However, escalation is accounted for in the TPCS. Only increases outside of the expected range would have additional impact.	Marginal	Possible	1	

EX-3	Clamshell Dredging	Unexpected rises in fuel cost could impact this element.	Fuel cost have an impact on this item. However, escalation is accounted for in the TPCS. Only increases outside of the expected range would have additional impact.	Marginal	Possible	1
EX-4	Rock Dredging	Unexpected rises in fuel cost could impact this element.	Fuel cost have an impact on this item. However, escalation is accounted for in the TPCS. Only increases outside of the expected range would have additional impact.	Marginal	Possible	1
EX-5	Hopper Dredging	Unexpected rises in fuel cost could impact this element.	Fuel cost have an impact on this item. However, escalation is accounted for in the TPCS. Only increases outside of the expected range would have additional impact.	Marginal	Possible	1
EX-6	Disposal Area Improvements	Adverse weather may impact the schedule for preparation of the disposal areas.	Due to the relatively long duration of work on the various sites, weather such as Tropical Storms or Hurricanes can have an impact.	Marginal	Possible	1
EX-7	Aids to Navigation	External risks should not affect this item.	Short duration of effort should not be affected by weather and work performed by another DOD service reduce the risk of this item.	Negligible	Unlikely	0
EX-8	Environmental Monitoring	External risks should not affect this item.	Monitoring can be scheduled around any adverse weather conditions and should not be affected by any other external items.	Negligible	Unlikely	0
EX-9		0		Negligible	Unlikely	0
EX-10		0		Negligible	Unlikely	0
EX-11		0		Negligible	Unlikely	0
EX-12	Remaining Construction Items			Negligible	Unlikely	0
EX-13	Planning, Engineering, & Design	External risks should not affect this item.	External risks should not affect PED.	Negligible	Unlikely	0
EX-14	Construction Management	Adverse weather conditions could affect the project schedule and thus impact the cost of this element.	Adverse weather could extend the overall project schedule. This would cause additional labor time for construction management.	Marginal	Possible	1