

Milestone	Risk Number	Date	Scoping Choice or Event	Risk and its cause	Risk Type	Consequence	Consequence rating	Evidence for Consequence rating	Likelihood rating	Evidence for likelihood rating	Uncertainty rating	Risk Rating	Risk Management Options	Conclusion/ Recommendation	POC	Affected Study Component
SMART milestone or IPR (for summary sheet only)	id number	Date entry was last updated	This is the scoping choice (task, decision, problem, question, issue) or event (action, hazard or opportunity) that is to be managed.	Briefly identify the risk. Considering the entry in column B, what can go wrong as a result of the scoping choice or event and how can it happen?	Select: Study Risk (Analytical error, study delays, study cost increase, poor planning decision), Implementation Risk (schedule and cost of implementation, redesign), or Outcome Risk (hazard risk and project performance risk)	Describe the consequence of the column E risk. If things do "go wrong" in the way described what is the specific consequence for the study or project outcomes? (List the most significant consequence first if more than one.)	If the most significant consequence in column G occurs what is its potential magnitude?	Enter specific evidence used to support the consequence rating in column H. If relying on an event from a previous study, list study and date.	What is the likelihood that the most significant consequence in column G will occur?	Enter specific evidence used to support the likelihood rating in column J. If relying on an event from a previous study, list study and date.	How great is the uncertainty about either the consequence or likelihood of the risk identified in column E?	Qualitative risk rating from lookup table.	Enter options for reducing the risk and estimate time/cost impacts associated with the management option.	Identify any preferred recommendation for managing the risk. Tolerating the risk is the default option.	Name(s) of person(s) assessing the task and responsible for task	What other analyses of the study are affected by this risk? For example, what other analyses use outputs from the scoping choice as their input.
GEOTECHNICAL																
Pre-scope	GEO-01	12-Jul-12	Assume in schedule that groundwater modeling is not required to determine impact to groundwater intakes for water supply, because most of water supply in harbor area comes from surface water. Use existing data to evaluate impacts of deepening model is required.	Determine later on in the study that groundwater is required.	Study Risk	Major impact to water supply to those who use groundwater if groundwater is affected by deepening.	Medium	Assume in schedule that groundwater modeling is not required to determine impact to groundwater intakes for water supply, because most of water supply in harbor area comes from surface water. Use existing data to evaluate impacts of deepening to groundwater use.	Low	Bottom of River is not penetrated with proposed new project depths, thereby not impacting intakes in water supply wells. Also, predominant water supply is from Surface Water Sources	Low	Low	(1)Perform detailed analysis of USGS Water Supply Reports (2)Perform groundwater modeling	(1)Perform analysis but no modeling		EIS
Pre-scope	GEO-02	12-Jul-12	Cost estimate for deepening outside existing channel depends on material type. Ultimately, type and strength of material (i.e., soft rock, hard rock, sediment, etc.) will assist in determination of removal method.	Limited information concerning nature of offshore (seaward of existing channel entrance) material to be removed when deepening. No rock strength data for the entrance channel extension exists.	Study Risk	Quantity and Competency of rock overestimated. Cost Estimates are high.	High	No subsurface information in 3-mile extension	High	Currently no subsurface information in 3-mile extension.	Medium	High	(1)Use geophysical information in 3 mile extension (2)Wash probes if rock identified in geophysical (3)Rock borings and strength testing if presence of rock is potentially significant	Sub-bottom profiling, and follow up with wash probes and coring testing if needed.		Cost Estimating
Pre-scope	GEO-03	12-Jul-12	Areas in outer 1/3 of entrance channel are shallower than -52 ft MLLW. Also, this area has some of the highest blow count material as shown in entrance channel borings. Rock was encountered in many areas during subsurface investigation. However, strength data is not available in this area. Also, unfiled soil classification system designations used for material that is most likely rock.	There is no strength data, or rock mass data in much of the entrance channel. Dredge records indicate that the hopper dredges encountered hard material which the hopper could not dredge	Study Risk	dredging method, time and costs for significant portion of entrance channel could be over- or underestimated, thereby affecting overall BCR	High	Areas in outer 1/3 of entrance channel are shallower than -52 ft MLLW. Also, this area has some of the highest blow count material as shown in entrance channel borings. However, strength data is not available in this area. Also, unfiled soil classification codes are used for material that is most likely rock.	High	During last deepening, rock was encountered in locations of entrance channel during dredging in some locations where it was not originally identified. Newly proposed Study depths are below extent of subsurface information	High	High	(1)Use geophysical information in 3 mile extension (2)Wash probes if rock identified in geophysical (3)Rock borings and strength testing if presence of rock is potentially significant	Sub-bottom profiling, and follow up with wash probes and coring testing if needed.		Cost Estimating
	GEO-04	28-Sep-12	Assume no blasting in entrance channel in EIS.	The PDT Team has to move forward with preparation of the EIS and coordination with Fish & Wildlife Service and NOAA Fisheries before the geotech sampling of the entrance channel is completed.	Implementation Risk	if blasting is determined to be necessary after the geotech samples are collected, then consultation with F&WS and NOAA Fisheries will have to be re-initiated. The likely outcome of needing to blast will be significant mitigation to protect endangered species from harm.	High	Previous experience	Low	Based on current information, the material will be able to be dredged with a large cutterhead dredge. However, since we will be dredging deeper than previous dredging has occurred and rock strength tends to increase with depth, there is a possibility that blasting will be necessary.	Medium	Medium	Perform geotech testing earlier in the project.	Keep geotech testing as currently scheduled.		Geotech sampling in entrance channel, Draft and Final EIS schedule, Chief's report schedule.
ENVIRONMENTAL																
Pre-scope	ENV-01	1-Oct-11	Full air dispersion modeling will be required	EPA could insist on modeling at the end of the process. This will extend the time period and cost significantly.	Study Risk	Addition of this activity could add year(s) and approx. \$1M to the study. If early indications show that it'll be necessary than it might not delay AFB.	High	Addition of this activity could add year(s) and approx. \$1M to the study. If early indications show that it'll be necessary than it might not delay AFB.	Medium	Discussions with EPA suggest that air modeling is preferred in order to document impacts to low income, minority populations and children. Env Justice issues	Medium	High	(1)Do Nothing (2)Meet with EPA/DHCE now to discuss the issue and how they will evaluate the need.	Perform an assessment of the air quality and potential impacts in advance of making a decision on whether or not to perform full modeling.		the NED plan could be affected if we are challenged by EPA on impacts to these communities. Might require mitigation cost increases.
Pre-scope	ENV-02	1-Oct-11	Will use existing data only for topo/data of marshes in upper River	Existing data may not prove accurate enough for impact determinations required by resource agencies	Study Risk	EFDC data collection might take longer, or have additional parameters added to it. Since EFDC will not be used for the FSM meeting, it should not delay FSM. Might cause a delay to AFB.	Medium	Resolution of existing EFDC grid may be too coarse for the level of analysis we'll be asked to perform. EFH and T&E species assessments	High	multiple ICT meetings have informed us of these agency concerns early on. This is good for the project to recognize these concerns	Medium	High	ICT meetings will inform decision on whether this is a good decision/assumption. Use sea level rise estimates as a first step	Have early ICT meetings to thoroughly ascertain the needed data to accomplish this impact assessment.		the NED plan could be affected if we are challenged by EPA on impacts to these communities. Might require mitigation cost increases.
Pre-scope	ENV-03	1-Oct-11	Sediment testing for 103 concurrence	the District is determining whether or not to test upper harbor material for 103 concurrence from EPA (as per the MRPSA).	Study Risk	If the PDT decides to take the material offshore at a later date, further testing would be required at an estimated expense of ~\$500K.	High	Upper harbor material historically goes toCDF. The cost of disposal offshore might be too much to justify, when it could be pumped via hydraulic cutterhead to the CDF. Additionally, empirical evidence elsewhere in the River indicates that the channel might not be suitable for ocean disposal	Low	Upper harbor material historically goes toCDF. The cost of disposal offshore might be too much to justify, when it could be pumped via hydraulic cutterhead to the CDF. Additionally, empirical evidence elsewhere in the River indicates that the channel might not be suitable for ocean disposal	Low	Medium	(1)Perform quantity and cost estimates early in the process to determine the likelihood of disposal offshore (2)Assume upper harbor material will not be taken to OODMS even if EPA gives concurrence (3)Assume upper harbor material would go to OODMS if concurrence granted	Early coordination with cost. If the costs are relatively close, recommend testing all material for 103.		DMMP
Pre-scope	ENV-04	1-Oct-11	assume minimal impacts and minimal mitigation, in order to push schedule to the left	The project may impact water quality (Dissolved Oxygen) and freshwater wetlands, which could in turn impact T&E species and EFH	Study Risk	could require reconfiguration of alternatives, or other requirements.	High	area is impaired for dissolved oxygen. Small predicted changes could cause us to have to mitigate for those changes.	High	Mitigation of some sort will almost certainly be required. The schedule indicates a short duration for mitigation planning.	High	High	(1)coordinate with state/federal agencies early to obtain feedback on resources of concern and the perceived mechanisms for impacts (2)assume no significant impacts from project, but perform impact analyses to determine and coordinate with state/federal agencies after an assessment is complete (3)assume there will be significant impacts and perform detailed analyses of all potential resources to be impacted	Early Coordination! Look for mitigation assessment to run concurrently during alternative formulation phase.		NED plan and EIS
Pre-scope	ENV-05	1-Oct-11	Haz. Tox. Rad Waste	Only doing a Phase I HTRW inspection, and not doing further surveys	Study Risk	More work	Low	Dredging has occurred in these channels for over 100 years and maintenance dredging on a 12-18 month rotation. New wideners, turning basins, extensions would be where the risk is. Since we'll be doing magnetometer work and side scan sonar for cultural resources, as well as benthic grabs, this risk is further minimized	Low	Dredging has occurred in these channels for over 100 years and maintenance dredging on a 12-18 month rotation. New wideners, turning basins, extensions would be where the risk is. Since we'll be doing magnetometer work and side scan sonar for cultural resources, as well as benthic grabs, this risk is further minimized	Low	Low	(1) Perform a Phase I HTRW inspection (2) Perform additional analysis above and beyond the Phase I inspection	Perform a Phase I HTRW inspection		NA
Pre-scope	ENV-06	1-Oct-11	Erosion to shorelines and historic sites	Larger ships could have larger wakes that would impact shorelines and historical sites near the project	Outcome Risk	Mitigation might be required. Could be in the form of beneficial use of dredged material.	Medium	Preliminary discussions indicate that the larger ships, when traveling in a harbor, do not produce larger wakes. Water displacement from the larger ships is also a concern as the changing water elevations might erode or cause stability issues for shorelines and/or historic sites	Low	Will take a shoreline assessment using ship wake data and past reports, but shouldn't be a major problem	Low	Low	(1)Perform literature search on other vessel wake analyses (2)Perform vessel wake analysis (Qualitative) (3)Perform detailed vessel wake analysis (quantitative)	Perform literature search and qualitative analysis		affects the determination of widening measures
Pre-scope	ENV-07	1-Oct-11	401 Water Quality Certification/ Coastal Zone Consistency restricted or denied	water quality impact concerns	Study Risk	A denied 401 would mean significant state concerns regarding impacts to water quality, PR issues with project.	High	State 401 WQ and CZM certifications challenged for SHEP	Low	not planning on deepening too far up	Low	Medium	(1)Under some circumstances, the Corps may proceed despite WQ or CZM denial (2)options from #4 above if Jeopardy is expected, can modify plan with reasonable and prudent alternatives. Can pursue an incidental take statement/Apply for exemption, etc. Early consultation, discussions with resource agencies is important.	Keep in constant contact and working with partners to address all issues they bring up		affects mitigation planning, T&E species, EFH, etc
Pre-scope	ENV-08	1-Oct-11	Need to avoid putting threatened and endangered species in jeopardy	Impacts to T&E Species as determined by USFWS or NMFS	Study Risk	Project can be halted unless approved by Committee for Endangered Species	High	Shortnose sturgeon is important because NMFS previously issued a draft jeopardy opinion	Low	NMFS/USFWS/DNR will help	Medium	Medium	Constant coordination with USFWS/NMFS			cost and time to construction
Pre-scope	ENV-09	1-Oct-11	Environmental issues related to fleet/commodity forecast (i.e., air quality, socioeconomic, environmental justice, ship wake assessment, etc.)	using one fleet/commodity forecast throughout the study. Using forecast of future is inherently unknowable and there is risk that it will need to be revisited prior to the end of the project.	Study Risk	Will have to redo some aspects of the EIS if these forecasts change throughout the project	Medium	Might need to go back and get a new forecast. Multiple updated forecasts have been required for previous reviews	Medium	past studies have needed to refine these forecasts multiple times	Medium	Medium	(1) wait until just prior to AFB before performing analyses based on those forecasts, (2) current path and risk do-overs	wait until just prior to AFB before performing analyses based on those forecasts		affects air quality forecasts
Charette	ENV-10	21-Jun-12	Cultural Resources - use existing data to make a preliminary determination of impacts to submerged resources. Actual survey data wouldn't be known until MS2	We wouldn't 100% know if we weren't going impact any significant resources	Study Risk	Consequence would be that the ISP would need to be reformulated to avoid a resource, or to mitigate for the impact to the resource.	Medium	The ISP may need to be adjusted to minimize impacts to, and/or avoid impacts to any historical resources. It is medium risk because much of the harbor has been surveyed.	Low	We are not expanding too far outside the current project footprint	Medium	Low	Since we know we'll need to do those and we've narrowed down the areas to survey, recommend sooner rather than later			affects mitigation planning.
Charette	ENV-11	21-Jun-12	Sediment Quality - Assume no sediment testing prior to MS1. Use existing knowledge to assume that lower harbor and entrance channel material will be able to be disposed of offshore. Related to MRPSA 103	Without testing we will not have data to confirm this	Study Risk	the material ends up not being approved by EPA for ocean disposal. Results in the District having to reformulate plans to find adequate disposal capacity.	Medium	Cost of disposing of material in an upland site would be exorbitant. Also, time involved would increase because of the need to ditch and dike as we go along.	Low	reasonable assurance from current data and recent maintenance testing that this won't happen. Maintenance material stands the greatest chance of containing any contamination.	Low	Low	test it now.	Data won't be available by MS1 anyway. Need to start asap due to long completion time		disposal areas
Charette	ENV-12	21-Jun-12	Sediment Quality - Assume no testing prior to MS1 for the upper harbor, and material disposed of. Assume that there will be a cost associated with special handling	Without testing we will not have data to confirm this from evidence from piers adjacent to federal channel	Study Risk	cost will be lower and BC goes up	Medium	taking material to the CDF isn't a bad option. Even if contaminated, special management measures can be taken.	Medium	since maintenance and new work material is dredged together we have reason to believe sediment data from piers in the area) that sediment could be contaminated.	Medium	Medium	test it now.	test for ocean disposal and keep the disposal options open		beneficial uses are dependent upon material type.
Charette	ENV-13	21-Jun-12	Air Quality - assume no impacts to air quality for MS1, with existing and SPA data	Without the inventory and forecast we will not have data to confirm this.	Study Risk	could make the ISP different from the TSP	Low	It's only an interim plan so changes aren't that risky	Low	preliminary looks at the economics don't indicate more commodities and larger fleet	Medium	Low	discuss it thoroughly at MS1. document what will occur for MS2	discuss it thoroughly at MS1. document what will occur for MS2		plan selection
Charette	ENV-14	21-Jun-12	Water Quality - will need to use existing data and best professional judgement to determine incremental impacts to DO and other water quality parameters. Existing data includes the recent preliminary EFDC model runs based on old data and coarse grids; model runs were made at 49 and 52 feet, and we will need to extra-interpolate the increments in between	Overestimate DO impacts and/or underestimate and give economics a cost for mitigation that is inaccurate and will need to be adjusted between MS1 and MS2	Study Risk	unnecessarily alert public to problems that may not exist. High mitigation costs. Lots of time and money spent on mitigation research costs.	Medium	Other port projects very aware of water quality concerns. DO mitigation will not be taken lightly. Nor should it. A lot of time will go into studying the best mitigation alternatives.	High	refining grids will almost certainly more adequately and accurately project impacts	Medium	High	Need to discuss in detail that we're expediting the project and that the impacts will be studied in the future prior to project selection. And fine tuned during the PED phase with ship simulation. Monitoring and adaptive management will be crucial to project success.	write carefully. Start EFDC ASAP		lots of the project
Charette	ENV-15	21-Jun-12	Salinity impacts to marshes based on EFDC rough estimate model and existing DNR data.	give econ the wrong cost. Will need to reformulate the IP later. Risk of alerting public to an issue that may not be a real issue.	Study Risk	impact footprint could be wrong (more or less) most likely on the high side. Will involve more extensive RE work	Medium	mitigation in coastal salt marshes difficult to find compensatory sites.	High	model will undoubtedly show different impacts than the best guess now.	Low	High	research past projects and how they deal with knowing that more studies are ongoing between DEIS and FEIS.	write carefully. Start EFDC ASAP		mitigation plan development, NED
Charette	ENV-16	21-Jun-12	not determining the existing conditions and without project condition now (prior to MS1)	MS1 is essentially an FSM. Since FSM usually has the existing condition and FVOP condition complete, we need to ensure that SAD and HQ will approve our document even though the writeup won't be complete (because much of the actual data collection and writeup will come before MS2). If we delay the determination of existing conditions and FVOP conditions we could delay getting to MS2 depending upon ATR, and policy review	Study Risk	schedule moves to right	Medium	with the push to make studies shorter this will not be favorable	Medium	you have to have existing and FVOP before you do alternatives. Need a baseline to compare it too	Low	Medium	make sure ATR team knows about this risk register and the efforts to reduce costs. Vertical team buy-in of the effort	write carefully.		MP 1 is essentially an FSM. MSC and HQ might not approve it if the District says that we KNOW that the existing conditions will be different when we complete MS2 (or AFB).
Charette	ENV-17	21-Jun-12	Prior to MS1, developing an estimate for mitigation costs to give to econ in order to more appropriately inform a benefit cost analysis	we could grossly overestimate or even underestimate the actual mitigation cost. This will either lower or raise the BC ratio and could impact the assumption of using the IP to carry forward in a detailed alternative analysis.	Study Risk	redoing the BC analyses	Low	We assumed we'd be going through multiple iterations of the planning process anyway	High	slim chance the econ is done at end of MS1	High	Medium	use sound science and best available data	work well with resource agencies for their advice and help		NED plan and EIS

Milestone	Risk Number	Date	Scoping Choice or Event	Risk and its cause	Risk Type	Consequence	Consequence rating	Evidence for Consequence rating	Likelihood rating	Evidence for likelihood rating	Uncertainty rating	Risk Rating	Risk Management Options	Conclusion/ Recommendation	POC	Affected Study Component
SMART milestone or IPR (for summary sheet only)	ID number	Date entry was last updated	This is the scoping choice (task, decision, problem, question, issue) or event (action, hazard or opportunity) that is to be managed.	Briefly identify the risk. Considering the entry in column B, what can go wrong as a result of the scoping choice or event and how can it happen?	Select: Study Risk (Analytical error, study delays, study cost increase, poor planning decision), Implementation Risk (schedule and cost of implementation, redesign), or Outcome Risk (hazard risk and project performance risk)	Describe the consequence of the column E risk. If things do "go wrong" in the way described what is the specific consequence for the study or project outcomes? (List the most significant consequence first if more than one.)	If the most significant consequence in column G occurs what is its potential magnitude?	Enter specific evidence used to support the consequence rating in column H. If relying on an event from a previous study, list study and date.	What is the likelihood that the most significant consequence in column G will occur?	Enter specific evidence used to support the likelihood rating in column J. If relying on an event from a previous study, list study and date.	How great is the uncertainty about either the consequence or likelihood of the risk identified in column E?	Qualitative risk rating from lookup table.	Enter options for reducing the risk and estimate time/cost impacts associated with the management option.	Identify any preferred recommendation for managing the risk. Tolerating the risk is the default option.	Name(s) of person(s) assessing the task and responsible for task	What other analyses of the study are affected by this risk? For example, what other analyses use outputs from the scoping choice as their input.
GEOTECHNICAL																
Pre-Rescope	GEO-01	12-Jul-12	Assume in schedule that groundwater modeling is not required to determine impact to groundwater intakes for water supply, because most of water supply in harbor area comes from surface water. Use existing data to evaluate impacts of deepening to groundwater use.	Determine later on in the study that groundwater model is required.	Study Risk	Major impact to water supply to those who use groundwater if groundwater is affected by deepening.	Medium	Assume in schedule that groundwater modeling is not required to determine impact to groundwater intakes for water supply, because most of water supply in harbor area comes from surface water. Use existing data to evaluate impacts of deepening to groundwater use.	Low	Bottom of River is not penetrated with proposed new project depths, thereby not impacting intakes in water supply wells. Also, predominant water supply is from Surface Water Sources	Low	Low	1) Perform detailed analysis of USGS Water Supply Reports 2) Perform groundwater modeling	1) Perform analysis but no modeling		EIS
Pre-Rescope	GEO-02	12-Jul-12	Cost estimate for deepening outside existing channel depends on material type. Ultimately, type and strength of material (i.e., soft rock, hard rock, sediment, etc.) will assist in determination of removal method.	Limited information concerning nature of offshore (seaward of existing channel entrance) material to be removed when deepening. No rock strength data for the entrance channel extension exists.	Study Risk	Quantity and Competency of rock overestimated. Cost Estimates are high.	High	No subsurface information in 3-mile extension	High	Currently no subsurface information in 3-mile extension.	Medium	High	1) Use geophysical information in 3 mile extension 2) Wash probes if rock identified in geophysical 3) Rock borings and strength testing if presence of rock is potentially significant	Sub-bottom profiling, and follow up with wash probes and coring testing if needed.		Cost Estimating
Post-Charette	ENV-19	10-Jul-12	No numerical (EFDC) modeling for milestone 2	Interpolations and estimates must be made that may be incorrect. Study will not adequately assess impacts from the project on salinity intrusion, fisheries impacts, wetland changes, water quality concerns, etc.	Study Risk	Selection of the wrong TSP. BCR is off, certifications/approvals will not be obtained, EIS will be difficult to defend. This component is one of the biggest studies that we can do to develop a defensible product. The agencies are keenly aware of this. Not doing the modeling will result in questions that the District won't be able to accurately answer. If we can't defensibly answer questions we might have to do the modeling after the fact which would result a new BCR, and potentially project.	High	EFDC model reduces uncertainty in several key areas by addressing 1. currents that drive all of the sediment rates, salinity rates and water quality impacts, 2. environmental impacts such as wetlands, DO, TMDLs, fish and wildlife, essential fish habitat, T&E species, 3. shoaling rates needed for O&M costs, 4. salinity intrusion 5. ship simulation.	High	Existing information is based on very rough estimate of impacts and not all impacts can be identified with the existing model.	High	High	perform numerical modeling as soon as possible	perform numerical modeling as soon as possible		environmental impacts, Biological Assessment, EFH Assessment, 401 certification, 404b writeup, EIS, coastal zone consistency determination, costs of mitigation, cost estimate, BC ratio, selected plan.
Post-Charette	ENV-20	10-Jul-12	Assume maximum widenings for all alternative EFDC runs for milestone 2. Deferring ship simulation until PED to determine best footprint.	select incorrect footprint	Study Risk	1. overestimate quantities 2. cost estimates too high 3. overestimate environmental impacts 4. BCR incorrect Cause public concerns that might not actually be warranted.	Medium	ship simulation will determine if we really need the maximum widenings or could use something less costly.	Medium	ship simulation has reduced channel footprint in the past	Medium	Medium	perform ship simulation prior to selection of TSP in order to narrow down areas that don't need to be widened.	perform ship simulation prior to selection of TSP in order to narrow down areas that don't need to be widened.		environmental impacts, costs of mitigation, cost estimate, BC ratio, selected plan.
Post-Charette	ENV-21	10-Jul-12	No Sediment Sampling during study phase	We will not receive a section 103 concurrence from EPA in order to dispose of material in the ODMDS. We will also not receive 401 WQ certification and CDM consistency. This could result in the District not being able to dispose of material in the ODMDS and upland disposal areas.	Implementation Risk	We will not receive a section 103 concurrence from EPA in order to dispose of material in the ODMDS. We will also not receive 401 WQ certification and CDM consistency. This could result in the District not being able to dispose of material in the ODMDS and upland disposal areas.	High	MPSRA 103 regs requires testing in order to dispose of material offshore	High	MPSRA 103 regs requires testing in order to dispose of material offshore	None	High	Perform sediment testing prior to milestone 2, and as soon as possible.	Perform sediment testing prior to milestone 2, and as soon as possible.		environmental impacts, Biological Assessment, EFH Assessment, 401 certification, 404b writeup, EIS, coastal zone consistency determination, costs of mitigation, cost estimate, BC ratio, selected plan.
Post-Charette	ENV-22	10-Jul-12	Performing detailed studies after the DEIS has been published	The District will have to write in the DEIS that certain studies have not been completed yet, and that they will be prior to the final EIS.	Study Risk	If this happens, the public will only have one review time (FEIS) to read the project impacts and comment on them. There is a chance that the District would be in a position to release a second draft for public review prior to the release of the FEIS.	Medium	there is a chance that the public/agencies would demand additional review time, since this approach essentially reduces the public review time by over 50%, thereby reducing transparency	Medium	don't really know. Haven't found anything precedent setting	High	Medium	write carefully	use sound science and best available data		time between DEIS and FEIS
Post-Charette	ENV-23	10-Jul-12	ODMDS expansion completed after Draft EIS	The District has to perform a variety of tasks in order to get a section 102 site modification for the ODMDS. These tasks (wave/currents, arch, bathy) need to be performed as soon as possible to ensure timely completion	Study Risk	without an ODMDS that can be shown to accommodate the new work material and 50 years of maintenance it is not likely that the feasibility study will be approved.	Medium	planning guidance notebook	Low	depends on the review climate up the vertical chain.	Medium	Low	Do ODMDS concurrently. Make all efforts to finish it as close to simultaneously as possible	Do ODMDS concurrently. Make all efforts to finish it as close to simultaneously as possible		completion of report, chief's report.
HH																
	HH-01	22-Jun-12	Update existing model by improving grid resolution and vertical layers and calibrate to new data to determine final plan for milestone 4	Model will not reflect all possible future conditions	Study Risk	1. May miss some potential impacts. 2. May require more collaboration with agencies for more modeling or more monitoring.	Medium	Model has been used before, agencies are familiar with it, coordinations with agencies to date.	Medium	agencies have already mentioned monitoring.	Low	Medium	Update and improve resolution of grid	Update and improve resolution of grid - since calibration is a big portion of time and cost of further modeling - it seems logical to go ahead and improve grid resolution at the same time - a little more time gives a bigger reduction in uncertainty.		environmental impacts, costs of mitigation, cost estimate, BC ratio, selected plan.
	HH-02	22-Jun-12	Assume maximum widenings for all alternative EFDC runs for milestone 4. Don't do ship simulation to determine best footprint	select incorrect footprint	Study Risk	1. overestimate quantities 2. cost estimates too high 3. overestimate environmental impacts 4. BCR incorrect	Medium	ship simulation will determine if we really need the maximum widenings or could use something less costly.	Medium	ship simulation has reduced channel footprint in the past	Medium	Medium	perform ship simulation prior to selection of TSP or even recommended plan	Postponed to PED		environmental impacts, costs of mitigation, cost estimate, BC ratio, selected plan.
	HH-03	26-Jun-12	postpone ship simulation to PED	don't have NED plan, select incorrect footprint	Study Risk	1. don't have NED plan 2. cost estimates too high 3. overestimate environmental impacts 4. BCR incorrect	High	ship simulation will determine if we really need the maximum widenings or could use something less costly.	Medium	ship simulation has reduced channel footprint in the past	Medium	High	perform ship simulation prior to completion of Feasibility study	Postponed to PED		environmental impacts, costs of mitigation, cost estimate, BC ratio, selected plan.
	HH-04	26-Jun-12	postpone analysis of BUD to PED phase	1. are there BUD? no estimate of costs or benefits 2. impacts of BUD? 3. possibly mitigation?	Study Risk	No analysis don't know if BUD exists and no analysis of BUD impacts	Medium	BUD analysis will meet agency and public comments, possibly provide mitigation - needed for costs	Medium	Agencies and public have asked about BUD frequently, identified as possible mitigation	Medium	Medium	perform BUD in Feasibility phase	Postponed to PED		environmental benefits, public concerns, agency concerns, mitigation.
	HH-05	26-Jun-12	postpone coastal impacts analysis to PED phase	1. no identification of coastal impacts that require mitigation? 2.	Study Risk	are there coastal impacts? Is Mitigation required? What are the Costs?	Medium	coastal analysis will meet agency and public comments, determine if mitigation is required and what cost of mitigation will be.	Medium	Public comments have asked about coastal impacts, possible BUD, other mitigation that might be needed.	Medium	Medium	perform coastal modeling/analysis	Postponed to PED		impacts, mitigation, BUD, Public concerns
	HH-06	26-Jun-12	postpone storm surge impacts to PED phase	1. won't know if project impacts storm surge until PED phase due to lack of analysis	Study Risk	mitigation required to offset storm surge impacts, costs of mitigation required	Medium	storm surge analysis will determine if there are impacts that require mitigation, that would affect costs	Medium	public comments asked about coastal impacts.	Medium	Medium	1. perform storm surge modeling in feasibility phase	Postponed to PED		costs, plan selection, NED
	HH-07	10-Nov-11	contract for data collection set to 60 days	Duration/timing of EFDC data collection effort does not allow for deployment during multiple seasons. Insufficient data collection on the front end could result in going back later for additional data which then requires additional modeling time for calibration.	Study Risk	impact schedule, impact to study cost	Medium	1. agencies wanted 1 year of data collection for better calibration seasonally 2. feedback from EPA with concerns over TMDL and other feedback from resources agencies concerning salinity intrusion. 3. Weather difficulties with data collection.	Medium	won't know until modeling if more data was needed	Medium	Medium	Put option in SOW to collect additional data in excess of 45 day minimum. Receive deliverable after 45 day minimum, but keep instrumentation deployed to collect additional data that you may not need. Additional cost to keep equipment deployed.	scope for 60 days of field data collection		model calibration
	HH-08	10-Nov-11	EFDC existing/FWO modeling reduced to 120 days duration	May need longer to calibrate models - calibration time is unknown	Study Risk	impact schedule, impact to study cost	High	May need longer to calibrate models - calibration time is unknown	Medium	won't know until modeling if calibration takes longer	Medium	High	increase duration and extend schedule	keep scope to 39 week total to final report		impacts, mitigation.
	HH-09	10-Nov-11	EFDC alternatives assumed to be 10	may need more alternatives to get to NED	Study Risk	impact schedule, impact to study cost	High	unknown how many alternatives to get to NED, 5 lower harbor depths, 3 upper harbor depths, bend easings, turning basins, widenings...	Medium	historically NED not done in only 10 alternatives for project this complex	Medium	High	1) Screen alternatives by other methods prior to modeling 2) Accept risk that alternatives will number more than 10 3) Increase resources assigned to alternatives modeling to overcome schedule slip if alternatives number more than 10	screen alternatives, use maximum widenings, easings, TN only		NED selection, impacts, mitigation
	HH-10	10-Nov-11	EFDC alternative duration limited to 60 days	may need more time to modify grid, sensitivity analysis for alternatives	Study Risk	impact schedule, impact to study cost	High	unknown how many alternatives to get to NED	Medium	previous studies have taken longer	Medium	High	reduce number of alternatives to be evaluated. Apply more resources if available	reduce number of alternatives to be evaluated. Apply more resources if available		NED selection, impacts, mitigation
	HH-11	10-Nov-11	duration to 40 days to assess mitigation requirements of EFDC	may need more time to assess impacts and mitigation requirements	Study Risk	impact schedule, impact to study cost	High	mitigation requirements are unknown at this time, modifications to EFDC model unknown at this time	Medium	previous studies have taken longer	High	High	reduce number of alternatives to be evaluated. Apply more resources if available	reduce number of alternatives to be evaluated. Apply more resources if available		NED selection, impacts, mitigation
	HH-12	10-Nov-11	Using existing studies for vessel wake analysis rather than new ERDC study	may still have to do the ERDC study if deemed insufficient	Study Risk	impact schedule, impact to study cost	Medium	existing data may be insufficient due to lack of information on post panamax ships	Medium	won't know until analysis done/ EFDC analysis would be required	Medium	Medium	perform ERDC analysis at higher cost and longer study schedule	Using existing studies for vessel wake analysis rather than new ERDC study		impacts, mitigation.
	HH-13	6-Jul-12	Assumed no need for additional WQ data to support EFDC modeling	unknown impact on WQ and whether model will accurately assess it.	Study Risk	major schedule impact - dependent on duration of data collection required.	High	existing data may be insufficient	Low	discussions seem to be acceptable of our not gathering new data	Medium	Medium	collect more data in PED and reassess impacts for mitigation requirements	wait and see if need to collect more data in PED and reassess impacts for mitigation requirements		impacts, mitigation.
	HH-14	10-Nov-11	EPA has not identified TMDL for river	need before impacts of alternatives can be addressed to look at impacts at day 1 post construction - will require more time for looking at impacts - rerunning the model, possible more alternatives	Study Risk	mitigation requirements will be unknown if there is an impact due to the project	High	other studies have had huge mitigation costs for TMDL impacts	Medium	heavy harbor was required to look at impacts at day 1 post construction - required more time to rerun the model, possible more alternatives	Low	High	modify grid for WQ model, re-evaluate in PED with outer footprints	modify grid for WQ model, re-evaluate in PED with outer footprints		impacts, mitigation, project cost
	HH-15	10-Nov-11	Assume alternatives will be compared to FWO condition	outside existing scope - will require different models, coordination, may affect alternatives...	Study Risk	impact schedule, impact to study cost	High	NMFS letter during scoping	Medium	previously required, but that was before SMART planning	Medium	High	1. perform additional evaluations in PED if required	1. perform additional evaluations in PED if required		alternatives and mitigation.
	HH-16	10-Nov-11	NMFS recommendation to look at river flows	inaccurate prediction of future condition and project impacts	Study Risk	inaccurate prediction of project impacts	High	agencies have concerns about impacts in the future and whether we can accurately predict them.	Medium	comments from agencies	Medium	High	This activity is beyond the scope of this project 1. perform other future condition prediction models but that would lengthen study and increase study cost and still not meet agency's requirements. 2. monitoring plan which agencies will probably require anyway	This activity is beyond the scope of this project		alternatives and mitigation, project cost
	HH-17	10-Nov-11	FWO conditions assumed to be same as existing but with SLR	schedule did not assume multipole SLR scenarios - will require more model runs and time, increase in costs	Study Risk	schedule did not assume multipole SLR scenarios - will require more model runs and time, increase in costs	High	if required to do this it will require more time and money	Medium	we can ignore them but they may hold up approvals	Medium	High	try to hold off until PED if it becomes an issue. Assume not required now.	Assume not required now.		if we can't get agencies to agree to this being done in PED phase it could affect schedule and cost of Feasibility
	HH-18	10-Nov-11	NMFS recommendation to look at range of climate and sea level rise scenarios	increase alerts result in additional flows which may result in increased shoaling -	Study Risk	may affect NED - also requires coordination with contractor	High	coordination with Santee coooper will increase study duration, unknown results	Medium	SLR may have impacts unknown if it will require more releases that cannot be done with in existing contract.	Medium	High	evaluate in PED	evaluate in PED		if we can't get agencies to agree to this being done in PED phase it could affect schedule and cost of Feasibility
	HH-19	10-Nov-11	Increase in tidal alerts due to SLR or project	schedule reflects the already selected model - schedule will be impacted	Study Risk	impact to schedule	High	model has been selected, to reassess would be major scope and schedule impact	Low	previously explained model had already been selected - they weren't happy but didn't fight it	Low	Medium	move forward as planned accept risk	move forward as planned accept risk		schedule, cost, mitigation, plan selection
	HH-20	10-Nov-11	NMFS recommends agencies help select model for analysis		Study Risk											schedule, cost, plan selection

Milestone	Risk Number	Date	Scoping Choice or Event	Risk and its cause	Risk Type	Consequence	Consequence rating	Evidence for Consequence rating	Likelihood rating	Evidence for likelihood rating	Uncertainty rating	Risk Rating	Risk Management Options	Conclusion/ Recommendation	POC	Affected Study Component	
SMART milestone or IPR (for summary sheet only)	id number	Date entry was last updated	This is the scoping choice (task, decision, problem, question, issue) or event (action, hazard or opportunity) that is to be managed.	Briefly identify the risk. Considering the entry in column B, what can go wrong as a result of the scoping choice or event and how can it happen?	Select: Study Risk (Analytical error, study delays, study cost increase, poor planning decision), Implementation Risk (schedule and cost of implementation, redesign), or Outcome Risk (hazard risk and project performance risk)	Describe the consequence of the column E risk. If things do "go wrong" in the way described what is the specific consequence for the study or project outcomes? (List the most significant consequence first if more than one.)	If the most significant consequence in column G occurs what is its potential magnitude?	Enter specific evidence used to support the consequence rating in column H. If relying on an event from a previous study, list study and date.	What is the likelihood that the most significant consequence in column G will occur?	Enter specific evidence used to support the likelihood rating in column J. If relying on an event from a previous study, list study and date.	How great is the uncertainty about either the consequence or likelihood of the risk identified in column E?	Qualitative risk rating from lookup table.	Enter options for reducing the risk and estimate time/cost impacts associated with the management option.	Identify any preferred recommendation for managing the risk. Tolerating the risk is the default option.	Name(s) of person(s) assessing the task and responsible for task	What other analyses of the study are affected by this risk? For example, what other analyses use outputs from the scoping choice as their input.	
GEOTECHNICAL																	
Pre-reshape	GEO-01	12-Jul-12	Assume in schedule that groundwater modeling is not required to determine impact to groundwater intakes for water supply, because most of water supply in harbor area comes from surface water. Use existing data to evaluate impacts of deepening to groundwater use.	Determine later on in the study that groundwater model is required.	Study Risk	Major impact to water supply to those who use groundwater if groundwater is affected by deepening.	Medium	Assume in schedule that groundwater modeling is not required to determine impact to groundwater intakes for water supply, because most of water supply in harbor area comes from surface water. Use existing data to evaluate impacts of deepening to groundwater use.	Low	Bottom of River is not penetrated with proposed new project depths, thereby not impacting intakes in water supply wells. Also, predominant water supply is from Surface Water Sources	Low	Low	1)Perform detailed analysis of USGS Water Supply Reports 2)Perform groundwater modeling	1)Perform analysis but no modeling		EIS	
Pre-reshape	GEO-02	12-Jul-12	Cost estimate for deepening outside existing channel depends on material type. Ultimately, type and strength of material (i.e., soft rock, hard rock, sediment, etc.) will assist in determination of removal method.	Limited information concerning nature of offshore (seaward of existing channel entrance) material to be removed when deepening. No rock strength data for the entrance channel extension exists.	Study Risk	Quantity and Competency of rock overestimated. Cost Estimates are high.	High	No subsurface information in 3-mile extension	High	Currently no subsurface information in 3-mile extension.	Medium	High	1)Use geophysical information in 3 mile extension 2)Wash probes if rock identified in geophysical 3)Block borings and strength testing if presence of rock is potentially significant	Sub-bottom profiling, and follow up with wash probes and coring testing if needed.		Cost Estimating	
	HH-21	10-Nov-11	Appropriate level of effort required to determine additional depth required in entrance channel due to vertical ship motion	Failure to determine appropriate additional depth needed in entrance channel due to vertical ship motion during feasibility affects EFDC modeling (redo), sediment sampling (insufficient depth), screening cost estimates (too low), and many other activities.	Study Risk	Under estimating vertical motion in the entrance channel could result in sediment samples that are too shallow, costs that are too low, and modeled alternatives with insufficient depth.	High	Appropriate level of effort required to determine additional depth required in entrance channel due to vertical ship motion	Medium	could not find any other districts who had done this on recent deepening studies	Medium	High	1) Perform study of vertical ship motion 2) Perform empirical calculations available in literature 3) Assume 2-ft additional like current conditions 4) Examine actual underkeel clearance for vessels transiting in entrance channel	Assume 2-ft additional depth and verify with empirical calculations and actual practice regarding underkeel clearance		0-Jan-00	
	HH-22	12-Jul-12	Confirmation of modified WQ EFDC model with 2004 TMDL model	If new model cannot confirm TMDL calibration, then recalibration is required and coordination with EPA is required	Study Risk	more time required - schedule impact	High	coordination and rescope of contract will lengthen study time and cost	Medium	discussions did not seem to think we would need to recalibrate	Medium	High	extend schedule and rescope contract to assume recalibration is necessary	necessary		impact analysis,	
NAVIGATION																	
	NAV-01	28-Jun-12	Material management and the capacity of the upland Disposal Area	DMMA is maintained on a cyclic basis which includes drying dredged material for use in dike raising. The current cyclical process adequately contains the current maintenance material dredged from the Upper Harbor reaches with several years between diking events. Rapid addition of new work material volumes an order of magnitude greater than normal maintenance volumes will consume available capacity in the disposal area. Additional loading of new work material may compromise the structural integrity of the existing dikes. New work material will require minimum of 1 year drying time for use in raising dikes to restore capacity using standard practices.	Outcome Risk	Primary consequence is exhaustion of available capacity, through consumption or dike failure, for accepting maintenance material dredged following deepening. Without adequate capacity maintenance material from the Upper Harbor reaches would most likely be placed in the ODMDS. All sediments require sediment testing before EPA approves the placement of the material into the ODMDS. This represents an increase in O&M cost due to longer haul distances, an increase in study cost to effect testing, and a significant testing period to determine material suitability, the outcome of which is uncertain.	High	Records of existing practice and associated cost. Records of previous dike failure due to rapid loading of unconsolidated foundation, deterioration of dikes due to seepage caused by high differential head between placement cells and associated repair costs.	Medium	Knowledge of available capacity in the disposal area vs. quantity of material required for disposal. Knowledge of existing practice with regard to diking cycles. Knowledge of typical drying times for dredged material resulting in material suitable for dike improvement.	Medium	High	Perform adequate geotechnical investigation and analysis to ensure structural integrity of dikes prior to loading. Reinforce existing dikes and foundations. Identify alternative locations for disposal of new work material, including beneficial use alternatives. Material management: The future capacity needs to be calculated. DMMA needs to be evaluated based on capacity and schedule for placement of O&M and New work material. The cyclic schedule of diking and diking needs to be evaluated (and possibly accelerated) for additional capacity needs. Need to complete the modeling for future shoaling post deepening to adequately predict future O&M dredge material quantities. Need to test the sediments for chemicals and toxicity.	Avoid placing unnecessary material in DMMA instead finding beneficial use or taking to alternative location. Perform adequate geotechnical investigation and analysis to ensure structural integrity of dikes. Evaluate DMMA based on capacity and schedule, test the material for chemicals and toxicity, and sediment fate modeling.		Dike failure would prohibit the placement of dredged material in a CDF. Costs: higher costs because higher dikes or higher costs because all material is placed in ODMDS (long distance for dredge); O&M schedule impacts: possible acceleration of diking/dredging.	
	NAV-02	3-Jul-12	Availability of dredge equipment to meet construction schedule.	The distribution of dredges along the east coast adequately handles the current maintenance dredging needs. Due to the volume of material to be removed and sponsor preference to complete construction as fast as possible to complete for new vessel traffic, multiple dredges are anticipated to do the work. A short term increase in dredge demand without a corresponding increase in dredge supply will result in potential that sufficient dredge plant is not available to meet construction schedule.	Implementation Risk	The lack of sufficient dredge plant will result in construction delays and/or higher construction cost.	Medium	Mobilization and demobilization costs will increase based on how far the dredging equipment has to travel to construction site. Unit measure costs may increase due to dredge supply constraints.	Medium	Dredging records documenting typical dredge fleet serving the region. Existing environmental windows constraining dredges.	Medium	Medium	Evaluation of the challenges that will be faced in order to attract bidders to do the project and the associated costs.	Market research.		Costs and economics would be affected.	
	NAV-03	3-Jul-12	Availability of funds necessary to meet construction schedule.	Delays to schedule due to insufficient or non-available construction funds.	Study Risk	If funding is not available the construction schedule will be delayed until funding is available.	Medium	This is a legal requirement.	High	Congress has not passed a budget prior to the start of the FY in at least 3 years. FY 2012 started with continuing resolutions and work packages.	Low	High	Funding should be appropriated in order to meet the construction schedule.	Funding should be appropriated in order to meet the construction schedule.		Costs would be affected.	
	NAV-04	3-Jul-12	Cultural resources identified during construction	If cultural resources are encountered during dredging construction would be delayed.	Study Risk	Delay in construction.	Medium	Cultural resource agencies require an investigation and subsequent protection of cultural resources.	Medium	Cultural resources have been documented. New work dredging in the existing project footprint will likely not encounter cultural resources, as present elevations are below significant historical timeline. However, New work in the widening section may encounter cultural resources as the historical horizon has not yet been reached there.	Medium	Medium	Perform an evaluation of the cultural resources within the construction limits	Focus cultural resources investigations in the widening section.		Environmental certification would be affected.	
	NAV-05	3-Jul-12	New work material composition differs from assumptions	Based on the differing channel conditions, ie narrow channel widths, hard materials, etc, multiple dredges will be required in order to complete the work. The variety of conditions found within each reach requires a variety of different types of dredging equipment. The uncertainty in material that will be encountered will increase the risk.	Study Risk	The type of dredged will not be known until construction if a geotechnical investigation is not performed to identify material.	Medium	During the last deepening the dredge positioned in the entrance channel encountered rock. A law suit was brought against the USACE in order for the dredging contractor to recover losses.	Medium		0-Jan-00	Medium	Medium	Perform geotechnical analysis to identify the type of material that will be encountered by the dredge.	Perform geotechnical investigation where no information exists, rely on existing information to the extent possible.		Construction cost and schedule. Possibly environmental permitting if blasting determined to be required.
	NAV-06	3-Jul-12	Survey maintenance equipment malfunction	If the district survey assets vulnerable to mechanical/system failure. Currently only 1 vessel capable of offshore survey (EVANS) required to perform surveys in the entrance channel. USACE must rely on an alternative survey asset to measure construction quantities.	Study Risk	Reliance on non-USACE ASSET to determine payment quantities for dredging.	Medium	Record of past mechanical issues and operational experience relating to survey asset scheduling.	Low	Record of past mechanical issues and operational experience relating to survey asset scheduling.	Low	Low	Low	Rely on contractor survey asset if available, standby contract for additional survey capability, delay construction.	Rely on contractor survey asset if available.		Construction cost and schedule.
	NAV-07	3-Jul-12	Weather impacts during construction.	Hopper dredges typically dredge the entrance channel and respond quickly to inclement weather. If rock is encountered in the new work material, a large cutterhead dredge must be employed, reducing response time and thus increasing weather delays. The result will be increased cost due to non-productive dredge time. Additional volume of material to be dredged will increase cost due to presence of material, but will also slow production of new work dredging. Pre and post storm channel condition surveys represent a competing demand on the survey resource when before and after dredge surveys are required.	Implementation Risk		Medium	Lost work due to inclement weather documented in past consolidated reports. Historical hurricane landfall statistics available through NOAA.	Medium	hurricane prone area therefore the threat of a tropical storm or hurricane exists; also prone to Nor'easter storm. Consolidated reports document days lost to adverse weather. Construction of the deepening is years in the future but will still have a severe weather threat as a risk.	Medium	Medium	Tolerate.				
PLAN FORMULATION																	
	PLN-02	0	Increased Maintenance Costs	Enlarging/deepening channel may increase sedimentation as velocities change.	Outcome Risk	Increased maintenance dredging costs	Medium	1996 project modeled a significant increase in sedimentation in the harbor-post project	Medium	Previous deepening projects have resulted in more sediment deposition.	Medium	Medium	1996 project added contraction dikes to reduce sedimentation	Ensure accurate modeling		DMMP, cost engineering	
	PLN-03	0	Policy changes	Changes in Principals and Guidelines	Study Risk	Policy changes could alter, delay, or halt project	Medium	Within a multi-year project, there is a likelihood that some policy aspect may be altered	Medium	Policy changes have already taken place with the introduction of Smart Planning	Medium	Medium	Adapt project to new Planning paradigm	Better coordination with SAD/PHQ		All tasks	
	PLN-04	0	Agency Technical Review	ATR finds significant flaws in technical assumptions. Or delays in ATR Review cause delays in project schedule.	Study Risk	Time/costs delay as issues arising from ATR are addressed.	Medium	Complicated projects have the potential to extend ATR time.	Medium	Past projects that involved ATR Review	Medium	Medium	Constant coordination with ATR team.	Constant review and backchecking on all aspects of project to ensure technical and policy competence.		All tasks	
	PLN-05	0	Independent External Peer Review	IEPR finds significant flaws in technical assumptions. Or delays in IEPR Review cause delays in project schedule.	Study Risk	Time/costs delay as issues arising from ATR are addressed.	Medium	Complicated projects have the potential to extend IEPR review time.	Medium	Past projects that involved ATR Review	Medium	Medium	Constant coordination with IEPR team.	Constant review and backchecking on all aspects of project to ensure technical and policy competence.		All tasks	
	PLN-06	0	In Progress Review	IEPR finds significant flaws in technical and policy assumptions.	Study Risk	Time/costs delay as issues arising from IEPR are addressed.	Medium	Complicated projects have the potential to extend IEPR review time.	Medium	Past projects that involved IEPR Review	Medium	Medium	Constant coordination with IEPR team.	Constant review and backchecking on all aspects of project to ensure technical and policy competence.		All tasks	
Charette	PLN-08	21-Jun-12	Preliminary Benefit and Cost Analysis (Initial Screening of Alternatives using Net Benefit Criteria)	Cost too high or not available & benefits too low	Study Risk	no initial NED plan may exist... no net benefits	Medium	Preliminary Benefits and Costs estimates/assumptions have uncertainty due to limited benefit and cost data	High	Preliminary Benefits and Costs estimates/assumptions have uncertainty due to limited benefit and cost data	High	High	obtain additional benefits for Generation 3 container ships and more detailed costs	Tolerate		screening of alternatives & reevaluation of alts	
Charette	PLN-09	9-Jul-12	Eliminate Alternative/Segment 3 from navigation study	Navigation study fails to identify true NED Plan and does not satisfy completeness criteria of Economic and Environmental Principles	Study Risk	Existing Container Ship Operators and bulk carriers desire for additional depth ignored, which could result in shipping companies moving to other ports	High	Container ship and bulk carriers have provided letters of support for deepening Alternative/Segment 3	Medium	Container ship and bulk carriers typically refer to other ports with deeper harbors in negotiations with Sponsor for terminal space	High	High	Continue to include Alternative/Segment 3 through evaluation and completion of Draft Report	Obtain Sponsor's recommendation		screening of alternatives & reevaluation of alts	
	PLN-10	12/20/2012	Select maximum entrance channel cross-section for consideration during feasibility.	P&T and Vertical Team have selected a max cross-section shape equivalent to the existing, but with deeper depths (no widening). Since ship simulation will be done in PED, this could result in changes to the recommended project after the Chief's Report is approved.	Study Risk	Changes to the recommended plan during PED could delay construction by changing the total project cost and requiring updates to 902 and potentially the report.	High	Pushing ship simulation to PED has made certain assumptions necessary during feasibility. In this case, preliminary cost estimates show that a widened entrance channel (1000' bottom width) increases total project cost by \$20M+. Given the circumstances of how the existing entrance channel width was selected and the lack of significant problems with the existing condition, deepening only of the entrance channel is recommended for feasibility.	Low	Ship simulation during 1996 feasibility study process recommended an 800-ft wide channel with simple side slopes. Additional conferences with the Pilots resulted in an agreement to maintain the 1000-ft wide section at 42-ft MLLW and a deeper center section with 800-ft width at 47-ft MLLW. Likelihood of upcoming ship simulation suggesting more than the existing cross-section is necessary is low.	Medium	Medium	Use maximum feasibility entrance channel cross-section equal to existing section plus deepening	Assume maximum widening and live with the higher cost estimate until PED		screening of alternatives cost estimates environmental assessment of hard-bottom resources expected to be impacted	
REAL ESTATE																	
	RE-01	9-Jul-12	Impacts, and consequently mitigation requirements are currently unknown.	Since mitigation requirements are unknown there is currently no cost projected for acquisition of mitigation lands. Land costs and needed acreage could be much higher than might be expected.	Study Risk	If mitigation efforts are required, there could be increased study/project costs.	Medium	No Data/based on professional judgment	Medium	Past experience and projects	Medium	Medium	More data is required. Mitigation determination will be done using EFDC modeling.	Identify the lands required for mitigation and prepare ROM cost for inclusion in total project cost.		Inaccurate mitigation requirements would impact cost engineering and cost benefit ration in economic determination.	
ECONOMICS																	

Milestone	Risk Number	Date	Scoping Choice or Event	Risk and its cause	Risk Type	Consequence	Consequence rating	Evidence for Consequence rating	Likelihood rating	Evidence for likelihood rating	Uncertainty rating	Risk Rating	Risk Management Options	Conclusion/ Recommendation	POC	Affected Study Component	
SMART milestone or IPR (for summary sheet only)	Id number	Date entry was last updated	This is the scoping choice (task, decision, problem, question, issue) or event (action, hazard or opportunity) that is to be managed.	Briefly identify the risk. Considering the entry in column D, what can go wrong as a result of the scoping choice or event and how can it happen?	Select: Study Risk (Analytical error, study delays, study cost increase, poor planning decision), Implementation Risk (schedule and cost of implementation, redesign), or Outcome Risk (hazard risk and project performance risk)	Describe the consequence of the column E risk. If things do "go wrong" in the way described what is the specific consequence for the study or project outcomes? (List the most significant consequence first if more than one.)	If the most significant consequence in column G occurs what is its potential magnitude?	Enter specific evidence used to support the consequence rating in column H. If relying on an event from a previous study, list study and date.	What is the likelihood that the most significant consequence in column G will occur?	Enter specific evidence used to support the likelihood rating in column J. If relying on an event from a previous study, list study and date.	How great is the uncertainty about either the consequence or likelihood of the risk identified in column E?	Qualitative risk rating from lookup table.	Enter options for reducing the risk and estimate time/cost impacts associated with the management option.	Identify any preferred recommendation for managing the risk. Tolerating the risk is the default option.	Name(s) of person(s) assessing the task and responsible for task	What other analyses of the study are affected by this risk? For example, what other analyses use outputs from the scoping choice as their input.	
GEOTECHNICAL																	
Pre-reshape	GEO-01	12-Jul-12	Assume in schedule that groundwater modeling is not required to determine impact to groundwater intakes for water supply, because most of water supply in harbor area comes from surface water. Use existing data to evaluate impacts of deepening to groundwater use.	Determine later on in the study that groundwater model is required.	Study Risk	Major impact to water supply to those who use groundwater if groundwater is affected by deepening.	Medium	Assume in schedule that groundwater modeling is not required to determine impact to groundwater intakes for water supply, because most of water supply in harbor area comes from surface water. Use existing data to evaluate impacts of deepening to groundwater use.	Low	Bottom of River is not penetrated with proposed new project depths, thereby not impacting intakes in water supply wells. Also, predominant water supply is from Surface Water Sources	Low	Low	(1)Perform detailed analysis of USGS Water Supply Reports (2)Perform groundwater modeling	(1)Perform analysis but no modeling		EIS	
Pre-reshape	GEO-02	12-Jul-12	Cost estimate for deepening outside existing channel depends on material type. Ultimately, type and strength of material (i.e., soft rock, hard rock, sediment, etc.) will assist in determination of removal method.	Limited information concerning nature of offshore (seaward of existing channel entrance) material to be removed when deepening. No rock strength data for the entrance channel extension exists.	Study Risk	Quantity and Competency of rock overestimated. Cost Estimates are high.	High	No subsurface information in 3-mile extension	High	Currently no subsurface information in 3-mile extension.	Medium	High	(1)Use geophysical information in 3 mile extension (2)Wash probes if rock identified in geophysical (3)Rock borings and strength testing if presence of rock is potentially significant	Sub-bottom profiling, and follow up with wash probes and coring testing if needed.		Cost Estimating	
	ECON-01		Using the TCSM to calculate draft benefits	TCSM and HarborSym will differ in project benefits calculated	Study Risk	Benefits claimed will differ from DP1 to DP2	Low	Expect the Economic benefit curve to go up/down but not shift to different NED plan	High	HarborSym model uses similar methodology to the TCSM	Low	Medium	Use HarborSym deepening model	tolerate risk		Economics	
	ECON-02		Commodity Forecast - using the Global Insight commodity forecast and 0% growth to select TSP	TSP will be selected without additional sensitivity analysis	Study Risk	could select too deep or shallow plan for NED, over estimate cost, not obtain benefits claimed	Medium	Potential to over/under estimate project benefits	Medium	forecasting could be wrong, other ports and trade uncertain, same as column F	Medium	Medium	Additional commodity growth rates could be run to minimize risk	tolerate risk		Econ, Eng, Envir,	
	ECON-03		Design Vessel/Largest economic benefiting vessels to call over the next 25 years	could select wrong vessel because of lack of knowledge	Study Risk	could select too deep or shallow plan for NED, over estimate cost, not obtain benefits claimed	High	Literature and evidence is not clear, major changes in shipping industry, other ports and other trade is uncertain	High	forecasting could be wrong, other ports and trade uncertain, same as column F	High	High	Run Both the Gen 2 and Gen 3 scenarios, decide when more is known on impacts, revisit during Decision Point 2	Run Both the Gen 2 and Gen 3 scenarios, decide when more is known on impacts, revisit during Decision Point 3		Econ, Eng, Envir,	
	ECON-04		Segment 4 - triggers will occur for relocation of current automobile yard back to Container yard	If triggers do not occur, benefits may be delayed or not occur at all	Study Risk	TSP could include Segment 4	High	Could select a TSP that includes an area not converted to a container yard	High	Not clear at this time when the automobile yard will be converted	High	High	Include Segment 4 in the TSP analysis, revisit during time period between DP1 and DP2	Include Segment 4 in the TSP analysis, revisit during time period between DP1 and DP2		Econ, Eng, Envir,	
	ECON-05		One fleet/commodity forecast throughout the study analysis.	Changes in the World Economy could impact the anticipated amount of cargo calling the East Coast, thereby Charleston Harbor and the Vessel Fleet servicing that cargo.	Study Risk	forecast may not adequately characterize uncertainty due to changing economic climate. Previous studies have required updates to forecasts throughout the analysis. Time and cost for forecasts are 3 to 4 months with approximately 125K	Medium	With major changes to the World Economy, both the commodity and vessel fleet forecasts could differ greatly with an updated forecast, thereby, altering the anticipated benefits of the project. However, the economy could	Medium	This may or may not become an issue. Anticipated impacts could range from high to low depending on the future economy. Therefore, medium was chosen.	Medium	Medium	(1)Obtain one estimate based on forecast (2)Do sensitivity analysis (3)Do probabilistic risk assessment (4)Obtain new forecasts before DP2	Obtain only one set of forecasts during the study and address any short comings with sensitivity analysis		Econ	
	ECON-06		HarborSym deepening model has been certified. The HarborSym loading tool has not been approved.	A significant delay in the modeling approval could have an impact on the schedule.	Study Risk	Lack of certification or bugs in model will cause schedule delay	Medium	A scheduling impact could cause significant concern if that impact causes Economics to become the critical path	Low	Currently, the loading tool is being evaluated for certification.	Low	Low	TCSM is currently being used to develop the Tentatively Selected Plan.	tolerate risk		Econ	
	ECON-07		Vertical team acceptance of Commodity Growth rate projections & future fleet forecast	Concurrence from entire vertical team on commodity growth rate projections and future fleet forecast needs to be obtained at DP1	Study Risk	If future commodity or fleet projections are changed after modeling effort is complete, large schedule delays will occur because portion of modeling will need to be redone	High	Without vertical chain acceptance, additional model runs causing additional time/costs would be required	High	Anticipated impacts could range from high to low depending on the future economy. Therefore, medium was chosen.	High	High	(1)Obtain concurrence from Vertical Team on growth rate at DP1 and make no updates (2)Inform sponsor of issue and risk if growth rate changes are required/requested (3)Sensitivity Analysis	Push for vertical chain acceptance during DP1		Econ	
	ECON-08		IWR vessel operating costs have not been updated to include Sailing Draft or slow steaming.	VOC are anticipated to change when updated by IWR. With the inclusion of slow steaming, it is possible there will be a decrease in the operating costs.	Study Risk	This may affect formulation. TCSM to tentatively selected plan is using existing VOC provided by IWR	Medium	IWR has stated that new VOC will include slow steaming	High	IWR has stated that new VOC will include slow steaming	High	High	Inform sponsor of issue and risk to anticipate changes to VOC. Continue with current VOC until new operating costs become available.				Econ
	ECON-09		Sensitivity Runs Required are not clearly defined.	Number of, and assumptions for sensitivity runs required by HQ/higher-level review.	Study Risk	Schedule delays could occur if reviewers require more runs that require new or modified fleet and/or commodity forecasts once modeling effort is complete and report is in review phase. Current schedule allows for 2 sensitivity runs. Additional runs would require time and cost. Potential time for each model run - 3 to 6 weeks depending on how complex the change becomes. Costs range between 12 and 25K per run.	Medium	Official buy off has not been accepted, but vertical chain has been made aware.	Low	By choosing appropriate sensitivity runs, with full support from vertical team, chances that new runs will be required are low.	Medium	Low	(1)Begin sensitivity analysis planning as soon as ATR Team is assembled and bring together DONPCX, ATR, OWPR, IWR for discussion. Record decision(s) in Decision Log. (2)Wait on formulating sensitivity analysis options until they are needed. (3)Running 0% commodity growth was suggested by OWPR at 3x3x3 charette.	Push for vertical chain acceptance between DP1 and DP2		Econ	
COST																	
	CST-01	9-Jul-12	Unit cost for dredging could be in error due to the assumption on the type of dredge to be used in each reach.	If the type of dredge is different from the assumption, the unit cost could change significantly.	Study Risk	Cost estimate could be in error resulting in the selection of the wrong plan.	High	If incorrect plan is selected, time and schedule will suffer once the data gathering starts for the wrong plan.	Low	An educated assumption was used to determine the type of dredge to be used.	Low	Medium	Performing geotechnical test to identify the characteristics of material which determines the type of dredge.	Perform testing.		The overall cost of the project could be impacted and therefore the overall approval could be affected by changing the B/C ratio.	
	CST-02	9-Jul-12	Type of material and dredgability of material is unknown in many areas.	Historical data does not go to the depths that this project is extended to dredge.	Study Risk	The amount of hard material is unknown without doing some tests and analysis at all depth alternatives. The dredging cost could increase dramatically if more hard material is encountered than what is assumed.	High	The cost of dredging rock is 3 to 4 times the cost of granular material.	High	Rock material has been encountered previously. Deeper dredging will encounter more rock. The amount and strength of rock needs to be determined.	Low	High	Performing geotechnical test to identify the characteristics of material which determines the cost of dredging.	Perform testing.		The overall cost of the project could be impacted and therefore the overall approval could be affected by changing the B/C ratio.	
	CST-03	9-Jul-12	The rock material expected is assumed to be dredgable with a rock cutter head dredge.	Historical data does not go to the depths that this project is extended to dredge. In addition, no strength data is known for the rock.	Implementation Risk	Blasting may be required to remove rock material if the strength is beyond the effective use of a rock cutter dredge.	High	The additional cost of blasting with the associated environmental control/mitigation would elevate the cost of the project significantly.	Medium	Rock material has been encountered previously. Deeper dredging will encounter more rock. The amount and strength of rock needs to be determined.	Medium	High	Performing geotechnical test to identify the characteristics of material which determines the cost of dredging.	Perform testing.		The overall cost of the project could be impacted and therefore the overall approval could be affected by changing the B/C ratio.	
	CST-04	9-Jul-12	Using a lower level of design detail for cost estimates prior to the tentatively selected plan(dredging and/or mitigation)	Initial cost estimates for alternatives likely will not be accurate, but they may be consistent across the suite of alternatives (i.e., a discrete widening measure carried through multiple alternatives will be consistent)	Study Risk	Cost estimate could be in error resulting in the selection of the wrong plan.	Medium	With a low level of design especially for mitigation, the cost estimates could be significantly lower than the actual cost.	Medium	Assumptions are being made with the best knowledge available.	Medium	Medium	Perform modeling to determine environmental impacts for mitigation.	Perform modeling.		The overall cost of the project could be impacted and therefore the overall approval could be affected by changing the B/C ratio.	
	CST-05	9-Jul-12	Assumption of no contaminated dredge material could be in error.	For initial cost estimates, the assumption that no contaminated dredge would need to be handled for disposal.	Study Risk	If contaminated materials are discovered, the cost estimates would be significantly low.	High	Disposal cost and dredging cost would increase if contaminated materials are required to be dredged and handled.	Medium	Assumptions are being made with the best knowledge available.	Medium	High	Perform sampling and testing of materials in areas to be dredged.	Perform testing.		The overall cost of the project could be impacted and therefore the overall approval could be affected by changing the B/C ratio.	
	CST-06	9-Jul-12	Inconsistencies introduced through the use of multiple cost estimators.	Individual approaches of different estimators may cause inconsistency in the preparation of cost estimates.	Study Risk	Cost estimate could be in error resulting in the selection of the wrong plan.	Low	Individual estimators use different assumptions to prepare estimates.	Low	Experienced estimators are being used to prepare cost estimates.	Low	Low	Use of cost estimators with experience in producing dredging estimates.	Use of small number of estimators with levels of review.		None	
	CST-07	9-Jul-12	Limited number of experienced cost estimators.	The estimators within SAD that have experience with deep draft navigation dredging estimates are very limited and most are getting close to retirement eligibility. In addition, cost engineers may be reassigned. Finally, with the declining number of estimators, the workload on the remaining estimators increases.	Study Risk	Meeting deadlines due to limited cost estimators.	High	Availability of experienced estimators is a systemic problem.	Medium	Current estimator is experienced, but workload is still an issue.	Low	High	Offer incentives to ensure cost engineering has adequate resources.	Offer incentives to ensure cost engineering has adequate resources.		Schedule of study could be adversely affected.	
	CST-08	9-Jul-12	Unknown extent of mitigation required for each alternative.	alternative is not known, this can cause uncertainty in the cost estimates generated from the fact that one assumption would not apply to all alternatives and therefore would increase the need for defining mitigation requirements.	Study Risk	Cost estimate could be in error resulting in the selection of the wrong plan.	High	Mitigation costs could be a significant driver in the overall cost of the project.	High	Assumptions are being made with the best knowledge available.	Low	High	Perform modeling to determine environmental impacts for mitigation.	Perform modeling.		The overall cost of the project could be impacted and therefore the overall approval could be affected by changing the B/C ratio.	
	CST-09	9-Jul-12	Potential Civil War munitions in dredge material.	The potential exists for encountering Civil War era explosive munitions during dredging.	Study Risk	Costs for locating and removing munitions is not included in current estimates.	High	Significant damage to dredging equipment and interruption in operations which would increase production costs.	Low	Assumptions are being made with the best knowledge available.	Medium	Medium	Perform magnetometer studies to locate potential munitions.	Perform studies.		Schedule of study could be adversely affected.	
	CST-10	9-Jul-12	Beneficial use of dredge material (+/-).	The implementation of beneficial use of dredged material can add cost to the construction phase of the project.	Study Risk	Beneficial use of dredged material is not currently contained in the cost estimates.	Medium	Beneficial use can increase the construction cost for the project. However, depending on the use, environmental mitigation costs can be lowered.	Low	The PDT will weigh the impacts vs. the benefits and select the best possible beneficial uses of dredged material.	Low	Low	Analyze the cost vs benefits of potential uses.	Perform analysis.		This analysis can be performed in any phase of the project from feasibility to FED.	
	CST-11	9-Jul-12	Volatility in fuel costs.	The rapid fluctuations in marine fuel costs have the potential to significantly affect the cost of dredging operations.	Study Risk	The overall cost of the TSP could be significantly higher than anticipated.	High	The additional cost of higher than expected fuel would elevate the cost of the project significantly.	Medium	Assumptions are being made with the best knowledge and forecasts of fuel costs available.	Low	High	Continually update the fuel costs to maintain a current cost estimate.	Update costs continually.		The overall cost of the project could be impacted and therefore the overall approval could be affected by changing the B/C ratio.	
	CST-12	9-Jul-12	Air emissions controls for dredging operations.	The implementation of air emissions restrictions could impact the cost of dredging operations.	Study Risk	The overall cost of the TSP could be significantly higher than anticipated.	High	The additional cost of restricting air emissions would elevate the cost of the project significantly.	Low	Air emissions have not had an adverse impact during dredging operations in the past.	Low	Medium	Coordinate with regulatory agencies to determine the possible impacts.	Environmental coordination.		The overall cost of the project could be impacted and therefore the overall approval could be adversely affected causing a potential 902 limit adjustment.	
	CST-13	9-Jul-12	Availability of dredges at time of construction.	The availability of suitable dredges at the time of construction could impact the competition and ultimately the cost of dredging operations.	Study Risk	The overall cost of the TSP could be significantly higher than anticipated.	High	Without adequate competition, dredge contractors can increase the dredging cost of the project.	Medium	Large dredging contractors have been attempting to monopolize the dredging operations.	Low	High	Monitor the dredging contractors to ensure suitable competition exists.	Monitor contractors.		The overall cost of the project could be impacted and therefore the overall approval could be affected by changing the B/C ratio.	
	CST-14	9-Jul-12	Disposal area capacity.	The capacity of the disposal area is limited. Increasing the capacity to handle additional material would increase the cost of the project.	Study Risk	The overall cost of the TSP could be significantly higher than anticipated.	High	Increasing the capacity of the DA would increase the overall project cost.	Medium	Current surveys show the capacity of the DA is limited and would need to be increased if the deeper alternatives are selected as the TSP.	Low	High	Analyze the required increase in capacity based on the TSP.	Analyze the impact.		The overall cost of the project could be impacted and therefore the overall approval could be affected by changing the B/C ratio.	
	CST-15	9-Jul-12	Disposal area stability.	The stability of the containment dikes in the disposal area is unknown at this time. Reinforcing the dikes could significantly impact the cost.	Study Risk	The overall cost of the TSP could be significantly higher than anticipated.	High	The additional cost of reinforcing the containment dikes would elevate the cost of the project significantly.	Medium	There have been significant cracks in the containment dikes previously and increasing the height and load on the dikes will increase the probability of failure.	Low	High	Analyze the required increase in capacity and the resulting reinforcement of the containment dikes based on the TSP.	Analyze the impact.		The overall cost of the project could be impacted and therefore the overall approval could be affected by changing the B/C ratio.	
	CST-16	9-Jul-12	Multiple simultaneous dredging operations.	If multiple dredges are working simultaneously, the efficiency of the operations may be decreased due to congestion at disposal areas.	Study Risk	The overall cost of the TSP could be higher than anticipated.	Medium	Inefficiencies could increase the cost and schedule during construction.	Low	Coordination by dredging contractors can be used to alleviate this potential problem.	Low	Low	Require a dredging coordination plan.	Require coordination plan.		No significant impact expected.	
	CST-17	9-Jul-12	Volatility in steel pipeline costs.	If costs for steel pipeline increase, the cost of operations using pipeline dredges would increase.	Study Risk	The overall cost of the TSP could be higher than anticipated.	Medium	Higher pipeline costs could increase the cost of the project.	Low	Pipeline prices have stabilized in the past few years.	Low	Low	Monitor the cost of pipeline and adjust estimates accordingly.	Update costs continually.		No significant impact expected.	

Milestone	Risk Number	Date	Scoping Choice or Event	Risk and its cause	Risk Type	Consequence	Consequence rating	Evidence for Consequence rating	Likelihood rating	Evidence for likelihood rating	Uncertainty rating	Risk Rating	Risk Management Options	Conclusion/ Recommendation	POC	Affected Study Component
SMART milestone or IPR (for summary sheet only)	Id number	Date entry was last updated	This is the scoping choice (task, decision, problem, question, issue) or event (action, hazard or opportunity) that is to be managed.	Briefly identify the risk. Considering the entry in column D, what can go wrong as a result of the scoping choice or event and how can it happen?	Select: Study Risk (Analytical error, study delays, study cost increase, poor planning decision), Implementation Risk (schedule and cost of implementation, redesign), or Outcome Risk (hazard risk and project performance risk)	Describe the consequence of the column E risk. If things do "go wrong" in the way described what is the specific consequence for the study or project outcomes? (List the most significant consequence first if more than one.)	If the most significant consequence in column G occurs what is its potential magnitude?	Enter specific evidence used to support the consequence rating in column H. If relying on an event from a previous study, list study and date.	What is the likelihood that the most significant consequence in column G will occur?	Enter specific evidence used to support the likelihood rating in column J. If relying on an event from a previous study, list study and date.	How great is the uncertainty about either the consequence or likelihood of the risk identified in column E?	Qualitative risk rating from lookup table.	Enter options for reducing the risk and estimate time/cost impacts associated with the management option.	Identify any preferred recommendation for managing the risk. Tolerating the risk is the default option.	Name(s) of person(s) assessing the task and responsible for task	What other analyses of the study are affected by this risk? For example, what other analyses use outputs from the scoping choice as their input.
GEOTECHNICAL																
Pre-reshape	GEO-01	12-Jul-12	Assume in schedule that groundwater modeling is not required to determine impact to groundwater intakes for water supply, because most of water supply in harbor area comes from surface water. Use existing data to evaluate impacts of deepening to groundwater use.	Determine later on in the study that groundwater model is required.	Study Risk	Major impact to water supply to those who use groundwater if groundwater is affected by deepening.	Medium	Assume in schedule that groundwater modeling is not required to determine impact to groundwater intakes for water supply, because most of water supply in harbor area comes from surface water. Use existing data to evaluate impacts of deepening to groundwater use.	Low	Bottom of River is not penetrated with proposed new project depths, thereby not impacting intakes in water supply wells. Also, predominant water supply is from Surface Water Sources	Low	Low	1)Perform detailed analysis of USGS Water Supply Reports 2)Perform groundwater modeling	1)Perform analysis but no modeling		EIS
Pre-reshape	GEO-02	12-Jul-12	Cost estimate for deepening outside existing channel depends on material type. Ultimately, type and strength of material (i.e., soft rock, hard rock, sediment, etc.) will assist in determination of removal method).	Limited information concerning nature of offshore (seaward of existing channel entrance) material to be removed when deepening. No rock strength data for the entrance channel extension exists.	Study Risk	Quantity and Competency of rock overestimated. Cost Estimates are high.	High	No subsurface information in 3-mile extension	High	Currently no subsurface information in 3-mile extension.	Medium	High	1)Use geophysical information in 3 mile extension 2)Wash probes if rock identified in geophysical 3)Rock borings and strength testing if presence of rock is potentially significant	Sub-bottom profiling, and follow up with wash probes and coring testing if needed.		Cost Estimating
	CST-18	9-Jul-12	Volatility in mobilization costs.	Mobilization of dredges is a significant cost. If dredges are required to travel farther than anticipated, the mobilization costs can be higher than expected. In addition, if multiple mob/demos are required due to weather or environmental restrictions, costs will increase.	Study Risk	The overall cost of the TSP could be higher than anticipated.	High	Higher mobilization costs could increase the cost of the project.	Medium	Mobilization costs are dependent on many factors and can be affected without expectation.	Medium	High	Monitor the dredging contractors to ensure suitable dredges are within a reasonable distance.	Monitor contractors.		Construction costs for the project could be adversely affected causing a potential 902 limit adjustment.
	CST-19	9-Jul-12	Creation of expanded ODMDS.	The capacity of the current ODMDS is limited. Increasing the capacity to handle additional material would require coordination with regulatory agencies.	Study Risk	The schedule for the project could be impacted if approval to expand the ODMDS is not handled expeditiously. In addition if alternate disposal areas are required, significant cost impacts could be realized.	High	Impacts to schedule could be realized if early coordination with regulatory agencies is not pursued.	Low	Coordination is currently underway.	Low	Medium	Coordinate with regulatory agencies.	Coordinate with regulatory agencies.		No significant impact expected.
	CST-20	9-Jul-12	Changing material characteristics between time of study and construction.	Initial cost estimates assumed no contaminate material to be handled. If a significant environmental event such as an oil spill or spill of contaminated substances occurs prior to project initiation this could impact the cost of construction.	Study Risk	The overall cost of the TSP could be higher than anticipated.	High	Disposal cost and dredging cost would increase if contaminated materials are required to be dredged and handled.	Low	harbor has not had any significant spills of contaminated materials in the recent past.	Low	Medium	Monitor the harbor conditions if a contamination incident occurs.	Monitor the harbor conditions if a contamination incident occurs.		No significant impact expected.
	CST-21	9-Jul-12	Changes in volume of material between time of study and construction.	Current estimates are generated using new work quantities only. If maintenance dredging is required at the time of construction, volume of material could increase significantly.	Study Risk	The overall cost of the TSP could be higher than anticipated if volume of material increases.	High	Projecting volume of material 5 to 7 years ahead of construction can lead to significant changes in quantity and resulting cost.	Medium	Changes in volume are expected due to the length of projection for quantities. However, the quantities for new work should not vary as significantly as maintenance quantities.	Low	High	Monitor the volume of material to be removed and update costs accordingly.	Monitor the volume of material to be removed and update costs accordingly.		No significant impact expected.
	CST-22	9-Jul-12	SBA requirements.	If SBA contractors are required to be used for portions of the contract, there could be an impact to the cost.	Study Risk	The overall cost of the TSP could be higher than anticipated.	Medium	SBA contractors generally have a higher overhead cost and therefore higher overall cost than when openly competed.	Low	With the size of the projected work load, most SBA contractors are not equipped to handle the scope of work required.	Low	Low	Coordinate with contracting to determine the expected method of solicitation.	Coordinate with contracting to determine the expected method of solicitation.		No significant impact expected.
	CST-23	9-Jul-12	Number of alternatives to be evaluated.	With several depths and widening combinations possible, producing estimates for all alternatives can be a time consuming task.	Study Risk	The schedule for the study could be impacted if numerous alternatives are considered.	Medium	With limited cost engineering resources, the number of alternatives needs to be limited so as not to impact the study schedule.	Medium	Cost engineering resources are not projected to improve in the foreseeable future.	Low	Medium	Coordinate with PDT to limit the number of alternatives to consider.	Coordinate with PDT to limit the number of alternatives to consider.		No significant impact expected.