

Cost Estimate

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)
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1	6/25/2014		Scope definition affects estimation of quantities of materials, labor, equipment, non-construction costs etc.	Scope needs to be clearly defined in order for the estimate to accurately reflect all cost factors.	This can affect project cost, BCR, and production rates during construction, increasing the recommended project cost so that it may no longer be in the public interest to implement. May result in inappropriate selection of TSP.	M	M	H	M	Plan selection	Based upon experience with previous projects. Need to list specific projects that influenced choice.	Perform cost-schedule risk analysis to ensure proper contingency added to costs. Ensure scope definition for intermediate and final array of alt plans include adequate detail for respective level of estimate.	Clearly define scope of intermediate and final array of alt plans as soon as possible.	Cost-schedule risk analysis, final array design and cost analysis	Reduce risk of cost inaccuracies.	
2	6/25/2014		CSRA (Cost Schedule Risk Analysis)	Best to perform CSRA as early as possible (TSP). However, you can build the risk register throughout the project development. (i.e.: Use this risk register to feed into the CSRA later)	This could affect project life cycle cost, perhaps rendering project cost so that it may no longer be in the public interest to implement.	M	L	M	L	Contingency, awareness of risk item(s)	Abbreviated risk analyses done to develop preliminary contingency. Full CSRA will be completed at identification of TSP. This has been successful on previous projects.	Abbreviated risk analysis required initially, prior to TSP. Initiate CSRA when TSP identified.	Start early to identify risks and plan to mitigate them before reaching TSP.	CSRA tasks.	Better description of risk or possible mitigation of risk due to additional time to complete within the schedule.	
3	6/25/2014		Adopting ROM mitigation costs from sponsor	Obtaining costs from a third party could risk underestimating the costs, since you don't know the basis for their costs.Sponsor already has ROM mit costs. USACE project might be very similar to their project, and adopting their ROM mit could save time and money in feas phase.	This can affect project cost and BCR increasing the recommended project cost so that it may no longer be in the public interest to implement.	H	M	M	H	Cost comparisons for structural alts, implementation cost for non-struc alts, det of net benefits	Nearshore mitigation costs can be high dollar value per acre, based on other projects. With expected low benefits, a change in the cost could make or break an alternative.	Compare mitigation cost from sponsor to other projects. Use range of value to test sensitivity to plan selection.	Use mitigation costs with a contingency.	Mitigation plan development, cost estimating	Plan selection that is independent of mitigation cost changes.	
4	6/25/2014		Identification of borrow source(s)	Not identifying the location, not having enough core borings, and adequate quantity for the life of the project.	This can affect project cost and BCR increasing the recommended project cost so that it may no longer be in the public interest to implement.	H	M	M	H	Plan selection	Adequate geotech investigation, information and analyses are needed to ensure the borrow area(s) have sufficient sand to sustain the life of the project.	Compare distance of borrow areas from other projects to dredging cost. Develop range of costs based on possible borrow areas. Complete geotech analysis to identify borrow area(s).	Identify specific borrow source(s) as soon as possible.	Geotech investigations, cost estimating	Plan selection that is independent of the borrow area location.	

Economics

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1	6/25/2014		Assessment of shoreline armoring	Currently no existing armor and assuming no armor in future w/o project modeling.	When estimating future without project damages, armor costs (damages) can be significant. In many cases if no Federal project is implemented, homeowners or businesses will build armor at their own expense to protect their property and that can be many thousands of dollars per homeowner. In this case, Beachfx assumes no armor in the future without project condition. If lots can be permitted for armor (built before 1985 per state regulations), benefits could be underestimated in future w/o project condition.	L-M	L	M	L	HSDR benefits	Few structures (residential or commercial) were built before 1985 or are vulnerable to the 15 yr storm (per state regulatory permitting regulations), if a structure is built after 1985, it could still be permitted for armoring and might be able to get a waiver if the state regulatory model demonstrates it is vulnerable to 15 yr return period storm. Currently there is no armor in the study area.	Verify age of structures and compare to regulations. Create Vulnerability model--if it avail and if not, how might we deal with structures built after 1985, i.e. determine if they are vulnerable to a 15 yr return period storm; and why do we assume no armor in future without project condition.	Review structure inventory for buildings older than 1985. If built before 1985, then may know whether need to rerun Beachfx to acct for damages;	Economics, BeachFX	Verify fwop assumptions in BeachFX model	
2	6/25/2014		New versions/patches of BeachFx	Go backwards and re-run future w/o project condition. Model is sequential - must be recalibrated each time.	Increase of time and money on the study.	M	H	M	H	HSDR benefits, cost comparisons for structural alts, net benefits, periodic nourishment costs	Is there value added for each new model update/patch? Would it even change the selected plan?	Update model every time a new version comes along. Select a model version and stick with it.	Proposal is to restart with the newest version of Beach-FX, then continue with that same version; can evaluate effects of any updates but will not remodel with new updates. If have to re-run, model only the TSP.	Economics, BeachFX, Engineering	Less time lost for model version updates with little effect on the plan selection.	
3	6/25/2014		Screening measures	Impact on screening measures using ROM costs and future w/o project damages to screen measures.	Screen something out too early that could be a good plan or include something that might have hidden cost. Use ROM mitigation cost from County.	M	L	L	L	Screening measures	With many alternatives, the risk of screening out the best plan is unlikely.	Will use info from other projects and from county (ROM mitigation costs) project to inform analysis. Keep plans that are close to unity.	Involve Vert team in screening methodology. Write up plan; get buy in from Vert team. After analysis, have IPR to finalize buy-in.	Economics, BeachFX, plan formulation	Agreement on screening methodology.	
4	6/25/2014		Assumptions going into BeachFx	Having to re-run model numerous times if reviewer disagrees, etc.	Time and cost risk to the study	M	H	H	H	Delay in TSP	Already re-run multiple times; guidance is not clear; lack of expertise on beachfx within USACE	Vertical team review of assumptions early. Clear write up of assumptions as part of Economics appendix.	Engage ERDC as a reviewer. Do writeup of assumptions and talk it over with PCX reviewers.	Economics, BeachFX	Vertical team agreement on assumptions	
5	6/25/2014		Benefit evaluations	Big spike of damages at R113	Majority of damages are in one r-monument 1000 ft reach, at the location of a large condo building. Without the spike, we may have an unjustified project.	H	M	H	H	Plan selection	Turtle Reef resort (R113) is older slab on grade, highly vulnerable structure.	Highly likely that reviewers will zone in on spike. At minimum, include good writeup on what Turtle Reef is, if any other condos are part of those damages etc. Get help from RE. Econ will look at how many times condo is getting rebuilt; consider these structures for armoring in the model. Calibrate model to make sure it's accurate. Do a run to see what happens if take out R113 for sensitivity.	Evaluate R113 Turtle Reef resort with special interest. Test for rebuilds, armor, sensitivities if removed. Per 6-11-14 re-scoping VT mtg, if this remains true after sensitivity analyses, need IPR with VT for more discussion.	Economics, BeachFX	TSP that is not dependent on one structure or uncertain fwop conditions.	
6	6/25/2014		Recreation benefits	Doing a unit day value method (UDVM) rather than a travel cost method. The cap for being able to use UDVM the is 750,000 user events/yr, then must do travel cost method.	UDVM may not adequately estimate recreation benefits, leaving some "on the table".	L	L	L	L	Net benefits	Other studies	Coordinate with County for recreation data / studies / surveys to determine method to use. Start analyses early.	Coordinate w/County re: data availability. Start analyses early.	Economics, BeachFX	Get vertical team agreement on methodology.	
7	6/25/2014		Public access--moved to plan formulation													
8	6/25/2014		Structure Inventory will need to be updated by the time we submit a report for approval by HQ.	Impact on study schedule and cost.	H	H	L	H	H	HSDR improvements, net benefits, cost comparisons structural alts	Current guidance suggests that the structure inventory used in FRM and HSDR studies should be as up to date as possible.	Update structure inventory included in budget / schedule.	The structure inventory will be updated and this task has been input into the schedule.	Economics, BeachFX, Real Estate	Appropriate structural inventory data will be utilized for alternative evaluations to determine HSDR benefits.	

Engineering

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1	6/25/2014		Historical Volume Change Analysis	Beachfx does not require this analyses as did previous models. If we don't do it, HQ could ask for it later. (It acts as double check to reviewers.)	Time and cost increase to study.	L	M	M	L	N/A Always fill in. If there is not a decision (whether that decision is made by district, MSC, HQ, or ASA) that is related to the risk, why are we listing this risk?	Historically this has been done, but new Beachfx model does not use historic volume change (Uses MHW line).	Complete historic volume change analysis.	Historic volume change analysis will be completed if time and resources allow. Ask VT if required at rescoping IPR.	Coastal Engineering	VT agreement on whether historic volume change analysis is needed.	
2	6/25/2014		Determination of design fill	Design vs. Adv Fill will be presented differently than traditionally done due to change in methodology employed to obtain renourishment interval via Beach-FX. Renourishment interval is based upon risk and is provided as a probability range (e.g. 3-5 yrs) instead of e.g. a specific 4 year renourishment interval.	Might have to hammer something out of beachfx into a traditional format. This is a communication risk as the modeling isn't set up this way, so benefits will not match exactly.	L	H	L	M	N/A Always fill in. If there is not a decision (whether that decision is made by district, MSC, HQ, or ASA) that is related to the risk, why are we listing this risk?	Risk based probabilistic model and all outputs will be reported in ranges rather than a single optimized value.	Extract information from Beach-fx in traditional format that VT and reviewers are familiar with.	Have a sufficient writeup for Vertical Team to teach this method. Present this methodology to coastal working group since they will be our reviewers. Present to VT at rescoping IPR.	Coastal Engineering	VT agreement on whether historic volume change analysis is needed.	
3	6/25/2014		Genesis modeling	Genesis modeling of preliminary array of alternative plans. Results feed into renourishment needs in BeachFX.	Adding time and money due to unnecessary model runs but an alternative plan may be screened out too early.	M	L	L	L	Plan selection	Modeling always adds time and money to studies so PDT is seeking opportunities to meet the 3x3x3 Paradigm.	Use Genesis only for pre-screened alts and locations (final array)	Present likelihood and consequence to VTM at IPR.	Coastal Engineering	VT agreement on GENESIS modeling of final array only.	
4	4/18/2012		Protection of hardbottoms during pumping, if nourishment	Moved to Environmental												
5	6/25/2014		Determination of Accessibility, Constructibility, Technique	Feeds into cost estimate. Costs could be underestimate or overestimated and affect plan selection.	Could impact project cost estimates and BCR rendering the TSP not in the public interest.	M	L	L	L	cost estimates, net benefits, plan selection	Past project experience is that it is too early to determine consequence and likelihood. Need to be at final array to determine.	Compare to other project construction actions within the region. Make this an item of consideration in CSRA.	Present as risk register item for discussion with VT at IPR.	Coastal Engineering, cost engineering	Improved cost estimate.	

Geotechnical

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1	6/25/2014		Borrow Area - County	Inadequate quantity or quality of material for 50 year project life.	Economic and implementation viability of project. Additional study time & cost to collect data if inadequate volume.	L	M	L	L	Cost comparisons for struct alts, det. Net benefits, periodic nourishments	County permit outlines one-time nourishment	Review permit of borrow area, available data for borrow area, and volume needs for 50 years.	Identify sand needs early in the study.	Geotech, cost estimating	50 years of borrow material identified in borrow area(s)	
2	6/25/2014		Borrow Area	Lease agreement or permit with BOEM	Schedule risk	L	M	L	M	Agency review of draft report	Past experience obtaining BOEM leases and tri-party MOAs. Conflicts with other counties' projects. Not required to complete feasibility, can complete in PED.	Start discussion with BOEM as soon as borrow area is identified.	Start discussion with BOEM as soon as borrow area is identified.	Geotech, environmental coordination	Task can be completed in PED phase.	Low for study.
3	6/25/2014		Core borings	There are many potential borrow areas. County project used St. Lucie Shoal but Fed project may use another borrow area, due to opposition from resource agencies.	Could cause time and cost delay if need additional borings for another source above and beyond what sponsor has done.	L	H	M	M	Cost comparisons for struct alts, determination of net benefits	County has completed some geotech investigations / analyses. Project may not have enough funding to do adequate borings for a different borrow source. Inadequate communication may lead to less strategic borings.	Perform geotech investigations early on	Use existing data to every extent and do strategic borings; communicate early and often if a new borrow source other than St. Lucie Shoal will be used.	Geotech	Id of adequate amount of borrow material.	
4	6/25/2014		Upland sand source and compatibility analyses	If upland source is used, material could be problematic if not fully analyzed	Economic and implementation viability of project.	M	L	M	L	Cost comparisons for struct alts, determine net benefits, periodic nourishments	Upland source used by county in 2006 was problematic and had to be replaced and it was costly.	Review of county data	If upland site is used, bring in geotechnical early to fully analyze	Geotech	Appropriate analyses of potential borrow sources	

Plan Formulation

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1	6/25/2014		Guidance currently unclear as to path forward with 3x3x3 paradigm. This is not appropriate to list here- not a scoping choice or task	PDT could steer study down path not in concert with higher authority interpretation of 3x3x3 paradigm.	Schedule Impact	M	M	M	M	All. Need to be more specific.	Many unknowns at this time	Engage vertical team through IPRs, re-scoping meeting and decision point milestone IPRs.	Obtain full clarification at IPRs.	Plan Formulation	3x3x3 compliant process	
2	6/25/2014		Refinement of study reach lengths for analyses down to R-98 to R-115..	NFS and / or Vertical Team may not agree with refined study reach lengths. Could be pointed out that we did not consider entire study area as directed by Congress.	Schedule impact, could impact Beach-FX modeling.	M	M	M	M	All. Need to be more specific.	Vertical Team meeting 11 Jun 2014 directed PDT to refine study reach lengths at beginning of study, possibly using public accessibility / parking as the tool to do so. Accretional between R-107 to R-108, initial future storm damage analyses do not economically justify project in screened reach, extensive COBRA units.	Include & obtain sponsor buy-in at re-scoping meeting when this is discussed. Obtain Vertical Team buy-in immediately after re-scoping meeting. Include discussion on entire study area, reasons why eliminated from further study, continue to focus screened measures on smaller reach.	include & obtain sponsor buy-in at re-scoping meeting when this is discussed. To include other areas could be LPP. Obtain Vertical Team buy-in immediately after re-scoping meeting.	Plan Formulation	Study proceeds seamlessly. VT agreement with study area length.	
3	6/25/2014		Increments - just 2 study area lengths to be evaluated.	This refers to the fact that the team has screened out R-77 to R-98, and now there are two big increments of R98-R103 and R103-R115.	This is logical to the team, but could cause questions at HQ, and possibly leading to delays in the schedule if HQ does not agree with the methodology logic.	M	M	L	M	Plan selection, incremental analysis	No erosion along northern study area, Coastal Barrier Resource Units, nearshore hardgrounds.	Inform VT on the logic and reasons behind the two increments early to get consensus and buy in.	inform VT on the logic and reasons behind the two increments early to get consensus and buy in.	Plan Formulation	VT agreement with study reach increments	
4	6/25/2014		Non-structural alts specifically for lot around R113	HQ may require team to look at this alt	Schedule impact. Technical difficulty of comparing benefits from BeachFX alts to other non-structural alts not possible to model in BeachFX.	M	M	M	M	Plan selection	There is essentially one structure around R113 which is gleaning a majority of the project damages.	Research the structure and foundation more in depth, to have a full picture of why so many damages are occurring at this location. Formulate alternative specifically for this location.	Consider in the plan formulation addressing this location specifically, possibly with measures only applied here.	Plan Formulation	Full evaluation of storm damages at this one structure.	

Project Management

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1	6/25/2014		New budget estimate falls within the new 3x3x3 guidance, \$3M from the restart point forward	Bust in the current schedule or estimate. \$3M and 3 years starts upon receipt of funding. Study spent in excess of \$1M.	Redo re-scoping and budget to reduce time and cost below \$3M and 3 years. Add study time and cost to re-scope.	L	L	L	L	Re-scoping guidance	Verbal HQ guidance concurs with restart at receipt of funding.	Hold re-scoping meeting.	Schedule Re-scoping IPR as soon as possible.	All		
2	6/25/2014		From Plan Formulation Risk #5, insufficient public access in southern reach.	Lack of access could affect determination of study area length, per 6-11-14 re-scoping VT meeting. If no access, affects the final cost sharing.	If insufficient public access provided, sponsor would pay more for project implementation. Sponsor likely to accept cost sharing.	L	M	L	L	Plan formulation, cost sharing	Per coordination with the sponsor, public access maps have been provided. Access is available in most places, small gaps only.	Include further coordination with sponsor on access. Include maps and other data in the report to describe cost sharing.	Include further coordination with sponsor on access. Include maps and other data in the report to describe cost sharing.	Plan formulation	Confirm cost sharing percentages	
3	6/25/2014		Study Execution	Lack of Federal Funding	If no additional Federal funds in FY15, study will be delayed. Sponsor unlikely to contribute additional non-Fed funds.	H	H	M	H	All	No Federal appropriations since FY10. Mini-pot received in FY14 to complete 3x3x3 compliance re-scoping. Not in FY15 budget.	Terminate study, ask sponsor to contribute funds.	Educate sponsor on budget process, draft agreements, continue budget requests for Federal funding	All	Receive sufficient Federal funds to meet Chief's report milestone.	

Real Estate

(A) Item	(B) Date entry was last updated	(C) Name(s) of person(s) assessing the task	(D) This is the task, decision, problem, question, issue, event, hazard, or opportunity that is to be managed.	(E) Briefly identify the risk. Considering the entry in column D, what can go wrong and how can it happen?	(F) 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.)	(G) If the most significant consequence in column F occurs what is its potential magnitude?	(H) What is the likelihood that the most significant consequence in column F will occur?	(I) How great is the uncertainty about either the consequence or likelihood of the risk identified in column E?	(J) Qualitative risk rating from lookup table, i.e. Column (G) & Column (H)	(K) Identify all the decision criteria that could be affected by the risk id'd. If an imp decision not rep'd among the decision criteria is affected, id it here.	(L) Enter specific evidence used to support the consequence, likelihood and risk ratings.	(M) Enter options for reducing the risk.	(N) Enter any preferred course for managing the risk. Tolerate the risk is the default option. <i>This should be one or more of the options listed in column M</i>	(O) Identify any other study tasks that could be affected by the outcome of the risk identified for this entry.	(P) Describe the effect of your recommended course of action on the study or project outcomes. <i>This should be filled in after the</i>	(Q) Make note of any significant information not provided in the other columns.
Risk #	Date	Assessors	Task	Risk and its cause	Consequence	Consequence Rating	Likelihood Rating	Uncertainty Rating	Risk Rating	Decision(s) Affected	Evidence for ratings you gave.	Risk Management Options	Recommendations	Study Tasks Affected	Outcome	Notes
1	6/25/2014		Easements, land owner who doesn't want the project	Significant delay in land certification; would have to go through eminent domain.	Would have large impact on costs and admin costs.	H	M	H	H	RE plan	Previous projects have had this problem	Compliance w/Fed and Corps policy	As project progresses, Sponsor can help us get a feel for public opinion. More public outreach as study approaches final array.	Real Estate coordination with PDT and the sponsor	Acceptable RE easements.	
2	6/25/2014		Construction staging area in some areas due to lack of public access	Location could have issues: unknown utility impacts.	Could be some cost or schedule delays during construction.	M	M	L	M	Cost estimate, completion of RE plan for draft report	Previous projects have had this problem	RE mapping done early to begin id and analyses of staging areas, cost comparisons for alts	Make sure engineering team researches early; keep it on PDT radar	Real Estate, cost engineering, coordination with Sponsor	Adequate staging areas for construction	
3	6/25/2014		Ownership issues	Not knowing who owns what (county, state, private) and multiple ownership rights.	Would be a time delay and could eventually lead to eminent domain as worst case.	L	L	L	L	RE plan	Previous projects have had this problem	Cost comparisons for structural alts, compliance w/Fed & Corps policy	Keep on radar; start early if we need to do title search	Real Estate, Sponsor	Corps compliant RE Plan	