

## FAQ Answers

- ***What does the project entail?***

Deepening the main federal navigation channel of the Delaware River from its current depth of 40 feet to 45 feet following the 102.5-mile existing main channel from the Port of Philadelphia/Beckett Street Terminal (Camden, N.J) to the Atlantic Ocean. The project also would deepen the Marcus Hook anchorage area and widen 12 bends on the river.

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- ***How much dredged material will be removed?***

During initial construction---remove approximately 26 million cubic yards of material using hopper, hydraulic pipeline, and bucket dredges.

Cubic yardage by area of the project includes approximately 18.7 million cubic yards from the river portion (amount includes approximately 77,000 cubic yards of rock in the vicinity of Marcus Hook, Pa.) and approximately 7.3 million cubic yards from the Delaware Bay.

Maintenance dredging for the 45-foot channel will increase to 4.317 million cubic yards per year from the current 3.455 million cubic yards per year for the existing 40-foot channel, a net increase of 862,000 cubic yards per year. Of the 862,000 cubic yards, approximately 480,000 cubic yards need placement in upland sites.

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- ***Where will the removed material be placed?***

Initial construction river portion (primarily sand, clay, silt) will be placed at six existing federal upland sites (National Park, Pedricktown North, Pedricktown South, Killcohook, Reedy Point South and Artificial Island) and three new upland sites identified as Raccoon Island, 15D and 15G. Reedy Point South will only be used for initial construction.

Maintenance quantities will continue to be placed at five existing sites (National Park, Pedricktown North, Pedricktown South, Killcohook, Artificial Island) and the three new upland sites.

Initial construction dredged material in the Delaware Bay (primarily sand) will be beneficially used to restore approximately 135 acres of wetlands at Egg Island Point, N.J. and approximately 60 acres of wetlands at Kelly Island, Del.; and for beach placement at Broadkill Beach, Del.

Maintenance quantities will be disposed at an existing approved subaqueous site (Buoy 10)

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- ***What is the basis for identifying benefits in the deepening project?***

The Corps, like several other federal agencies, estimates National Economic Development (NED) benefits for projects following the guidelines and procedures established in the 1983 Economic and Environmental Principles for Water and Related Land Resources Implementation Studies. We also use

- ***How do you define NED benefits?***

Principles and Guidelines define them as follows: “Contributions to national economic development are increases in the net value of the national output of goods and services, expressed in monetary unit. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the Nation. Contributions to NED include increases in the net value of those goods and services that are marketed, and also those that may not be marketed.” To quantify the NED benefits, we compute and compare total transportation costs, with and without, the improved navigation channel for each pertinent vessel class, by trade route, by commodity and by terminal destination.

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- ***How does this apply to the Delaware River Main Channel Deepening project?***

The channel improvement of a deep-draft navigation project represents a transportation infrastructure improvement to the U.S. port system. Channel improvements enable a more efficient movement of exports (to the ultimate benefit of U.S. producers) and imports (to the ultimate benefit of U.S. consumers). Bulk and container vessels, whether U.S. or foreign-owned, are the navigation mode of transport necessary to move exports and imports through U.S. ports in the accomplishment of international trade between countries. The Corps’ economic analysis compares the potential cost savings to the associated costs that would be borne for each of the potentially benefiting facilities. The focus is on the facility, not the current owner, since the history of the port shows constant change of ownership.

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- ***Specifically, how does the improved channel enable the more efficient movement of exports and imports?***

The deeper channel will allow some current vessels to carry more cargo as well as allow a fleet shift to larger vessels, thus more efficiently apportioning operating costs over a greater amount of tonnage.

Other vessels, such as large crude oil vessels that currently lighter at Big Stone Anchorage in the naturally deep water of the Delaware Bay, will continue to carry equivalent tonnage but will be able to operate more efficiently with a deepened channel and incur reduced lightering charges.

A deeper channel will also result in a reduction of transit times because of less tidal delays. Safety practices require vessels to maintain a three-foot minimum under keel clearance; limiting maximum unrestricted sailing drafts to 37 feet in the 40-foot channel.

Many liquid bulk and some dry bulk vessels currently use tidal advantage to arrive at port with sailing drafts up to 40 feet. These vessels travel more slowly and must “drift the tide to maintain safe under keel clearance. Deepening the channel would allow some of the vessels that currently take advantage of high tides (i.e., those currently drafting greater than 37 to 42 feet) to access port facilities more quickly, reducing transportation time with project conditions

Benefits would accrue to facilities south of an including the Marcus Hook reach that will have access to the 45-foot project in the year 2008, one year prior to full completion of construction in 2009. This includes crude oil refineries and petroleum products terminal, but not the dry bulk and containerized vessel terminals.

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- ***For what commodities were benefits estimated?***

Liquid bulk (crude oil and petroleum product imports), dry bulk (including cement slag and slab steel) and containerized cargo.

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- ***For what time frame are the economic benefits calculated?***

A 50-year study period from 2009 to 2058.

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- ***What are the categories of benefits?***

Vessel efficiencies (shift to larger vessels on specific trade routes for liquid bulk and dry bulk vessels.)

Operational efficiencies such as reduced crude oil lightering; more fully loaded liquid bulk, dry bulk and container vessels; reduced tidal delays thus reducing transportation costs.

Improved safety resulting in reduced natural resource injury from reduction of overall vessel calls for future commodity movements, reduced congestion, reduced “drifting the tide” practices, reduced lightering operations. All these would reduce probability of groundings, collisions, oil spills, and other contaminant spills.

Reduction of disruption of services from waterway closures and service disruptions from related cleanup, salvage and restoration services.

Beneficial uses of dredged material at Kelly Island and Egg Island Point and beach nourishment at Broadkill Beach

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- ***How much are the average annual benefits by commodity?***

All figures are approximate: \$24.7 million comprised of \$15.2 (liquid bulk – crude oil, petroleum products), \$3.5 million (containerized cargo – vegetables, fruit, eggs, meat requiring refrigeration), \$5.4 million (dry bulk – blast furnace slag, steel slabs) and \$605,000 (Beneficial use cost savings at Broadkill Beach, Del).

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- ***By facility?***

All figures are approximate: \$24.7 million comprised of \$14.8 million at the refineries broken down: \$6.2 million (Sunoco's Ft. Mifflin, Marcus Hook, Hog Island Facilities), \$4.7 million (Valero), \$1.3 million (Phillips 66 – Tosco), \$1.8 million (Coastal Eagle Point), \$0.7 million (Motiva); and \$9.3 million at the terminals broken down: \$1.8 million (Beckett Street), \$7.1 million (Packer Avenue), \$0.4 million (Delaware Terminals) and \$0.6 million (Cost savings at Broadkill Beach)

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- ***By State?***

All figures are approximate:

Pennsylvania: \$14.6 million (59%)

New Jersey: \$ 8.3 million (34%)

Delaware: \$ 1.7 million (7%)

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- ***What are other potential benefits not included in the economic reanalysis calculations?***

Gloucester Marine Terminals in Gloucester City, N.J. – steel imports from St. Petersburg, Russia.

Pier 122 Ports of Philadelphia – slag, clinker, or cement from Europe.

Port of Wilmington – expansion of facilities to the Delaware River to attract dry bulk such as steel and new types of cargo.

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- ***How much are the average annual costs?***

Based on May 2002 price levels and the Federal Fiscal Year 2002 discount rate of 5 7/8 percent, a project base year of 2009 for 50 years, the average annual costs are approximately \$20.9 million.

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- ***What makes up the costs?***

Initial construction plus interest, associated costs plus interest, annual Operations & Maintenance for the project, associated costs, real estate costs and navigation aids (See table 4-5 on page 20 of report for details)

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- ***What is the total project cost for initial construction?***

Approximately \$252 million.

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- *What is the federal/non-federal share?*

Federal share is approximately \$153 million (65%) and the non-federal share is approximately \$76 million (35%).

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- *What is the BCR?*

1.18 (Divide average annual costs by average annual benefits)

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## **Delaware River Main Channel Deepening Project Environmental Facts**

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- *How credible are the Corps' environmental studies and conclusions?*

In compliance with the National Environmental Policy Act, the Corps first prepared an Environmental Impact Statement (EIS) as part of the February 1992 Interim Feasibility Report. The document was coordinated with the appropriate federal and state agencies— EPA, Fish & Wildlife Service, National Marine Fisheries Service and the environmental agencies of Delaware, New Jersey and Pennsylvania—as well as the general public.

The Record of Decision for the Final Environmental Impact Statement was filed with EPA in December 1992, documenting supplemental environmental analyses to be conducted during the Preconstruction Engineering and Design phase of the project.

The need for the additional analyses was based on comments received during public coordination of the FEIS. The studies would address potential environmental impacts related to sediment transport, salinity changes, benthic organisms (shellfish), groundwater, wetlands, oil spills, endangered species and historic artifacts.

In close coordination with the above agencies and also the U.S. Geological Survey, the Corps spent about \$7 million over the next six years to conduct these studies.

We prepared a draft Supplemental EIS in December 1996 that documented in extensive detail the results of the additional studies and associated impacts.

The Final SEIS was filed with the EPA in July 1997, a public meeting was held in May 1998 and the Corps' Chief of Engineers filed the final Record of Decision with EPA in December 1998— documenting the Corps' finding that the project is environmentally acceptable and thus closing the NEPA process.

Following their review of the SEIS, all the above agencies concurred with the Corps' findings of no significant impact due to the deepening project.

The EPA made this statement in a letter dated Sept. 12, 1997: "Based on our review of the final SEIS, our concerns have been adequately addressed. Accordingly, we have concluded that the proposed project would not result in significant adverse environmental impacts; EPA has no objections to the implementation of the proposed project."

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- *Will the dredging stir up toxins that will contaminate drinking water and kill fish and other aquatic life?*

No. Contrary to some popular characterizations, the bottom of the Delaware River Main Channel is not comprised of "muck," "sludge" or "spoils." This material to be dredged is not toxic. It is relatively clean, natural, good quality material—mostly sand in the Delaware Bay, with greater amounts of clay, silt, gravel and rock upriver—that can be used in a variety of beneficial ways.

The Corps, in coordination with federal and state environmental agencies, has done extensive testing on potential impacts from sediment contamination at the new 45-foot depth—not only in the main channel, but also in feeder berths (such as those owned by oil companies).

Using state-of-the-art technology and EPA-certified labs, the Corps performed chemical analysis of channel sediments to determine actual contaminant concentrations and biological testing to evaluate toxicity concerns.

What the tests have shown is that those contaminants present, primarily heavy metals (such as zinc and lead) are at concentrations considered low to medium—meaning they are in a range that will not adversely affect drinking water supplies, water quality, or wildlife. PCB levels in particular are one to three orders of magnitude lower in the channel than in the river shallows outside the project area, and are not a concern with regard to protecting human life and aquatic resources.

With regard to toxicity concerns, several different species of sensitive aquatic organisms were exposed to channel sediment samples, using "bioassay" procedures approved by the U.S. Environmental Protection Agency. The tests, which are commonly used to evaluate the quality of dredged material, resulted in complete survival of all individuals. These results strongly indicated that channel sediments are not toxic to aquatic organisms.

In addition, "bioaccumulation" tests were run to evaluate the potential for contaminants to accumulate in aquatic organisms that would live in sediment placed for beneficial uses (wetland restoration) in the Delaware Bay. All tissues analyzed from these tests were representative of animals living in a clean environment.

The Corps' sediment quality data has been reviewed by the EPA, U.S. Fish & Wildlife Service, National Marine Fisheries Service and the environmental agencies of Delaware, New Jersey and Pennsylvania. All of these agencies have concurred that the sediment will not adversely affect human health or the environment.

The EPA stated it "continues to believe that there will be no adverse impacts associated with the disposal of sediments generated by the project." The U.S. Fish and Wildlife Service added, "Results of

chemical analyses provided within the biological assessment indicated that contaminant loads in the sediments tested are low."

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- ***What about reports of higher contaminant levels in certain portions of the river?***

The Corps' use of mean values (averages) in its sediment sampling follows accepted scientific practice for characterizing large numbers of data points.

With respect to higher values, in an independent review presented in November 1998, Mr. Rick Greene of the Delaware Department of Natural Resources and Environmental Control identified two channel bends in the upper portion of the river where the Corps' study data showed some heavy metal concentrations higher than what was generally observed in the overall channel.

One of these bends, located at the confluence of the Delaware and Schuylkill Rivers, will not be dredged as part of the deepening project.

The other bend is located just north of Pea Patch Island, Del. Analyzing data from the "worst case" sample concentrations in both bends, Greene evaluated the potential for water quality violations that could occur within 200 feet of a working dredge.

His analysis indicated that if suspended sediment concentrations were kept below 250 milligrams per liter of water, no violations would occur. Studies conducted by the Corps' Waterways Experiment Station confirm that conventional dredging operations stay below that threshold.

Greene's overall conclusion was thus the same as the Corps'—that the deepening project will not have any significant adverse impact. He concluded in his presentation, "Overall, the level of contamination in the main channel and bends is low to moderate, with much higher levels in the shallows."

Areas characterized as "shallows" are outside of the proposed dredging project. One important thing to bear in mind is that the Corps is dredging the Delaware River MAIN CHANNEL only—which ranges from 400 to 1,000 feet wide and which the Corps has been maintaining for more than 100 years—and not the whole river itself, which is considerably wider than the channel along its entire length.

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- ***Will the deeper channel push the salt line further upstream, thus also endangering drinking water and life in the river?***

The Corps commissioned a state-of-the-art, 3-D hydrodynamic/salinity model by the Corps' Waterways Experiment Station—based on the 1965-1966 "Drought of Record"—to predict upstream saltwater encroachment on drinking water and aquatic life in the river due to the deepening project.

The results showed that any increase in salinity would fall well below normal tidal and seasonal fluctuations, and within Delaware River Basin Commission chlorinity standards.

Independent studies conducted by the U.S. Geological Survey yielded similar results. USGS concluded, "Concerns about increasing the potential for saltwater from the river to infiltrate into the adjacent aquifers can be set aside."

In a related review, Dr. Eric Powell, director of Rutgers University’s Haskin Shellfish Research Laboratory and a nationally recognized expert on oyster ecology, concluded that the range of salinity changes predicted by the 3-D model would have no adverse impact on the oyster beds in the Delaware River and Bay.

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- ***Even if the deeper channel itself is not a problem, what about the private berths that oil companies and others will have to deepen as well?***

The Corps’ testing of the potential impacts of sediment contaminants included samples taken from the “feeder” berths adjacent to the channel.

Test results showed contaminant levels in the berths to be essentially the same as in the main channel—low to moderate and within an applicable range for environmental protection.

Moreover, port facilities currently maintain their berthing areas (at the 40-foot level) through dredging, for which they had to obtain permits from the appropriate state and federal agencies. So, these berthing area sediments have been tested in the past and have been found sufficiently clean to allow dredging operations.

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- ***Where will the Corps place all the dredged material from the project?***

Material from the river portion of the project is slated for placement at existing federal upland (riverside) disposal sites in New Jersey and Delaware.

The Philadelphia Regional Port Authority is required to ensure adequate disposal capacity by securing the land for additional upland sites that may be required during construction—or to identify “beneficial uses” for the dredged material to reduce those requirements.

The initial dredged material from the Delaware Bay is good quality sand that will be placed for beneficial use at Egg Island Point, N.J., and Kelly Island, Del., for wetland restoration and at Broadkill Beach for shore protection

The Kelly Island environmental restoration site is located in the Bombay Hook Refuge area in the State of Delaware. The plan is to use about sand from the bay to restore 60 acres of tidal wetland and protect approximately 5,000 feet of eroding tidal wetlands while also enhancing Bombay Hook – a National Wildlife Refuge and a Wetland of International Importance. The 5,000-foot berm to be constructed will provide habitat for spawning horseshoe crabs and migratory shorebirds.

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- ***What about the risk of groundwater contamination from dredged material disposal sites in New Jersey and Delaware?***

The dredged material disposal sites will not contaminate the underlying aquifers. Each of these riverside sites is essentially isolated from local groundwater supplies by an underlying silt and clay layer, and most runoff goes back into the river at least as clean as what was placed in the site.

Expanded groundwater data collection, performed independently by the U.S. Geological Survey, confirmed no significant adverse impacts to groundwater quality as a result of this project.

Concerns about “nicking” the aquifer during dredging operations—opening up a connection between the aquifer and the Delaware River—are moot because the connection already exists.

The Corps has already placed monitoring wells at the existing federal upland disposal areas. Eventually, they will be placed at all the remaining federal sites, as well as at any new sites that may be provided by DRPA, to periodically monitor groundwater over the project’s 50-year life.

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- ***What is being done about finding alternate uses for the dredged material to reduce upland disposal requirements?***

The Corps and DRPA consider the dredged material to be a resource, and not a by-product, that can be reused for a number of purposes, thereby reducing the need for new permanent upland disposal placement.

There are numerous potential applications for material from the Delaware River Main Channel. Recent uses include fill to support construction of Philadelphia International Airport’s commuter runway (about two million cubic yards), the River Winds golf course in West Deptford, N.J. and highway construction projects in Delaware. Recently, the DRPA and the Commonwealth of Pennsylvania began a test project to use 50,000 cubic yards of dredged material from the Corps’ Fort Mifflin Confined Disposal Facility to fill a mine stripping pit in Tamaqua, Pa. It is hoped that the project will lead to similar larger scale efforts in the future to solve a serious environmental problem in Pennsylvania and a dredged material capacity concern along the Delaware River. While this initiative is technically feasible, further investigation is needed to determine if this application is economically beneficial and environmentally sound.

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- ***What about the impact of all the rock blasting that will have to be done?***

Part of the deepening project involves removal of some 77,000 cubic yards of bedrock from the channel near Marcus Hook, Pa., by blasting—which the Corps did successfully in the same vicinity more than a decade ago for the current 40-foot project. This will be done by drilling holes into the rock and packing them with explosive to direct the force of the blast into the rock, with the depth and placement of the holes and the size of the charges controlling the amount of rock that is broken.

To protect the short-nosed sturgeon in that portion of the river, the Corps will restrict blasting to between Dec. 1 and March 15 (as recommended by the Delaware River Basin Fish and Wildlife Management Cooperative), use blasting methods that limit the magnitude of shock waves, and employ "scare charges" to move fish out of the area. A fish-monitoring program will also be in effect throughout removal activities.

Drinking water supplies will not be affected because the rock to be blasted lies at the base of the aquifer system, well below any path to groundwater.

- *What will the Corps do to ensure that no harm is done to the environment once the project begins?*

Despite the positive test results to date, the Corps intends to monitor water quality during project construction. We are committed to working with the Delaware Department of Natural Resources and Environmental Control, the New Jersey and Pennsylvania Departments of Environmental Protection and the EPA to ensure that our dredging and disposal operations, including wetland creation and protection at Kelly Island and Egg Island Point, do not have an adverse impact on human health or on the aquatic resources of the Delaware River and Bay.

Specifically with regard to the oyster population, the Corps, NJDEP and Rutgers University's Haskins Shellfish Research Laboratory have developed a monitoring plan that will ensure the long term potential impacts of any salinity changes have been accurately assessed.

Dredging will take place only around seasonal environmental "windows" to minimize impact on shorebirds, fish, horseshoe crabs and other marine habitat.

For the material to be dredged from upriver, the Corps has already placed monitoring wells at the existing federal upland disposal areas. Eventually, they will be placed at all the remaining federal sites, as well as at any new sites that may be provided by DRPA, to periodically monitor groundwater over the project's 50-year life.