



Hudson River

PCBs SUPERFUND SITE

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EPA Technical Requirements for Phase 2 of Hudson River Dredging Project

Factsheet

December 2010

The U.S. Environmental Protection Agency (EPA) has provided the General Electric Company (GE) with detailed requirements for the next phase of the project to remove sediment contaminated by polychlorinated biphenyls (PCBs) from the bottom of the Hudson River. PCBs are probable human carcinogens and can also affect the immune, reproductive, nervous, and endocrine systems. EPA developed the plans for the second part of the two-phased dredging project after a scientific review of data and information from the first phase of dredging by a group of independent scientific experts, and extensive input from a broad range of stakeholders.



Two hundred miles of the Hudson River are on the federal Superfund list of the most hazardous waste sites in the country. Approximately 40 miles of the upper Hudson River from Hudson Falls to Troy contains the most contaminated areas of river bottom. In 2002 EPA made a formal decision to dredge areas of this stretch. The cleanup project was divided into two phases to allow time to evaluate information from the first phase to make improvements before proceeding with Phase 2.

Enhancements, refinements and improvements made to Phase 2 from Phase 1 include:

Improved Sampling

- In advance of Phase 1, GE took some 50,000 samples of river sediment in order to delineate and design the dredging project. Unfortunately, many of the samples turned out to be incomplete or otherwise inadequate for the intended purposes.
- The result was that the quantity and depth of PCBs in the areas to be dredged was often underestimated. Phase 1 operations required multiple dredging passes in most areas.
- **Phase 2:** With the experience gained from Phase 1 sampling, GE is resampling using improved methodology to give more accurate and complete information on the extent of the contamination in the areas to be dredged. GE began this resampling effort this past summer.

Improved Dredge Design

- The Phase 1 dredging design consistently underestimated the “depth of contamination” (DoC), which is the depth of cut that the dredge operators must make on each pass. As a result, multiple dredging passes were needed in Phase 1.
- Underestimating DoC led to a less efficient dredging program that took longer than necessary.
- The reasons for the underestimation of DoC include the incomplete samples described above, but also the inadequate accounting for a high degree of variability in the contaminated sediment layer.

Improved Dredge Design (cont.)

- **Phase 2:** GE will be required to adjust the DoC calculations to take into account this variability. This means the dredger will dig deeper in certain locations in order to give greater assurance that all the PCB-contaminated sediments will be captured.

Fewer Dredge Passes

- In Phase 1, the plan allowed for multiple dredging passes—typically three to four—to capture as much of the PCB-contaminated sediments as possible.
- One consequence of the multiple dredge passes approach was that areas that had been dredged often stayed “open” (uncovered) for months while repeated re-sampling and re-dredging took place. During this time the exposed sediments were able to get back into the water column and/or were re-deposited on the river bottom.
- **Phase 2:** A maximum of two dredge passes will be used. In very rare circumstances, when a particularly high concentration of PCBs is unexpectedly discovered after the second pass, EPA will require a third.

Significantly Less Capping

- GE will be required to design the dredging project to achieve the cleanup target of 1 part per million of the most toxic PCBs, referred to as “Tri+ PCBs,” in all of the dredge areas.
- Due to certain physical constraints in the river (bedrock, clay and shoreline stability considerations) and other realistic limitations on the ability of dredging to achieve the cleanup target in all areas, there will be some areas that require a cap to isolate the relatively small amount of PCBs that remain after dredging occurs.
- Even in areas that require a cap, the vast majority of the PCBs will be dredged before the area is capped.
- **Phase 2:** EPA will limit capping at 11 percent of the total project area, not counting those bedrock/clay/shoreline areas where capping is the only option. In addition, within this 11 percent maximum of dredged area that may be capped under this performance standard, another lower limit of 3 percent has been established to even more stringently limit



capping over areas where significant PCB contamination remains below the top six inches of sediment after two dredging passes. By comparison, in Phase 1, 22 percent of the total acreage dredged was capped, not counting bedrock, clay and shoreline areas.

Increased Productivity

- During Phase 1, a total of 283,000 cubic yards of sediment were dredged by GE.
- **Phase 2:** The target for the second phase of the project is to dredge a minimum of 350,000 cubic yards of sediment each year. EPA expects that GE will be able to achieve even higher productivity, up to 500,000 cubic yards a year or more.

Protective Limits on Resuspension

- A fundamental goal of the project is to achieve a quick and significant reduction in PCB levels in fish tissue. Since the conclusion of Phase 1, fish samples collected in the fall of 2009 showed that —as always expected—there was a short-term increase in fish tissue PCB levels during and immediately after dredging operations. But fish samples collected in the spring and fall of 2010 showed *no* appreciable change from pre-dredging levels, also confirming EPA's predictions.
- Updated modeling and other projections provide strong evidence that anticipated rates of resuspension will not jeopardize the goals of the project; on the contrary, once the project is completed, fish are projected to show speedy and dramatic improvements as a result of the dredging.
- **Phase 2:** EPA is setting resuspension standards that take into account both the concentration of PCBs in the river water and the amount of PCBs moving downstream.
 - Both measurements are made at specified locations along the 40-mile stretch of the Upper Hudson in which the project is being carried out.



- If, at a designated measuring location, the concentration exceeds 500 parts per trillion of PCBs (equal to the maximum amount allowed in drinking water) for five days out of any seven, then GE may be required to take various steps. These steps include a temporary slowdown of operations or, in the unlikely event of a particularly high exceedance, a possible temporary shutdown of operations.
- The amount of PCBs allowed to travel down the river will not be allowed to exceed 2% of the total amount of PCBs actually excavated from the river bottom, as measured at designated locations downstream of where the dredging is taking place.
- At Waterford, the farthest downstream measuring station, the load may not exceed 1% of the amount excavated. If these limits are exceeded for specified periods of time, then GE may be required to take various steps, including a temporary slowdown of operations.

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- These standards, particularly the load standard at Waterford, will be re-evaluated, and may need to be adjusted and updated as dredging operations move from the uppermost portions of the 40-mile stretch of river into areas much further downstream.

These and other improvements to the second phase of the Hudson River dredging project will ensure that the momentum of the cleanup work in the river continues and that the biggest sources of ongoing contamination are addressed.

Flexibility to Make Changes

- As the Hudson River Peer Review Panel recommended to EPA, the plan for Phase 2 calls for constant evaluation of new data, and provides for adjustments as the project moves forward if needed to improve operations and meet project goals. EPA will make these determinations based on scientific data.

For more information or to view the technical documents that contain the details of Phase 2, visit www.epa.gov/hudson. Copies of the documents can also be viewed at EPA's Hudson River Field Office located at 421 Lower Main Street, Hudson Falls, NY.

EPA Contacts:

🔗 **Dave King, Director and Projects Coordinator**

EPA Region 2

Hudson River Field Office
421 Lower Main Street
Hudson Falls, NY 12839
(518) 747-4389
king.david@epa.gov

🔗 **Larisa Romanowski, Community Involvement Coordinator**

EPA Region 2

Hudson River Field Office
421 Lower Main Street
Hudson Falls, NY 12839
(518) 747-4389
romanowski.larisa@epa.gov