Document	EPA Response to Comments from County of Saratoga Board of Supervisors (HartCrowser) on Engineering Performance Standards – Public Review Copy Hudson River PCBs Superfund Site
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Reviewer	#	Comment	Topic	Response
County of Saratoga Board of Supervisors	1	An underlying factor in all of these topics is the very large scale of the dredging planned for the Upper Hudson. About 2.65 million cubic yards of sediment are to be removed over a period of six years. The project is far bigger in volume, area, and time than any environmental dredging project to date.	**Productivity** Scale of project **Residuals** **Resuspension**	USEPA believes that the Engineering Performance Standards, including the Productivity Standard, are achievable. Representatives of the environmental dredging industry state that the estimated 2.65 million cubic yards can be removed from the Upper Hudson River in even less time than the 2002 ROD allows. USEPA notes that at the Calamut River in Gary, Indiana, US Steel Corporation is working to remove 750,000 cubic yards of sediment from February to December 2003, and currently has a production rate of approximately 70,900 cubic yards per month using two hydraulic dredges. In comparison, the Productivity Standard requires a production rate of about 480,000 cubic yards in 7 months, which is approximately 68,600 cubic yards per month.

County of Saratoga Board of Supervisors	2	Protection of public water supplies, requirements for monitoring them, and procedures for notifying water supply operators in the event of elevated PCB concentrations are not addressed in the performance standard.	**Resuspension** Protection and monitoring of water supplies; notification of authorities	Contingencies for water supplies along with the warning procedures will be specified in the Community Health and Safety Plan (CHASP) required by the 2002 ROD. While leaving the main contingencies and notification requirements for the CHASP, it should be noted that the Resuspension Standard addresses the issues identified in the comment insofar as acceptable PCB levels are established that are protective of downstream users. Contingencies with respect to the dredging operations also are specified in the standard. In particular, the performance standard requires that dredging be temporarily halted if the PCB concentration at any far-field station is confirmed to exceed the federal maximum contamination limit, or MCL, for drinking water supplies of 500 ng/L Total PCB. The action levels should be exceeded before the Resuspension Standard is exceeded, prompting evaluation and modification to the remedial activities to better control releases prior to a temporary halting of operations. An exceedence of the 500 ng/L Total PCB standard does not necessarily indicate that the water entering the water treatment plants will be in excess of the standard. Water is added to the river from tributaries and drainage, diluting the concentration before reaching the intakes. The

				concentrations of PCBs can be further reduced by appropriate treatment.
County of Saratoga Board of Supervisors	3	The performance standard addresses only PCB in the water column. The authors state that other contaminants, including dioxins and metals, may be of' concern in sections of the river. Furthermore, New York State is developing water quality certification requirements, which will result in monitoring for contaminants in addition to PCB during the dredging.	**Resuspension** Other contaminants	Comment noted. The water quality certification requirements are still pending.
County of Saratoga Board of Supervisors	4	In Section 2.1.2, the point for measurement of the "resuspension export rate" is defined as 1 mile downstream of dredging, because beyond this point "further removal from the water column by particle settling becomes small." However, the authors also state "most of this settling (of particulate PCBs) takes pace *[sic]* within a few hundred yards of the dredge." USEPA should explain the apparent inconsistency between these distances and why the more protective, shorter distance was not chosen to define the export rate.	**Resuspension** Resuspension export rate, settling, use of 1 mile	The far-field stations that are one mile or more from the remediation are measures of resuspension export. Sampling within distances shorter than one mile will overestimate the amount of resuspension export, since the export of interest is the PCB loads released to downstream river sections. PCBs that settle within the river section being addressed are most likely to be addressed by subsequent dredging since the resettlement is likely to occur in the same areas identified for removal as part of the dredging program. The export rate will determine the long-term impacts of dredging on the fish body burdens and will also determine the concentration increases experienced by

				water supplies. The resuspension criteria at the far-field stations are structured to ensure that no long-term effects are caused by the dredging activities and are not directly based on the near-field modeling. The model analyses with the average source strength indicated that most of the coarse grained material will settle out within 30 meters from the dredge. However according to the model, the silts remain in the water column much longer. At one mile all the coarse material has settled. As shown in Attachment D Table 10 for the average source strength scenarios at 4000 cfs, approximately 60 percent of the silts resuspended remain in the water-column at one-mile. Therefore modeling a distance closer than one-mile will overestimate the export rate. Given that the silt fraction remaining is dependent on the flow and other factors, the fraction remaining at one mile varies. As noted in Section 3 of the standard, non-target areas downstream from the dredging may require sampling to ensure that elevated levels of PCBs have not been deposited, especially if the remedial areas are not contained. In addition, PCB sampling for the standard is limited to the far-field stations, because comparing the concentrations to the standard relies on knowing the baseline concentrations. The baseline concentrations will only be known at these far-field

				stations. Reliable baseline levels could not be estimated for points closer than the far-field stations, because of the baseline addition of PCBs could not be distinguished from the impact from dredging.
County of Saratoga Board of Supervisors	5	We are concerned about the validity of the analyses in Attachment A because of the manners in which data are grouped and correlations are used. Data are grouped and assessed arbitrarily by month. Where there are similarities among monthly data sets, data from more than one month are grouped. However, these monthly groupings varied by parameter (TSS and PCB), as well as by sampling station. For example, at the Fort Edward station, grouping included TSS data for September through November and PCB data from July through September. Different grouping were used at other stations. To be valid, such groupings should be based on a hypothesis of an underlying physical phenomenon that can be supported by statistical analysis of the data. USEPA should explain why the groupings of data are valid in the absence of such a hypothesis. The authors' success at developing correlations for the relationships among concentrations and flow varied by parameter and station. Some of the paired data appeared that they could be correlated. Where this was the case, further statistical analyses were conducted. However, such correlations are meaningless in the absence of a reasonable supporting hypothesis of physical phenomenon. And if a hypothesis is presented, it should be applicable for all sampling stations, unless there was some underlying, observable	**Resuspension** Grouping and correlation of data	Identification of the underlying physical phenomenon is not necessary for purposes of developing the Resuspension Standard. While the underlying processes are not directly reflected in the structure of the standard, the monthly basis is not accidental. This structure reflects the seasonal and often monthly variations in mean flow, temperature, biological activity and other conditions that have been historically shown to affect PCB and TSS levels. The purpose of baseline analysis is to determine the net impact of resuspension on water column concentration, and not predict the concentration in the future. The historical data indicated the similarity of some adjacent months' data. Since the mechanisms controlling the fate of different compounds are different, the same grouping should not be expected for different parameters at different stations. Pooling the data from adjacent months, when the mean of values for these months was not statistically different, increased the sample size and improved the estimate of the mean and variance. The semi-quantitative relationships were

		difference among the stations. USEPA should explain why the correlations are valid in the absence of such a hypothesis.		studied during analysis but not used as a basis for the standard as explained in Attachment A.
County of Saratoga Board of Supervisors	6	For this sensitivity analysis, the mass of PCB likely to be released is assumed to result from spillage and equipment handling. Therefore it is independent of river flow. As a result, the concentration in the water column will be inversely proportional to flow. That is, lower flows will result in higher concentrations of PCB. As far as it goes, this analysis is accurate, but it ignores an opposing phenomenon, that is, higher flow rates are associated with higher water velocities, which could increase sediment releases during dredging. As a result of this approach, the low flow period of May and June is identified as the "problematic times of the year during the dredging season wherein extra care will need to be taken to maintain minimal releases from the dredge to avoid exceedence of the Total PCB concentration resuspension criteria." Even if the dilution effect predominates and concentrations actually are higher during this low-flow period, the concern may be misplaced. The <u>concentration</u> criteria may be in jeopardy, but the <u>mass</u> of PCB being released downstream may be lower than during other periods.	**Resuspension** Sensitivity analysis, concentration criteria, mass of PCB released	USEPA took into consideration the various effects that flow and resuspension would have on the fluxes and concentrations in the water column and the effects each would have on fish body burdens and water supplies downstream. Therefore, the resuspension criteria have both flux and concentration components. The sensitivity analysis representing a large spill was structured to provide a worst-case scenario. In this case the low flow used was conservative and provided the highest concentrations. Modeling of higher flows would not have increased the PCB flux downstream since this type of release is considered largely independent of flow. In addition other releases were considered in the formulation of the resuspension criteria. The average source strength of resuspension is mostly dependent on the fraction of silt in the dredged material. Therefore the loads for individual sections will be largely independent of flow. The sensitivity analysis of the TSS-Chem model provided in Attachment D indicated that PCB flux, which is dependent on flow, is highly dependent on the sediment

				concentration and the silt fraction.
County of Saratoga Board of Supervisors	7	If monitoring during the dredging does show higher concentrations than expected, delays in the program could ensue.	**Productivity** Monitoring, delays	The Resuspension Standard and Residuals Standard include action levels designed to identify problems rapidly and put in place pre-designed controls. This framework supports the Productivity Standard, in that it should minimize any delays.
County of Saratoga Board of Supervisors	8	USEPA should explain the apparent difference between the USGS findings on the Fox River and the estimates of dissolved-phase releases for the Hudson River.	**Resuspension** Dissolved-phase releases	USEPA previously provided a detailed explanation in the 2002 Responsiveness Summary, which is part of the Agency's Record of Decision (see White Paper: Resuspension of PCBs During Dredging).
County of Saratoga Board of Supervisors	9	While such equipment is commercially available, continuous monitoring for months at a time will require significant maintenance, repair, and replacement. To ensure the quality and continuity of data, monitoring plans should provide for adequate checking, calibrating, maintenance, and replacement of equipment.	**Resuspension** Equipment upkeep, calibration	The sampling equipment type and maintenance will be addressed in the Remedial Design and in the development of the quality assurance project plans.
County of Saratoga Board of Supervisors	10	However, other refinements would be more stringent and could tend to reduce dredging productivity.	**Productivity** Refinements, stringency	Following Phase 1, USEPA will evaluate the interactions among the three standards to determine if any changes are necessary to the standards or to the dredging operations in Phase 2.
County of Saratoga	11	If, during dredging, resuspension is found to be greater than anticipated, this could cause significant delays	**Productivity** Scale of	As discussed above in Comment/Response #7, the Performance Standards for

Board of Supervisors		and shutdowns. Therefore, the issues addressed above are critical to the planning of the project. USEPA should promptly address these issues. In particular, the Community Health and Safety Plan should be completed, since protection of public water supplies is to be addressed in that document, not in the performance standards.	project **Residuals** **Resuspension** Delays, shutdowns	resuspension and residuals include action levels designed to identify these problems rapidly and put in place pre-designed controls. This should minimize any delays. As discussed above in Comment/Response #2, contingencies for water supplies, along with the appropriate warning procedures, will be specified in the Community Health and Safety Plan (CHASP). The standard addresses these issues listed by establishing acceptable PCB levels that are protective of downstream users. Contingencies with respect to the dredging operations are also specified in the standard. In particular, the performance standard requires that dredging be temporarily halted if the PCB concentration at any far-field station is confirmed to exceed the federal and New York State maximum contamination level (MCL), for drinking water supplies of 500 ng/L Total PCBs. The Community Health and Safety Plan will be prepared as part of remedial design before the dredging activities begin. The Resuspension Standard was based on a very conservative set of assumptions regarding the magnitude of the PCB releases as well as their subsequent impacts. Given these assumptions, it is considered highly unlikely that the standard will be routinely exceeded or that substantive long–term impacts will ensue. If during Phase 1,

				the Resuspension Standard is routinely violated, adjustments to the RD may be required. Even with exceedence of the Resuspension Standard it is unlikely that the public water supplies will be affected because the travel time between the remedial area and the water intakes allows time for the suppliers to take steps to treat the water or use alternate supplies. Additionally, dilution of the contaminants between the more proximal monitoring stations and the water supply intakes will serve to reduce the concentration. The CHASP will be completed prior to Phase 1 and will have the additional sampling requirements for the Lower Hudson River to be applied if the concentration at Waterford is greater than 350 ng/L
County of Saratoga Board of Supervisors	12	It does not address, however, the long-term integrity of engineered caps and the potential for subsequent residual transport. USEPA should clarify the program for monitoring of the caps and actions to be taken if any of the caps fail.	**Residuals** Integrity and monitoring of engineered caps	Cap construction and long term monitoring of integrity will be addressed as a part of the Remedial Design. However, the text of the residual performance standard will modified to reflect the fact that capping will also require long term monitoring of the cap integrity, with the specific requirements to be described in the Remedial Design.
County of Saratoga Board of Supervisors	13	The framework of the residual standard is extensive and complex. Administration of the procedure, resampling, laboratory analyses, and re-dredging may slow the dredging process. The amount of re-dredging that may be required is difficult to estimate and may	**Productivity** Dredging administration	The Residuals Standard was developed to address the range of circumstances that can reasonably be expected in the field. The selection of appropriate dredging equipment will occur during remedial design. General Electric Company will evaluate the range of

		vary significantly depending on the effectiveness of the selected dredging method.		dredging equipment and submit the design documents pursuant to the USEPA Administrative Order on Consent for Remedial Design. The design documents will be reviewed by USEPA and are subject to Agency approval prior to the dredging. Following completion of the dredging in a certification unit to the design cutlines, the Residuals Standard specifies the post-dredging sampling program and the actions to be taken depending on a comparison of the PCB concentrations to established values. In this way, the application of the standard has been streamlined. After the Phase 1 dredging, USEPA will evaluate the results to determine if changes are needed to the standards or to the dredging operations in Phase 2.
County of Saratoga Board of Supervisors	14	Furthermore, any deeper layers of contaminated sediment that are not adequately characterized during the remedial investigation will affect the project schedule when they must be addressed during construction. It is also not clear from the resuspension and residuals standards how adjacent certification units will be affected by subsequent dredging, resuspension, and deposition of nearby contaminated sediments. Counter to the general rule of working from upstream to downstream to avoid recontamination, re-dredging may require some upstream areas to be dredged after completion of nearby downstream areas. USEPA should explain steps for avoiding this condition and/or actions to mitigate re-contamination in the event of re-dredging.	**Productivity** Deeper sediment layer, re-dredging **Residuals** Certification units **Resuspension** Certification units	The precise sequence for dredging and procedures to avoid recontamination of downstream areas will be addressed in the remedial design. Procedures to avoid contamination of downstream areas that have been dredged during re-dredging at an upstream location may include silt curtains or silt barriers surrounding the re-dredging operation, delay of the post dredging sampling of the downstream area until re-dredging has been completed upstream, using a plain suction dredge to remove residuals at the upstream location, or a number of other techniques that are available. General Electric Company will

				set forth its approach in the design documents to be submitted to USEPA for Agency approval. Additional sampling will be required under certain conditions if the residual concentrations are not in compliance with the standard. This will add time to the schedule, but some time for this can be expected and accounted for in the design documents and scheduling for Phase 1. Agency review of the dredging delineation and cutline design also should reduce the potential for inventory to be encountered below the design cut-lines. As stated in Section 3.4 of the Resuspension Standard, the potential for resuspension to raise the PCB concentration in adjacent or downstream certification units may be investigated during Phase 1, especially if sediment barriers are not used. If the potential for recontamination of downstream or adjacent areas is not addressed sufficiently by sequencing or containment, additional actions will be required. For instance, a closed downstream certification unit might need to be re-sampled to confirm that recontamination has not occurred post-closure when work has been done upstream.
County of Saratoga	15	We believe the use of case study data is an appropriate approach to development of the Residuals Standard to	**Residuals** 0.25 ppm	The first part of this comment regarding the use of case studies is noted.

Board of Supervisors		attain the 1 mg/kg mean Tri+ PCB target concentration in residual sediment and other ROD goals. Section 2.1 (p. 5) states that the model indicated acceptable fish tissue recovery trajectories with a backfill Tri+ PCB concentration of 0.25 mg/kg or less. It is unclear from this statement and the information in the ROD as to whether the selected remedial alternative will, in the absence of the 0.25 mg/kg criteria, provide fish tissue recovery significantly faster than the No Action alternative or the Monitored Natural Attenuation alternative. USEPA should clarify this point before further action on the remedial design.	residual criteria	In the 2000 Feasibility Study, USEPA used its fate and transport and bioaccumulation models to show that a 0.25 ppm Tri+ PCB surface sediment concentrations in the areas targeted for removal results in acceptable long-term recovery of fish body burdens. The 0.25 ppm Tri+ is based on an assumed 4 inch thick residual sediment layer of 1 ppm Tri+ PCBs that has been completely mixed with 12 inches of clean backfill. The 2002 ROD specifies both an anticipated residual of approximately 1 ppm Tri+ PCB concentration and 12 inches of clean backfill (where appropriate), so USEPA did revisit these assumptions in developing the Residuals Standard. In addition, in the Appendix D of the 2000 Feasibility Study, USEPA modeled the impacts of residuals with concentrations of 2 ppm and 5 ppm Tri+ PCBs. The implementation of the dredging remedy will facilitate the recovery of the Hudson River, alleviating the continuous flux of PCBs to the water column and the bioavailability of PCB-contaminated surficial sediments associated with the existing and uncontrolled contaminated sediment inventory. The 0.25 mg/kg Tri+ PCB criterion in the Residuals Standard is a control on the remediation intended to maximize the benefits of the dredging

				remedy, further reducing the anticipated surface concentrations following dredging.
County of Saratoga Board of Supervisors	16	We believe that several problems may arise with implementation of the 0.25 mg/kg criteria. No contingencies for backfill material that fails the criteria have been established in the PSDR. If the original criteria of 1 mg/kg is met and the evaluation unit is certified, then it appears that retesting of the backfill may cause unnecessary project delays due to the difficulty associated with attaining low concentration in the backfill. For example, improperly specified and placed backfill may cause significant mixing and resuspension of soft, potentially contaminated, underlying sediments. This point is also acknowledged in Section 2.1.1 (page 5) of the PSDR. In addition, some areas (e.g., navigation channels) will not be backfilled after dredging; therefore, these would not be required to meet the 0.25 mg/kg criteria. USEPA should clarify the actions that will be taken if retesting indicates exceedence of the criteria.	**Productivity** Performance criteria **Residuals** Retesting of areas found to exceed criteria	Numerous studies have shown that backfill can be placed underwater without contaminating its upper layers with sediment. Mixing of the backfill with underlying sediments is usually confined to the first few inches at the bottom of the backfill layer. Assuming that the backfill will be free of PCBs or other contaminants when delivered to the dredged area, careful placement should ensure that it remains clean. Sampling of the backfill for comparison to 0.25 ppm Tri+ PCBs is required only if the average Tri+ PCB concentration of the residual sediment is between 1 ppm and 3 ppm, individual nodes are less than the PL action levels, the jointly-evaluated area is at 1 ppm Tri+ PCBs or less and the decision to backfill rather than re-dredge has been made. If backfill samples exceed 0.25 ppm Tri+ PCBs, the areas associated with the samples can be addressed, possibly by applying additional backfill. Exceedence of 0.25 ppm Tri+ PCBs is not expected to occur frequently because backfill can be placed without significant disturbance to the residual layer. This was demonstrated in the capping pilot study at the Alcoa Grasse River site.

County of Saratoga Board of Supervisors	17	USEPA should describe actions to be taken if unsuccessful dredging causes an increase in surface contaminant concentrations.	**Residuals** Achieving cleanup goals	The goal of the remediation is contaminant inventory reduction with a residual concentration of 1 ppm Tri+ PCBs. The Residuals Standard specifies actions to be taken if the residual concentrations exceed 1 ppm. The potential for the export of resuspended material to raise the surface concentration in areas downstream from remediation may also be investigated as a part of Phase 1, especially if sediment barriers are not used.
County of Saratoga Board of Supervisors	18	In areas that fail certification and require the construction of an engineered cap, additional dredging may be required to prepare the site for cap placement (i.e., to ensure that the cap elevation will be below the existing grade). Transport of dredging equipment between certification units may cause significant delays in schedule.	**Productivity** Capping issues **Residuals** Backfill	Capping of areas where the 1 ppm Tri+ PCBs criterion cannot be met would be expected to be performed during slack time in the project schedule or simultaneously with dredging activities in other areas. Construction of an engineered cap is never mandated by the standard – it is merely an option that can be considered. Regarding the need for additional dredging in near-shore areas, this consideration will be left to the Remedial Design and the remedial construction effort. It is likely, however, that recognition of this issue would result in a decision to simply re-dredge rather than to attempt to place a cap in an area of insufficient water depth. Scheduling of the dredging activities to meet production goals may require that the dredging equipment does not move long

				distances from an incomplete certification unit until the decision to cap or to continue dredging has been made. The example productivity schedule in the Productivity Standard accounts for the schedule impacts of transporting equipment between certification units.
County of Saratoga Board of Supervisors	19	Coring for confirmatory samples is not required to extend beyond the 6-inch sample interval; however, we believe that the cores should extend to refusal or to at least the anticipated depth of contaminated sediment. Collection and analysis of deeper sediments prior to re-dredging may prevent delays if removal of deeper contamination is required. Section 2.3.1 of the PSDR states that it may be desirable to collect and archive deeper sediment intervals. USEPA should provide a more definitive approach to this issue.	**Residuals** Sampling Issues	Samples from intervals below six (6) inches may be collected and archived for subsequent analysis (e.g., if the certification unit fails to meet the standard) to reduce the cost of sample collection, but this not required by the Residuals Standard. Additional characterization of the vertical extent of contamination is required under certain conditions, which entails sampling of intervals below six (6) inches. It is the responsibility of the designers to determine if it is important to the schedule to collect samples at depth, even if the samples ultimately do not require analysis.
County of Saratoga Board of Supervisors	20	Areas that could receive sediment from nearby areas through sediment transport should not be backfilled and verified until dredging is complete in those nearby areas. Resuspended material may be transported out of a certification unit and deposited within adjacent certified, backfilled areas causing recontamination of the surface sediments. Reasonable attempts should be made to avoid such occurrences.	**Residuals** Backfill **Resuspension** Transport of resuspended material	Backfilling should be conducted soon after dredging to avoid resuspension of the disturbed sediment and contamination of areas downstream. The remediation generally should be conducted from upstream to downstream, but where this is not possible, efforts should be made to limit the spread of contamination by export of resuspended sediment. This is a Remedial Design issue and it is likely that the impact

				of contamination of non-target downstream areas will be examined during Phase 1, especially if barriers are not used.
County of Saratoga Board of Supervisors	21	The USEPA should provide examples of similar environmental dredging/processing and hauling projects where production rates of this magnitude have been achieved.	**Productivity** Scale of project	As noted in Response to Comment #1, the Grand Calumet environmental dredging project is operating with a dredge production rates similar to that required by the Productivity Standard. This provides evidence, in addition to the supporting analyses such as the example productivity schedule, that the Productivity Standard can be achieved. Loading and hauling rail cars is usually an efficient and productive means of moving large volumes of material, so it is expected that this will not be a problem. Numerous examples are available of local projects requiring loading and hauling soil by truck at daily rates in excess of the requirements for this the Upper Hudson dredging project.
County of Saratoga Board of Supervisors	22	Dredges are prone to failure and slow to re-position; therefore, backup dredges need to be available to maintain this high rate of production.	**Productivity** Dredge failure, backup dredges	Agreed. The design of the dredging program should include contingencies for the rapid deployment of backup equipment if it is not already on site.
County of Saratoga Board of	23	Another area of concern relative to the production schedule is stabilization of disturbed shorelines.	**Productivity** Disturbed shorelines	The example schedule included in the Productivity Standard includes time for shoreline stabilization/restoration. The

Supervisors				assumed production rate used in the example schedule is 150 linear feet of shoreline stabilization per crew per 8-hour workday. Replacing docks and other riverside structures that must be removed for dredging is assumed in the schedule to require 1 crew-day per structure.
County of Saratoga Board of Supervisors	24	Hydroseeding will not be effective in the cold weather at the end of the seven-month dredging window. Therefore, scour of freshly-disturbed riverbank by river currents will likely cause erosion, elevated turbidity and suspended solids, and a continuing management headache for both local and state agencies.	**Productivity** Hydroseeding, scour of riverbank, erosion	During non-growing times, temporary cover (e.g., erosion control fabric, mulch) may be used. This will be addressed during the remedial design as part of the habitat delineation and assessment work being performed by General Electric Company pursuant to the USEPA Administrative Order on Consent for Remedial Design.
County of Saratoga Board of Supervisors	25	Other disturbed shorelines will receive stone fill and/or be restored in kind. Saratoga County's Hudson River riparian buffer could become a monotonous riprap shoreline without adequate input from local and state agencies. Wetland restoration is given only one paragraph in the document. Both shoreline and wetland restoration require that thought be given to ecological function. If adequate pre-planning is conducted, however, this could provide an opportunity for the County to have a Hudson River shoreline that meets several goals including parks, ecological diversity, and improved water intake quality. USEPA should provide more information on plans for shoreline restoration.	**Productivity** Shoreline quality **Residuals** Shoreline quality **Resuspension** Shoreline quality	The specifics of the shoreline restoration are part of the remedial design being performed by General Electric Company; they are not in the Engineering Performance Standards, other than the accounting of time needed to performed shoreline stabilization and restoration in the example schedule developed in support of the Productivity Standard. The opportunity for input will occur during the design process. The restoration of wetlands is included in the project and will be designed to meet USEPA and NYSDEC requirements.

County of Saratoga Board of Supervisors	26	The Executive Summary (Page ES-11) addresses capping, but does not specify its design life. Design life must take into account both physical factors at the surface and chemical and hydrologic factors within and below the cap. Will a standard cap design be used or will each cap require a unique design? Page ES-14 lists two categories of caps: residuals and isolation. It appears that the Construction Manager, in consultation with the USEPA, will be allowed to balance the cost of additional re-dredging and the impacts on the schedule.	**Productivity** Cap issues **Residuals** Cap issues	During remedial design, cap prototypes will be developed by General Electric Company and be subject to USEPA approval. These prototypes can be readily modified to suit the specific river conditions in the area to be capped. This approach is intended to minimize the time associated with capping. In addition, in developing the schedule for the dredging, General Electric Company will have to consider and plan for the time associated with capping.
County of Saratoga Board of Supervisors	27	It does not appear that the minimum production rate of 2,300 cy/day includes an allowance for re-dredging. Therefore, any re-dredging would require an increase in the production rate or additional time. Installation of caps will likely require additional dredging, as well. USEPA should include allowances for these activities in the schedule.	**Productivity** Production rate, re-dredging	USEPA believes that the Productivity Standard and the Residuals Standard adequately address re-dredging. The Productivity Standard accounts for re-dredging in that the example productivity schedule assumes that 50% of the time (total # of days) needed to perform the "design cut" dredging "attempt" will be required to perform re-dredging. The Residual Standard limits re-dredging to two attempts before an isolation cap is considered.
County of Saratoga Board of Supervisors	28	There is a flaw in the argument that presumes the conceptual schedule is conservative "since mechanical dredging is typically a slower process." This is only true when comparing large hydraulic dredges moving clean material compared to mechanical excavation.	**Productivity** Mechanical vs. hydraulic dredges	This is true when comparing large hydraulic dredges moving any clean or contaminated material to mechanical dredges moving the same material. The relative productivity of mechanical vs. hydraulic dredges depends more on whether the sediments are amenable to hydraulic dredging at all than

				whether the material is contaminated.
County of Saratoga Board of Supervisors	29	USEPA should present information supporting the theory of higher rates for hydraulic dredges.	**Productivity** Rates of hydraulic dredges	An analysis has been performed to compare environmental dredging for mechanical versus hydraulic techniques. The analysis showed that for distances up to about 5-6 miles from the processing facility, hydraulic dredging achieved greater production rates with fewer dredges than mechanical dredging. It is also noted that the dredging project currently underway on the Grand Calumet River (see response to Saratoga County Board of Supervisors No. 1) is employing two hydraulic dredges (one 12-inch dredge, and one 8-inch dredge) to dredge 750,000 CY of sediment in less than one year. Three booster pumps are also being employed. The 12-inch dredge, with a 750-hP dredge pump and the 8-inch dredge have been exceeding the 275 CY/hour dredge production rate assumed for hydraulic dredging in the Upper Hudson.
County of Saratoga Board of Supervisors	30	No public comment period is provided prior to the Engineering Performance Standards being refined or adjusted. Provisions for such a public comment period should be provided. Also, the procedure for selection of the "panel of independent experts," who will provide the peer review should be specified.	**Productivity** Public comment period **Residuals** Public comment period	As stated in the 2002 Record of Decision (pp. vi-v), there will be an opportunity for public comment on the data gathered during the first year of dredging with respect to the performance standards. The peer review of USEPA's Engineering Performance Standards will proceed in line with the Agency's Peer Review Handbook.

			Resuspension Public comment period **Peer Review** Selection of Experts	The purpose of the peer review is to ensure that the engineering performance standards are technically adequate, properly documented, and satisfy established quality requirements. USEPA has contracted with ERG, a consultant firm experienced in facilitating peer reviews, to help the Agency with the peer review of the Engineering Performance Standards. With respect to the current peer review, consistent with its Peer Review Handbook, USEPA solicited names of potential peer reviewers from the public. After performing an initial screening of candidates nominated by USEPA and the public, the Agency forwarded to ERG for consideration an alphabetical list of candidates for which USEPA did not identify a conflict of interest. USEPA did not identify to ERG which entity nominated each candidate on the alphabetical list, nor did USEPA recommend that ERG select or not select any candidates on the list. ERG also performed its own conflict of interest and qualifications review of those candidates. In addition, ERG conducted its own search for peer reviewers and is ultimately responsible for selecting the independent experts for the peer review panel. ERG screened potential candidates for conflicts of interest as part of its own selection process. It is USEPA's understanding that

				each of the peer reviewers is free of any conflict of interest.
County of Saratoga Board of Supervisors	31	If stabilization is planned to include vegetation (e.g., hydroseeding), then the word "completed" must be defined as germinated and sufficiently rooted to withstand "spring high flow period in the river."	**Productivity** Hydroseeding	The Productivity Standard requires that stabilization of the shoreline be completed by the end of the calendar year. Regardless of whether a section of the shoreline will be seeded to grasses, it must be stabilized by the end of the year to prevent erosion during the following Spring high flow period. Any stabilization work depending upon vegetation to prevent erosion will be sufficiently rooted and established before the end of the project.
County of Saratoga Board of Supervisors	32	Saratoga County should review these locations of dredging in the navigational channel [as shown on Figure 3A-1] and address any effects on navigation or recreational uses.	**Productivity** Navigation, recreational uses	USEPA notes that the information on sediment characteristics provided in the map is being updated for remedial design by General Electric Company pursuant to the USEPA Administrative Order on Consent for Sediment Sampling. The remedial design reports that identify the areas of the navigation channel that will be dredged in connection with the remedy will be made available to the public.
County of Saratoga Board of Supervisors	33	USEPA should explain the apparent anomaly between expected average rates and the overall goal of completing the work.	**Productivity** Dredging rates	The average daily dredging rate shown in Table 2-1 of the Productivity Standard is simply a calculation of the volumes to be dredged in a given year divided by the time (e.g., number of weeks) available during the dredging season. This calculation is provided merely as a starting point for evaluation of the example productivity

				schedule developed in support of the Productivity Standard. In fact, USEPA accounted for the possibility of a substantial amount of downtime. Therefore, the equipment selected for purposes of the example productivity schedule is capable of removing sediment at a considerably higher rate than that represented by Table 2-1. There are many conservative assumptions in the example productivity schedule Thus, there is no anomaly. USEPA will clarify p. 5 of the Productivity Standard.
County of Saratoga Board of Supervisors	34	Night operations will become more likely as the schedule slips. We note that Saratoga County has stated previously that seven-day, 24-hour dredging operations are unacceptable.	**Productivity** Hours of dredging operations	The 2002 ROD does not restrict the hours of the dredging project. As noted above, USEPA does not believe it is realistic to assume 24 hours of dredging a day, 7 days a week. The hours of operation will be a function of the remedial design being developed by General Electric Company to comply with the performance standards being developed by USEPA, including the quality-of-life standards such as noise.
County of Saratoga Board of Supervisors	35	USEPA should provide examples of production rates that have been achieved for sustained periods on other projects.	**Productivity** Production rates **Residuals** Production rates	As discussed above in the Comment/Response #1, on the Grand Calamut River in Gary, Indiana, US Steel Corporation is working to remove 750,000 cubic yards of sediment in about 12 months. Dredging began in February 2003 and is expected to be completed before December 2003. The current production rate is approximately 70,900 cy per month using

				two hydraulic dredges (a 12 inch cutterhead and an 8 inch cutterhead). In comparison, the Productivity Standard requires a production rate of about 480,000 CY in an estimated season of 7 months or approximately 68,600 cy per month. Representatives of the environmental dredging industry state that the estimated 2.65 million cubic yards can be removed from the Upper Hudson River in even less time than the ROD allows.
County of Saratoga Board of Supervisors	36	If the facility is in Saratoga County, impacts to neighbors will need to be addressed.	**Productivity** Impacts to neighbors	This issue is being addressed by USEPA through its facility siting process. It is not particularly germane to the development Engineering Performance Standards.
County of Saratoga Board of Supervisors	37	In general the minimum production rate does not include re-dredging or material removed for cap installation. This makes an already aggressive production schedule even more unlikely to be achievable.	**Productivity** Minimum production rate	The example production schedule includes time for re-dredging and capping, and indicates that the project can be completed within the time frame established by the 2002 ROD. As discussed above in Comment/Response #27, both the Productivity Standard and the Residuals Standard address re-dredging and cap placement. The example productivity schedule assumes that 50% of the time (total # of days) needed to perform the "design cut" dredging "attempt" will be required to perform re-dredging. The Residual Standard limits re-dredging to two attempts before an isolation cap is

				considered. USEPA believes this adequately addresses re-dredging and capping concerns with respect to the project schedule.