PHASE 2 PERFORMANCE STANDARDS COMPLIANCE PLAN FOR 2012

Appendix D

to

Remedial Action Work Plan for Phase 2 Dredging and Facility Operations in 2012

HUDSON RIVER PCBs SUPERFUND SITE

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SECTION 1

INTRODUCTION

1.1 OVERVIEW

This *Phase 2 Performance Standards Compliance Plan for 2012* (2012 PSCP) has been prepared by the General Electric Company (GE) pursuant to the Consent Decree (CD) executed by the United States of America and GE in October 2005 and entered by the United Stated District Court for the Northern District of New York on November 2, 2006. It applies to the second year of Phase 2 (2012) of the Remedial Action (RA) selected by the U.S. Environmental Protection Agency (EPA) to address polychlorinated biphenyls (PCBs) in sediments of the Upper Hudson River, located in New York State, as described in EPA's February 2002 Record of Decision for the Hudson River PCBs Superfund Site (EPA 2002). This 2012 PSCP describes the actions that GE will take during 2012 to implement the Engineering Performance Standards (EPS), the Quality of Life Performance Standards (QoLPS), and the substantive water quality requirements (WQ Requirements) issued by EPA for Phase 2 pursuant to the CD.

The CD includes, as Appendix B, a *Statement of Work for Remedial Action and Operations, Maintenance and Monitoring* (SOW), which, in turn, includes a number of attachments specifying requirements for various aspects of the RA. EPA issued revised versions of the SOW and its attachments for Phase 2 in December 2010. These attachments include a document titled *Critical Phase 2 Design Elements* (Phase 2 CDE, Attachment A to the revised SOW), a *Phase 2 Remedial Action Monitoring Scope* (Phase 2 RAM Scope, Attachment B to the revised SOW), a *Phase 2 Performance Standards Compliance Plan Scope* (Phase 2 PSCP Scope, Attachment C to the revised SOW), and a *Phase 2 Remedial Action Community Health and Safety Program Scope* (Phase 2 CHASP Scope, Attachment D to the revised SOW).

The Phase 2 EPS consist of a Resuspension Performance Standard, a Residuals Performance Standard, and a Productivity Performance Standard. These standards are set out in a document titled *Hudson River PCBs Superfund Site – Revised Engineering Performance Standards for Phase 2*, issued by EPA in December 2010 (EPA 2010a, cited as Hudson Phase 2 EPS).

The Phase 2 QoLPS consist of performance standards applicable to air quality, odor, noise, lighting, and navigation. These standards are described in a document titled *Hudson River PCBs Superfund Site Quality of Life Performance Standards*, issued by EPA in May 2004 (EPA 2004), as modified by a memorandum titled *Quality of Life Performance Standards – Phase 2 Changes*, issued by EPA in December 2010 (EPA 2010b), and the revised SOW attachments mentioned above. (These standards, as so modified, are collectively cited as Hudson Phase 2 QoLPS.)

The Phase 2 WQ Requirements consist of: (1) requirements relating to in-river releases of constituents not subject to the EPS; and (2) substantive requirements for discharges from the

sediment processing facility to adjacent surface waters (i.e., the Champlain Canal and Bond Creek). These WQ Requirements are set forth in documents titled *Substantive Requirements Applicable to the Release of Constituents not Subject to Performance Standards*, *Substantive Requirements of State Pollutant Discharge Elimination System Permit for Potential Discharges to Champlain Canal (land cut above Lock 7)*, and *Substantive Requirements of State Pollutant Discharges to the Hudson River*, all of which were provided by EPA to GE on January 7, 2005 (EPA 2005) – as well as in a set of substantive requirements provided by EPA to GE on September 14, 2006 relating to storm water discharges to Bond Creek (EPA 2006) – with the modifications to the first of the above-listed documents that are set forth in Section 6 of the Hudson Phase 2 EPS and the revised SOW attachments mentioned above. (The above-cited documents, as so modified, are collectively cited as Hudson Phase 2 Substantive WQ Requirements.)

The revised SOW requires GE to submit a number of work plans for implementation of Phase 2 of the RA. Among other things, it requires GE to submit a Remedial Action Work Plan (RAWP) for Phase 2 Dredging and Facility Operations for each construction year of Phase 2, and it requires that that work plan include a Phase 2 PSCP to set forth the actions that GE will take to address the EPS, QoLPS and WQ Requirements during the subject year of Phase 2. As required by the revised SOW, this 2012 PSCP has been prepared as an appendix to GE's *Remedial Action Work Plan for Phase 2 Dredging and Facility Operations in 2012* (2012 RAWP). Where items required to be included in this PSCP are set forth in another document submitted pursuant to the revised SOW, this Phase 2 PSCP references the relevant portion(s) of such document. These documents include: (a) the *Phase 2 Final Design Report for 2012* (2012 FDR; Arcadis 2012); (b) the main text of the 2012 RAWP; (c) the *Phase 2 Remedial Action Monitoring Quality Assurance Project Plan* (Phase 2 RAM QAPP; Anchor QEA 2012), which specifies in greater detail the monitoring and sampling activities to be conducted by GE during the remainder of Phase 2; and (d) the *Phase 2 Remedial Action Community Health and Safety Plan for 2012* (2012 CHASP), submitted as Appendix F to the 2012 RAWP, which describes GE's community health and safety program for the 2012 season of Phase 2.

This 2012 PSCP represents an updated version of the PSCP submitted to and approved by EPA for the first year of Phase 2 dredging in 2011 (Phase 2 Year 1), with certain clarifications and modifications based on discussions with EPA. Like that PSCP, it has been prepared to be consistent with the Phase 2 Performance Standards and the Phase 2 PSCP Scope, with agreed-upon clarifications and modifications.

During implementation of the 2012 construction season of Phase 2, further revisions to this 2012 PSCP may become necessary due to design changes, adaptive management changes made pursuant to Section 7 of the revised SOW, or other reasons. Any such revisions will be submitted to EPA for review and approval. Any actions taken by GE during the 2012 season of Phase 2 to implement the Phase 2 EPS, QoLPS and WQ Requirements will be governed by this 2012 PSCP, as approved by EPA, and any EPA-approved revisions thereof.

In addition, this PSCP will be revised and updated for each subsequent year of Phase 2, taking into account any further revisions of the Phase 2 EPS, QoLPS, and WQ Requirements made during the course of Phase 2 through the adaptive management process described in Section 7 of the revised SOW. The revised PSCP for each such year will be submitted to EPA for review and approval pursuant to the revised SOW.

Any changes required by EPA to the Phase 2 EPS, QoLPS and WQ Requirements or to any of the other requirements or provisions contained in this 2012 PSCP will be made through the adaptive management process described in Section 7 of the revised SOW and will be subject to the limitations and considerations set forth therein.

1.2 DOCUMENT ORGANIZATION

This Phase 2 PSCP includes the following sections:

Section 1 – Introduction: This section presents general information about this 2012 PSCP.

Section 2 – Resuspension Performance Standard: This section summarizes the Resuspension Performance Standard as set forth in the Hudson Phase 2 EPS. It covers the routine control measures and best management practices (BMPs) included in the 2012 FDR to address resuspension, the routine and contingency monitoring to be performed to assess achievement of the criteria in the standard, the contingency/responses actions to be taken in response to an exceedance of those criteria, reporting under the standard, and the special studies to be conducted in connection with this standard.

Section 3 – Water Quality Requirements for In-River Releases of Constituents not Subject to Performance Standards: This section discusses the WQ Requirements for in-river releases of constituents not subject to the EPS, as set forth in the Hudson Phase 2 Substantive WQ Requirements. It covers monitoring requirements, responses in the event of an exceedance of an applicable standard or an observation of distressed or dying fish, and reporting requirements.

Section 4 – Residuals Performance Standard: This section discusses the Residuals Performance Standard as set forth in the Hudson Phase 2 EPS. It describes the components of the standard, including verification of achievement of the design dredge elevation, sampling and analytical procedures for sediments following dredging, evaluation of the sampling data, the responses to be taken based on the sampling data, limits on capping, reporting procedures, and the special studies under this standard.

Section 5 – Productivity Performance Standard: This section discusses the Productivity Performance Standard as set forth in the Hudson Phase 2 EPS. It references the dredging production schedule established in the 2012 RAWP, and summarizes the monitoring and reporting requirements for productivity.

Sections 6 through 9 – Performance Standards for Air Quality, Odor, Noise and Lighting: These sections relate to the quality-of-life standards for air quality, odor, noise and

lighting, as set out in the Hudson Phase 2 QoLPS. They cover design analyses to assess achievement of these standards in the 2012 season, the routine control measures included in the design for that season to achieve these standards, routine and contingency monitoring during operations, responses to be taken in the event of an exceedance of an applicable standard or other trigger level, procedures for responding to complaints, and reporting procedures.

Section 10 – Navigation Performance Standard: This section discusses the QoLPS for river navigation during Phase 2 dredging. It describes the general requirements of the standard, the actions GE will take to meet the standard in 2012, the routine notice and monitoring procedures, contingency actions in the event of a deviation from the applicable requirements, procedures for responding to complaints, and reporting procedures.

Section 11 – Substantive Water Quality Requirements for Discharges to Surface Water: This section addresses the effluent limitations and discharge monitoring requirements applicable to the discharges from the water treatment facility to the Champlain Canal (land cut above Lock 7) and the non-contact storm water discharges to Bond Creek, as well as the associated response actions and reporting procedures.

Section 12 – References: This section provides bibliographic references to documents referred to in this 2012 PSCP.

SECTION 2

RESUSPENSION PERFORMANCE STANDARD

This section discusses the Phase 2 Resuspension Performance Standard set forth in the Hudson Phase 2 EPS (EPA 2010a) as it will apply to dredging operations conducted in the 2012 season. This section provides an overview of the standard, a discussion of the control measures and BMPs included in the Phase 2 design for 2012 in an effort to reduce resuspension, a summary of the routine and contingency monitoring to be performed to assess achievement of the criteria in the standard, a description of the contingency/response actions to be taken in response to an exceedance of those criteria, and a discussion of reporting under the standard.

2.1 OVERVIEW OF STANDARD

The Phase 2 Resuspension Performance Standard specifies three types of criteria: (1) an Advisory Level applicable to total suspended solids (TSS) concentrations at near-field monitoring stations (located downstream of but relatively close to the dredging activities – typically, approximately 300 meters downstream from the further downstream dredging operation, to the extent practical); (2) a Control Level applicable to the net loads (i.e., loads above baseline) of PCBs with three or more chlorine atoms (Tri+ PCBs) at certain far-field stations (located more than one mile downstream of dredging activities); and (3) a Control Level applicable to the concentrations of total PCBs (TPCBs) at certain far-field stations. During the 2012 dredging season, GE will implement a number of BMPs and other control measures, discussed in Section 2.2 below, in an effort to reduce resuspension. In addition, during that season, TSS concentrations, Tri+ PCB loads, and TPCB concentrations will be routinely monitored and compared against the applicable criteria through a monitoring program described in detail in the Phase 2 RAM QAPP and referenced in Section 2.3. In the event that the monitoring data show an exceedance of an applicable criterion (as described below), additional monitoring and/or contingency response actions may be required, as described in Sections 2.4 and 2.5. The three types of criteria specified by the Phase 2 Resuspension Standard are described below.

2.1.1 Advisory Level for TSS Concentrations

Under the Phase 2 EPS, the Advisory Level for TSS concentrations in the near field is a net increase in TSS concentration of 100 milligrams per liter (mg/L) above ambient (upstream) conditions at the near-field monitoring station located downstream of the dredging operation. To exceed this criterion, this condition must exist on average for a 24-hour sampling compositing period.

2.1.2 Control Level for Tri+ PCB Net Loads

The far-field numerical net Tri+ PCB load criteria consist of a seasonal or cumulative net load that will be tracked via daily percent release criteria. The Hudson Phase 2 EPS stated that the cumulative net load criteria for each dredging season are 2 percent (at the first far-field station which is at least one mile downstream of the dredging) and 1 percent (as monitored at the Waterford station) of the Tri+ PCB mass removed during the dredging season, regardless of stream flow rates. For the 2012 dredging season, EPA has specified a modification of this standard under which the cumulative net load criterion for the first far-field station at least one mile downstream of the dredging operation will be applied at the Lock 5 monitoring station rather than the Thompson Island station. The cumulative net load criteria will be applied through use of daily PCB percent release criteria as follows during the 2012 dredging season:

- The daily PCB percent release criteria are 2 percent and 1 percent of the Tri+ PCB mass to be removed, as measured at the Lock 5 and Waterford monitoring stations, respectively, if concurrent stream flows measured at Fort Edward are under 5,000 cubic feet per second (cfs) on average for that day. If the average flow for that day is greater than 5,000 cfs, the specified percentages increase to 3 percent and 2 percent at the Lock 5 and Waterford stations, respectively.
- Attainment of the daily Tri+ PCB percent release criteria will be determined based on a 7-day running average as follows:
  - For the Lock 5 far-field station, the load Control Level will be considered to be exceeded if, for 14 consecutive days, the 7-day running average Tri+ PCB net load exceeds the applicable Control Level percentage (2 percent or 3 percent, depending on river flows, as described above) of the corresponding 7-day running average of the Tri+ PCB mass removed. In the case of an exceedance, EPA may require GE to conduct an evaluation of the dredging operations and/or to implement operational changes, which may include a slowdown (but not shutdown) of dredging operations.
  - For the Waterford station, the load Control Level will be considered to be exceeded if, for 21 consecutive days, the 7-day running average Tri+ PCB net load exceeds the applicable Control Level percentage (1 percent or 2 percent, depending on river flows, as described above) of the corresponding 7-day running average of the Tri+ PCB mass removed. In the case of an exceedance, EPA may require GE to conduct an evaluation of the dredging operations and/or to implement operational changes, which may include a slowdown (but not shutdown) of dredging operations.
  - If EPA requires a slowdown of dredging operation, normal operations will resume when the 7-day running average Tri+ PCB load is below the 3 percent, 2 percent or 1 percent load criterion, as the case may be, or as otherwise allowed by EPA.

- Through adaptive management, EPA will consider adjustments to the 7-day running average period for the load criteria if high flow conditions in the river and the effect of time of travel on export rates are coincident with high frequency of exceedances at the far-field stations.

For the 2012 dredging season, the cumulative net load criteria will be calculated as 2 percent (at Lock 5) and 1 percent (at Waterford) of the Tri+ PCB mass removed during that season. The Tri+ PCB mass removed will be calculated using the methodology described in Section 7 of the Hudson Phase 2 EPS with the following modifications:

- The core segment and whole core lengths will not be adjusted based on core recovery.
- The PCB volumetric concentration equation in Step 4 of Section 7 of the Hudson Phase 2 EPS may be used to calculate average concentrations for each Certification Unit (CU) or portion thereof, as applicable.

The 7-day running average percent release criteria will be calculated as follows:

- The Tri+ PCB mass removed will be calculated on a weekly basis by comparing the pre-dredging bathymetry for the areas dredged that week with weekly post-dredging bathymetry.
- The daily Tri+ PCB mass removed will be estimated by apportioning the weekly Tri+ PCB mass removed equally to the days of dredging in that week by dividing the total mass removed by the number of dredging days in that week.
- The Tri+ PCB mass removed for the 7-day running average will be calculated by summing the estimated daily Tri+ PCB mass removed for the day being evaluated with the previous 6 days' estimated Tri+ PCB mass removed.
- The daily net Tri+ PCB mass passing the Lock 5 and Waterford stations will be calculated by subtracting the estimated baseline load from the gross load, using the methodology described in Section 4.3 of the Hudson Phase 2 EPS.
- The 7-day running average percent release will be calculated for each day by summing the daily net Tri+ PCB loads for each station measured over the previous 7 days, and dividing by the corresponding estimated Tri+ PCB mass removed during the same 7 days.
- The applicable Tri+ PCB load criteria (e.g., 1, 2, or 3 percent) will be selected on a daily basis by averaging the flow reported by the USGS at Fort Edward to a daily number and selecting the daily criteria that corresponds to the resulting average flow. The criterion that applies to each day will then be averaged to provide a 7-day running average criterion for comparison to the 7-day running average percent release.

In addition to the calculations described above, GE will calculate the net PCB load at the near-field buoy array downstream of dredging operations, taking into consideration the incoming PCB load as measured at the upstream buoy. When multiple dredges are working in one area,

they will be evaluated as a group, considering the distance between the downstream dredges and the monitoring location. Where dredge areas are isolated or sufficiently far away from each other that assessing them as a group is not appropriate, additional near-field buoy arrays will be used to assess those isolated dredging operations. In either case, the resulting load calculations will not be subject to any specific criteria, but will be used solely for engineering evaluation purposes, as needed.[1]

2.1.3 Control Level for Total PCB Concentrations

The Control Level for water column PCB concentrations is a TPCB concentration of 500 nanograms per liter (ng/L), equal to the federal Maximum Contaminant Level (MCL) for drinking water, at far-field monitoring stations. This criterion will be applied as follows during the 2012 dredging season, in which dredging will be performed only in River Section 1:

- A confirmed exceedance of the 500 ng/L criterion will be deemed to occur if the water column monitoring shows an initial occurrence of a TPCB concentration equal to or above 500 ng/L at a far-field station and the TPCB concentration of the sample collected at that station on the next day is equal to or greater than 500 ng/L.
- If and when there is a confirmed exceedance of 500 ng/L TPCBs at the Lock 5 monitoring station, EPA may require GE to conduct an evaluation of the dredging operations and/or implement BMPs that do not require GE to slow down or shut down the dredging operations.
- If and when concentrations exceed 500 ng/L TPCBs at the Lock 5 monitoring station for five days out of any seven-day period (including non-dredging days), EPA may require GE to conduct an evaluation of the dredging operations and/or implement operational changes, which may include a slowdown or shutdown of dredging operations. In general, a slowdown and evaluation of operations would be required before shutdown, with shutdown being the operational change of last resort.
- If there is a confirmed exceedance of 500 ng/L TPCBs at the Waterford monitoring station, EPA may require GE to conduct an evaluation of the dredging operations and/or implement operational changes, which may include a temporary slowdown or shutdown of dredging operations. In general, a slowdown and evaluation of operations would be required before shutdown, with shutdown being the operational change of last resort.
- If EPA does require a slowdown or shutdown of dredging operations, normal operations will resume when the TPCB concentration at the monitoring station in question is below 500 ng/L TPCBs for two consecutive days, or as otherwise allowed by EPA.

[1] Note also that the PCB concentration criterion discussed in Section 2.1.3 does not apply at the near-field station(s).

- At any time that either the Town of Halfmoon or the Town of Waterford is unable to obtain water supplies from the City of Troy, EPA may at its discretion require a slowdown or shutdown of dredging based on a single exceedance or multiple exceedances of 500 ng/L TPCBs at Lock 5, Stillwater, or Waterford. Unless EPA allows otherwise, the slowdown or shutdown would continue until PCB levels return below a level of 500 ng/L TPCBs for two consecutive days, or until both Halfmoon and Waterford are once again obtaining water from Troy.

2.2 DESIGN ANALYSIS AND ROUTINE CONTROL MEASURES AND BMPS

The final Phase 2 design for 2012 includes an evaluation and identification of the BMPs and other control measures to be implemented during that dredging season to reduce resuspension. This evaluation includes modeling of resuspension from dredging and associated in-river equipment, using the existing resuspension model and an attenuation factor (to account for attenuation downstream of the Thompson Island station), to estimate the resulting concentrations of PCBs in the water column at the Lock 5 and Waterford far-field monitoring stations and the extent to which they are predicted to exceed the Control Level PCB criteria described above at those stations. The 2012 FDR identifies the BMPs that that the Dredging Contractor will employ proactively on a routine basis during dredging operations in 2012 in an effort to meet the criteria in the Phase 2 Resuspension Standard.

2.3 ROUTINE MONITORING

GE will conduct routine monitoring at near-field and far-field stations in accordance with the Phase 2 RAM QAPP. This monitoring will be performed during dredging, debris removal, cap and backfill placement, and other in-river operations that have the potential for resuspending a significant amount of sediment. The sampling data will be compared to the criteria discussed in Section 2.1 to determine if an exceedance of any of those criteria has occurred.

A complete description of the routine resuspension monitoring program is included in Section 2 of the Phase 2 RAM QAPP.

2.4 CONTINGENCY MONITORING

In the event that the routine monitoring shows a TPCB concentration at or above 500 ng/L at a far-field monitoring station, GE will conduct the contingency monitoring specified for that situation in Section 2.4 of the Phase 2 RAM QAPP. In addition, if the routine monitoring at the Waterford station shows a TPCB concentration above 350 ng/L, sampling frequency at the Albany monitoring station in the Lower Hudson River will increase to weekly, as provided in Section 2.4 of the Phase 2 RAM QAPP. Further, if the routine monitoring at the Albany monitoring station shows a TPCB concentration (or concentrations) that require increased monitoring (or monitoring at the Mohawk River monitoring station) under criteria set forth in Section 2.4 of the Phase 2 RAM QAPP, GE will conduct such contingency monitoring. The

contingency monitoring will be continued until the conditions for reverting to routine monitoring are met, as also described in Section 2.4 of the Phase 2 RAM QAPP.

In addition, in the event the public water supplies of the Town of Halfmoon or the Town of Waterford are using Hudson River water during Phase 2 dredging in 2012, the far-field river water sampling during such period(s) will be revised to take into account the time of river travel, following the procedures described for such conditions in Section 2.4 of the Phase 2 RAM QAPP.

2.5 CONTINGENCY/RESPONSE ACTIONS

In the event that monitoring shows an exceedance of the criteria described in Section 2.1, contingency response actions may be required, as discussed below

2.5.1 Exceedance of TSS Advisory Level

In the event that the monitoring shows an exceedance of the Advisory Level for TSS concentrations, GE will discuss with EPA whether an evaluation should be conducted to assess the need for operational changes or other response actions. Such an evaluation, if warranted, may include one or more of the following action:

- Closer visual observations of dredging operations, including associated tug and other support vessel movements;
- Discussions with project personnel;
- Review of operations records; and/or
- Additional monitoring and/or sampling.

If one or more of the above investigative actions is (are) considered appropriate, GE will implement such action(s) upon EPA approval. Following this evaluation (if conducted), GE will further discuss with EPA whether operational changes or other response actions are warranted to address the TSS exceedance. In the event that, based on such discussions, it is determined that operational changes or other response actions are warranted, GE will implement such actions upon EPA approval.

2.5.2 Exceedance of Control Level for Tri+ PCB Net Loads

As described in Section 2.1.2, if monitoring shows an exceedance of the applicable 7-day average net Tri+ PCB load criteria (Control Level) for 14 or more consecutive days at the Lock 5 far-field station or 21 or more consecutive days at the Waterford station, EPA may require GE to conduct an evaluation of the dredging operations to assess the cause of the exceedance. If investigative measures are warranted to determine the cause of the exceedance, GE will propose such investigative measures to EPA. The selection of investigative measures will depend on specific project circumstances and may include, but are not limited to, the measures described above under TSS Advisory Level.

If the Control Level is exceeded as described above, EPA may require GE to evaluate potential engineering solutions to address the exceedance and to propose the implementation of an engineering solution, which may include slowdown of dredging operations. However, EPA may determine in some cases that no engineering solution is necessary to address the Control Level exceedance. The possible engineering solutions to be considered include the following, as indicated in the 2012 FDR:

- Adjusting the sequence/schedule of dredging, including dredging areas with a low potential for resuspending sediments (i.e., areas with low PCB concentrations and/or low velocity) at the same time as dredging in areas with high resuspension potential;
- Use of smaller equipment (i.e., equipment with shallower draft and less powerful engines);
- Refraining from dredging multiple highly contaminated areas at the same time;
- Implementation of contingent sheen control measures as needed;
- Restricting river flow in particular areas where practical; and
- Reducing the sediment removal rate (i.e., a slowdown of dredging operations).

In the event that EPA requires GE to evaluate potential engineering solutions, GE will begin by evaluating if the solution can be implemented through a refinement in operations or equipment that is consistent with, and would not require a modification of, the EPA-approved 2012 FDR or 2012 RAWP. If GE determines this to be the case, GE will consult with EPA and, if appropriate based on that consultation, will implement the solution. GE will document the implementation in the weekly progress report to EPA. If GE determines that the solution cannot be implemented through a refinement in operations or equipment that is consistent with, and would not require a modification of, the EPA-approved 2012 FDR or 2012 RAWP GE will commence an engineering evaluation in consultation with EPA. This engineering evaluation may include active field refinements in operations or equipment while continuing dredging operations. (As noted above, EPA may also require a slowdown, but not shutdown, of dredging operations in this situation.) GE will document any ongoing engineering evaluation in the weekly progress report to EPA. Once the engineering evaluation is complete, GE will prepare and submit to EPA an Engineering Evaluation Report. This report will contain the results of the engineering evaluation, the proposed engineering solution, and a proposed schedule for implementing that solution, if it has not already been implemented. If GE has not already implemented the solution, GE will implement the engineering solution in accordance with the EPA-approved Engineering Evaluation Report. If the cause of the exceedance was not identified by the engineering evaluation, the Engineering Evaluation Report will include a course of action for continued monitoring and evaluation to determine the cause of the exceedance. Alternatively, EPA may direct GE to implement a particular engineering solution after an engineering evaluation has been performed, subject to applicable provisions of the CD. GE will

consult with EPA on a regular basis until the cause and solution are determined, or until EPA determines that further evaluation is not necessary.

The time frames for completion of the engineering evaluations and implementation of engineering solutions (if any) will be variable, depending on the circumstances surrounding the exceedance. These time frames will be subject to EPA review. It is anticipated that engineering contingencies, if required by EPA, would begin as soon as possible so as to minimize PCB releases. As noted above, in the event that EPA requires a slowdown of dredging operations, GE will not resume normal operations until the daily Tri+ PCB load is below the 3 percent, 2 percent, or 1 percent daily net load criterion, as the case may be, for 2 consecutive days, unless EPA allows otherwise.

2.5.3 Exceedance of Control Level for TPCB Concentration

If monitoring shows an initial occurrence of a TPCB concentration equal to or above 500 ng/L, GE will promptly notify EPA, but no later than 24 hours after receipt of the data. If subsequent sampling confirms an exceedance of that level, GE will again promptly notify EPA, but no later than 24 hours after data receipt.

As discussed in Section 2.1.3, if the monitoring data show a confirmed exceedance of 500 ng/L TPCBs at Lock 5 or Waterford station or an exceedance of 500 ng/L TPCBs for five days out of any seven-day period at the Lock 5 monitoring station, EPA may require GE to conduct an evaluation of the dredging operations to assess the cause of the exceedance. If investigative measures are warranted to determine the cause of the exceedance, GE will propose such investigative measures to EPA. The selection of investigative measures will depend on specific project circumstances and may include, but are not limited to, the measures described above under TSS Advisory Level. If directed by EPA, such an evaluation of dredging operations will include an evaluation of all upstream operations and not only of the operations immediately upstream of the monitoring station where the exceedance was detected.

In addition, if an exceedance of 500 ng/L TPCBs occurs for any of the time periods specified in Section 2.1.3, EPA may require GE to evaluate potential engineering solutions to address the exceedance and to propose the implementation of an engineering solution. If the exceedance involves a confirmed exceedance of 500 ng/L TPCBs at the Lock 5 monitoring station, the engineering solutions to be considered include those listed in Section 2.5.2 (excluding a slowdown of dredging operations) and other BMPs that do not require GE to slow down or shut down the dredging operations. If the exceedance involves TPCB concentrations exceeding 500 ng/L at the Lock 5 monitoring station for five days out of any seven-day period or involves a confirmed exceedance of 500 ng/L TPCBs at the Waterford station, the engineering solutions to be considered include those listed in Section 2.5.2 (including a slowdown of

dredging operations) and, as a last resort, a temporary shutdown of dredging operations.[2]

In the event that EPA requires GE to evaluate potential engineering solutions GE will begin by evaluating if the solution can be implemented through a refinement in operations or equipment that is consistent with, and would not require a modification of, the EPA-approved 2012 FDR or 2012 RAWP. If GE determines this to be the case, GE will consult with EPA and, if appropriate based on that consultation, will implement the solution. GE will document the implementation in the weekly progress report to EPA. If GE determines that the solution cannot be implemented through a refinement in operations or equipment that is consistent with, and would not require a modification of, the EPA-approved 2012 FDR or 2012 RAWP GE will commence an engineering evaluation in consultation with EPA. This engineering evaluation may include active field refinements in operations or equipment while continuing dredging operations. (As noted above, EPA may also require a slowdown, or in certain circumstances a temporary shutdown, of dredging operations.) GE will document any ongoing engineering evaluation in the weekly progress report to EPA. Once the engineering evaluation is complete, GE will prepare and submit to EPA an Engineering Evaluation Report. This report will contain the results of the engineering evaluation, the proposed engineering solution, and a proposed schedule for implementing that solution, if it has not already been implemented. If GE has not already implemented the solution, GE will implement the engineering solution in accordance with the EPA-approved Engineering Evaluation Report. In general, as previously noted, an evaluation of operations and (if necessary) a slowdown of operations would be required before shutdown, with shutdown being the operational change of last resort. If the cause of the exceedance was not identified by the engineering evaluation, the Engineering Evaluation Report will include a course of action for continued monitoring and evaluation to determine the cause of the exceedance. GE will consult with EPA on a regular basis until the cause and solution are determined, or until EPA determines that further evaluation is not necessary.

The time frames for completion of the engineering evaluations and implementation of engineering solutions (if any) will be variable, depending on the circumstances surrounding the exceedance. These time frames will be subject to EPA review. It is anticipated that engineering contingencies, if required by EPA, would begin as soon as possible so as to minimize PCB releases. As noted above, in the event that EPA requires a slowdown or shutdown of dredging operations, normal operations will not resume until the TPCB concentration at the monitoring station in question is below 500 ng/L TPCBs for two consecutive days, unless EPA allows otherwise.

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[2] In addition, as noted above, at any time that either the Town of Halfmoon or the Town of Waterford is unable to obtain water supplies from the City of Troy, EPA may at its discretion require a slowdown or shutdown of dredging based on a single exceedance or multiple exceedances of 500 ng/L TPCBs at Lock 5, Stillwater, or Waterford. Unless EPA allows otherwise, the slowdown or shutdown would continue until PCB levels return below a level of 500 ng/L TPCBs for two consecutive days, or until both Halfmoon and Waterford are once again obtaining water from Troy.

2.6 REPORTING

In addition to the notifications and reporting described above in this section, GE will provide the data from the Resuspension Standard monitoring program to EPA as described below.

Continuous water column monitoring data and analytical results from water column samples will be made immediately available to EPA on a daily basis in the form of an electronic data export that can be downloaded from a secure website. The daily export will include all water column data uploaded to the project database over the last 24-hour period.

GE will submit weekly progress reports to EPA at weekly EPA-GE coordination meetings to be held throughout the 2012 dredging season. These reports will summarize any exceedances of the Resuspension Standard criteria, and any engineering evaluations conducted or engineering solutions or other corrective actions implemented.

Additional information regarding routine reporting associated with the Phase 2 Resuspension Standard, including the data management system, is included in Section 2 of the Phase 2 RAM QAPP.

Any Engineering Evaluation Reports, if required, will be submitted separately to EPA within a week of completion of the engineering studies reported thereon or on such other timetable as is proposed by GE and approved by EPA.

In addition, GE will provide monthly reports on the water column monitoring program as part of the Monthly Progress Reports pursuant to the CD. These monthly reports will provide information on monitoring activities and actions taken, but will not be the primary method of communicating monitoring data and information on exceedances to EPA.

Further, GE will provide an annual Data Summary Report (DSR) that documents the data collected in 2012 for the water column monitoring program. This report will be submitted by April 1, 2013. The DSR will fully document the 2012 work, including a summary of the monitoring performed, a tabulation of results, field notes, processing data, chain-of custody (COC) forms, copies of laboratory audits, data validation results, copies of laboratory reports, and a compact disc-read only memory (CD-ROM) version of the project database. As a result of the other routine reporting including daily and monthly reports, EPA will have all analytical results from the dredging period, shortly after dredging has been completed. This will assist EPA in review of the design documents for the 2013 season.

2.7 SPECIAL STUDY

During the 2012 season, GE will conduct a special study to evaluate the feasibility of using a buoy-based automated far-field station at Stillwater. This special study is described in detail in Section 9.2 of the Phase 2 RAM QAPP. The results of this study will be documented in a Data Summary Report (DSR), which will be provided to EPA in accordance with a schedule set forth in Section 9 of the Phase 2 RAM QAPP. The analytical data generated will be forwarded to EPA via an automated electronic mail system as described in the Phase 2 RAM QAPP.

SECTION 3

WATER QUALITY REQUIREMENTS FOR IN-RIVER RELEASES OF CONSTITUENTS NOT SUBJECT TO PERFORMANCE STANDARDS

This section discusses the Phase 2 WQ Requirements for in-river releases of constituents not subject to the EPS. As with the resuspension standard discussed above, the requirements discussed in this section are applicable to dredging and associated in-river operations. This section provides an overview of the substantive standards as set forth in the Hudson Phase 2 Substantive WQ Requirements (as defined in Section 1.1 above) and specifies the routine monitoring requirements, contingency monitoring and other responses in the event of an exceedance of an applicable standard or an observation of distressed, dying, or dead fish, and reporting requirements.

3.1 OVERVIEW OF WQ REQUIREMENTS

EPA, in consultation with the New York Department of Environmental Conservation (NYSDEC) and the New York Department of Health (NYSDOH), has specified water quality standards for in-river concentrations of a number of constituents, such as metals, that are not subject to the Hudson Phase 2 EPS. As EPA recognized in the Hudson Phase 2 EPS (p. 6-1) and the Phase 2 PSCP Scope (p. 7-1), the Phase 1 experience indicated that dredging operations did not significantly increase the concentrations of these constituents. This was confirmed by monitoring conducted during the first year of Phase 2 dredging in 2011. As result, the monitoring for the WQ Requirements has been modified for 2012. As discussed further below, GE will conduct weekly metals monitoring at the near-field transect for a four-week period at the beginning of the dredging in 2012; and if those results continue to show concentrations below the applicable standards, routine monitoring for metals will be discontinued for the remainder of the season. However, if there are indications of impacts from the dredging operations, such as fish kills, EPA may require additional monitoring. Continuous monitoring for pH and dissolved oxygen (DO) will continue to be performed at both the near- and far-field stations.

The WQ Requirements for in-river releases are divided into acute water quality standards, which apply to near-field stations, and health-based standards, which apply to far-field stations.

3.1.1 Aquatic Acute Water Quality Standards at Near-Field Stations

The Phase 2 WQ Requirements for near-field monitoring stations include aquatic acute standards for certain metals (some of which are dependent on the hardness of the water), which apply to the dissolved form of those metals. Hardness varies along the length of the project area and will result in a range of calculated standards. For example, based on limited available data, average hardness values from Corinth and Waterford range from 18 to 55 parts per million (ppm), respectively. The resulting ranges of water quality standards for metals are as follows (where applicable, the formulas for calculating the standards are in brackets):

- Cadmium – Aquatic Acute A(A): 0.6 micrograms per liter (µg/L) to 2.0 µg/L [(0.85) exp(1.128[ln (ppm hardness)] – 3.6867)]
- Lead – Aquatic Acute A(A): 14.4 µg/L to 50.4 µg/L [{1.46203 – [ln (hardness) (0.145712)]} exp (1.273 [ln (hardness)] – 1.052)]
- Chromium (total – Aquatic Acute A(A): 140 µg/L to 349 µg/L [(0.316) exp (0.819 ln (ppm hardness)) + 3.7256)]
- Chromium (hexavalent) – Aquatic Acute A(A): 16 µg/L
- Mercury – Aquatic Acute A(A): 1.4 µg/L

The WQ Requirements for near-field stations also include water quality standards for pH and dissolved oxygen (DO), as specified in New York Codes, Rules and Regulations (NYCRR) Title 6, Chapter X, Part 703.3. They are:

- pH must not be less than 6.5 nor more than 8.5;[3] and
- DO levels must not have a minimum daily average less than 5.0 mg/L and must not, at any time, be less than 4.0 mg/L.

In addition to these WQ Requirements, the New York water quality regulations contain a standard of no increase in turbidity that would "cause a substantial visible contrast to natural conditions" (6 NYCRR § 703.2). Although this standard was not included in the WQ Requirements issued by EPA for this project, GE and EPA (after consultation with NYSDEC) have agreed that this standard will be satisfied during the 2012 dredging season through application of a turbidity limit of 350 nephelometric turbidity units (NTU), as a 24-hour average measured at the near-field transect station downstream of dredging operations. However, a turbidity measurement above that level will be considered an exceedance of the standard only if a second 24-hour turbidity measurement confirms the initial 350 NTU exceedance. (This will be considered an Advisory Level; responses to a confirmed exceedance of that level are discussed at the end of Section 3.4.).

3.1.2 Health (Water Source) Standards at Far-Field Stations

The WQ Requirements for far-field monitoring stations establish health (water source) standards for certain metals, which apply to the total form of the metals and are not hardness dependent. When monitoring for these standards is conducted at a far-field station (as discussed below), the following health (water source) standards will apply:

- Cadmium (total): 5 µg/L
- Chromium (total): 50 µg/L
- Mercury (total): 0.7 µg/L

[3] For 2012, this standard will be applied to the average pH value over a 4-hour period (during which measurements will be recorded at 15-minute intervals).

- Lead (total): 15 µg/L (NYSDOH action level), with a "trigger level" of 10 µg/L at Stillwater and Waterford (as stated in 10 NYCRR Section 5-1.41)

An exceedance of these standards and NYSDOH action level will be deemed to occur if a concentration exceeding the standard/action level is measured in a single 24-hour composite sample.

3.2 ROUTINE MONITORING

As noted above, based on the experience and monitoring results from Phase 1 and Phase 2 Year 1, monitoring for metals has been modified for 2012. During the initial four weeks of dredging operations in 2012, GE will collect one 24-hour composite water sample from the near-field transect buoys once per week for analyses of disssoved and total cadmium and lead (as well as hardness) in accordance with the procedures described in the Phase 2 RAM QAPP. If these data show that the concentrations of dissolved cadmium and lead are substantially below the applicable aquatic acute standards (based on the criteria set forth in the Phase 2 RAM QAPP), routine monitoring for metals will be discontinued for the remainder of the 2012 season.

The monitoring program for compliance with the WQ Requirements will also include continuous measurements of pH, DO, temperature, conductivity, and turbidity at the near-field transect, as described in the Phase 2 RAM QAPP. Attainment of the aquatic acute standards for pH and DO will be determined based on the pH and DO results from the near-field monitoring station.

3.3 CONTINGENCY MONITORING

In the event that weekly metals monitoring (when conducted) shows an exceedance of an applicable aqutic acute standard at the near-field station, contingency monitoring will be conducted. In addition, if EPA determines that contingency monitoring for metals is necessary in response to observations of distressed, dying, or dead fish (see Section 3.5), such monitoring will be conducted as directed by EPA. This contingency monitoring will include, as necessary, analysis of near-field samples, in total and dissolved form, for all Target Analyte List (TAL) metals by EPA Method 200.8, plus mercury (by EPA Method 1631) and hexavalent chromium (by SW-846 Method 7196A). In addition, samples may be collected from a given far-field station for analysis of these same metals in total and/or dissolved form. The results from this monitoring will be compared with the applicable aquatic acute standards (for the near-field data) and the health (water source) standards and NYSDOH action level for lead (for the far-field data).

3.4 CONTINGENCY/RESPONSE ACTIONS

If monitoring conducted shows an exceedance of any of the aquatic acute or health (water source) standards (or the NYSDOH action level for lead), GE will promptly notify EPA and NYSDEC (and, for an exceedance of a health standard at a far-field station, the NYSDOH), but no later than 3 hours (for a near-field exceedance) or 24 hours (for a far-field exceedance) after

receipt of the laboratory data, and will make these laboratory data available to EPA, NYSDEC, and NYSDOH. In addition, GE will investigate the cause(s) of the exceedance, evaluate potential responses, and propose an appropriate response to EPA for approval. The selection of investigative measures will depend on specific project circumstances and may include one or more the following actions:

- Closer visual observations of dredging operations, including associated tug and other support vessel movements;
- Discussions with project personnel;
- Review of operations records; and/or
- Additional monitoring and/or sampling.

GE will consider and evaluate potential responses to the exceedance and propose an appropriate response to EPA. Such responses may include additional studies, increased monitoring, and/or implementation of engineering solutions. If engineering solutions are necessary, GE will consider, at a minimum, the same potential engineering solutions listed in Section 2.5.2 for exceedances of the Control Level for Tri+ PCB net loads.

In the event that EPA requires GE to evaluate potential engineering solutions, GE will begin by evaluating if the solution can be implemented through a refinement in operations or equipment that is consistent with, and would not require a modification of, the EPA-approved 2012 FDR or 2012 RAWP. If GE determines this to be the case, GE will consult with EPA and, if appropriate based on that consultation, will implement the solution. GE will document the implementation in the weekly progress report to EPA. If GE determines that the solution cannot be implemented through a refinement in operations or equipment that is consistent with, and would not require a modification of, the EPA-approved 2012 FDR or 2012 RAWP GE will commence an engineering evaluation in consultation with EPA. This engineering evaluation may include active field refinements in operations or equipment while continuing dredging operations. GE will document any ongoing engineering evaluation in the weekly progress report to EPA. Once the engineering evaluation is complete, GE will prepare and submit to EPA an Engineering Evaluation Report. This report will contain the results of the engineering evaluation, the proposed engineering solution, and a proposed schedule for implementing that solution, if it has not already been implemented. If GE has not already implemented the solution, GE will implement the engineering solution in accordance with the EPA-approved Engineering Evaluation Report. If the cause of the exceedance was not identified by the engineering evaluation, the Engineering Evaluation Report will include a course of action for continued monitoring and evaluation to determine the cause of the exceedance. GE will consult with EPA as necessary until the cause and solution(s) are determined, and will implement the solution(s) until the exceedances have been effectively mitigated, or until EPA determines that further evaluation is not necessary and the exceedances have ceased or have been effectively mitigated.

In addition, if a confirmed exceedance of the turbidity level above 350 NTU is measured at a near-field transect station, an exceedance of the Advisory Level for turbidity will be considered to have occurred. The response actions that GE will take in such a case are the same as those listed in Section 2.5.1 above for an exceedance of the Advisory Level for TSS.

3.5 RESPONSES TO OBSERVATIONS OF DISTRESSED, DYING, OR DEAD FISH

If, during in-water activities, distressed, dying, or dead fish are observed, GE will promptly notify EPA and NYSDEC. GE will also assess the cause(s) of the situation. Specifically, GE will take the following actions in the event that a distressed, dying, or dead fish is observed:

- Conduct a visual observation in the immediate vicinity of the first observed distressed or dying fish to identify if other distressed, dying, or dead fish are present.
- Document the location of the fish in relation to the nearest project-related activity.
- Identify the fish species involved.
- To the extent possible, examine the fish to see if a cause can be determined – e.g., to assess whether the cause was physical damage (partly eaten, hit by a propeller, hurt during angling catch and release, etc.) or deformities or disease (parasites, sores, tumors, etc.).
- If appropriate in the case of dead fish, collect additional dead fish to better support the determination of the cause of death.
- Document the occurrence, including observer's name, company affiliation, and qualifications or training, as well as the date, time, location, fish's condition and approximate size. Resume on-water activities and continue to look for additional distressed, dying, or dead fish in the area.
- After the initial notification is made to EPA and NYSDEC, document any additional facts that will be needed to support an evaluation of the occurrence.

The above investigation and evaluation steps will be conducted by a qualified individual.

If the cause for the distressed, dying, or dead fish can be determined and is project-related, GE will discuss with EPA the need for and scope of monitoring for metals and/or increased monitoring for the additional water quality parameters (i.e., ph, DO). If GE and EPA agree on such contingency monitoring, or if EPA otherwise so directs, GE will conduct that contingency monitoring in accordance with the parties' agreement or EPA's direction. In addition, GE will propose an appropriate response to EPA, following the same requirements and subject to the same qualifications specified in Section 3.4 for an exceedance of water quality standards.

3.6 REPORTING

GE will routinely report the analytical data from the monitoring program for the WQ Requirements during the 2012 dredging season in the same way as it reports the data from the

Resuspension Standard monitoring program, as described in Section 2.6 above. These reports will include daily electronic data exports, weekly reports, monthly reports, and an annual DSR, all as described in Section 2.6.

In addition, as noted above, GE will report any near-field exceedances of the aquatic acute standards to EPA and NYSDEC within 3 hours of receipt of the analytical data; and it will report any exceedances of the health (water source) standards or of the action level for lead to EPA, NYSDEC, and NYSDOH promptly, but no later than within 24 hours of receipt of the analytical data. Engineering Evaluation Reports will be submitted as described in Section 3.4. GE will promptly notify EPA and NYSDEC if distressed, dying, or dead fish are observed.

SECTION 4

RESIDUALS PERFORMANCE STANDARD

This section discusses the Phase 2 Residuals Performance Standard. It provides an overview of that standard as set forth in the Hudson Phase 2 EPS, and specifies the components of the standard, including verification of achievement of the design dredge elevation, sampling and analytical procedures for sediments following dredging, evaluation of the sampling data, the responses to be taken based on the sampling data, limits on capping, reporting procedures, and the special studies under this standard.

4.1 OVERVIEW OF STANDARD

The Hudson Phase 2 EPS (pp. 2-5 and 3-1) state that the primary objectives of the Phase 2 Residuals Standard are to:

- Achieve the design depth of contamination (DoC) elevation, also known as the elevation of contamination (EoC);
- Achieve an average residual concentration of no more than 1 mg/kg Tri+ PCBs, with subsequent backfilling, while minimizing the need for capping;
- Identify areas where capping or a second dredge pass is needed because the residual sediment arithmetic average Tri+ PCBs concentration is greater than 1 mg/ kg in the top six inches;
- Identify areas where a second dredge pass is needed because PCB inventory remains at depth or Tri+ PCB concentrations of greater than or equal to 27 mg/kg are present in surface sediments after the first pass is complete;
- Identify areas where post-dredging TPCB concentrations are greater than or equal to 500 mg/kg so these can be removed in an additional dredging pass (or a third pass if necessary);
- Discern and map the extent to which the EoC has been accurately identified and interpolated, as a basis to review the success of GE's application of the adjusted terrain model and other pertinent data to meet the limits on capping that are set forth below; and
- Provide data to evaluate the success of the remediation in attaining the true EoC and to provide a basis to adjust the design dredge elevation in subsequent CUs or portion thereof so as to minimize the number of passes and amount of non-target sediment removed.

With certain exceptions, defined below, GE has the discretion to establish design dredge elevations for each dredging pass so as to meet, in the way GE deems most efficient, the specified limits on the total extent of area that may be capped in Phase 2 and on the extent of

area that may be capped due to the presence of inventory (as defined above). Based on the descriptions in the Hudson Phase 2 EPS and the Phase 2 PSCP Scope and subsequent discussions with EPA, the key features of the Phase 2 Residuals Standard include the following:

- GE will establish design dredge elevations taking into account the results of the sediment re-coring efforts and uncertainty regarding the DoC. While EPA will not prescribe those elevations, GE's establishment of those elevations will need to take into account that there are specified limits on the allowable amount of capping, as discussed below.
- Dredging must be sufficient to achieve the design dredge elevation in at least 95 percent of each CU or pertinent portion thereof. GE will require the dredging contractor to inform GE of how the target dredge elevation is set in a CU or portion thereof and communicate that information to EPA.
- Once the dredge elevation requirement is met, sampling must be conducted to determine what PCB levels remain, both at the surface and at depth.
- Unless otherwise approved by EPA, a second dredging pass to a newly defined dredge elevation will be conducted at all nodes where inventory or elevated concentration residuals are found after the first pass. For this purpose, "inventory" means sediments containing a Tri+ PCB concentration equal to or greater than 6.0 mg/kg in any 6-inch segment of the post-dredging core other than the uppermost 6-inch segment, and "elevated concentration residuals" means sediments with a Tri+ PCB concentration equal to or greater than 27 mg/kg in the 0-6 inch segment.
- Those CUs or portions thereof with an average surface concentration, after dredging, of less than or equal to 1 mg/kg Tri+ PCBs and no inventory (as defined above) present can be backfilled.
- Exclusive of the nodes identified with inventory or elevated concentration residuals (as defined above), if, after the first dredging pass, one or more nodes in a CU or portion thereof have PCB concentrations in the top 6 inches which drive the average surface concentration of the CU or portion thereof above 1 mg/kg Tri+ PCBs, that node(s) must either be capped or redredged, at GE's discretion, subject to the capping limits described in Section 4.6 below. In addition, if the average surface Tri+ PCB concentration of the CU or portion thereof after the first dredging pass exceeds 1 mg/kg, GE may, at its discretion, redredge nodes that might, if not redredged, cause the surface concentration of the CU or portion to exceed 1 mg/kg Tri+ PCBs after the second pass.
- Where a second dredging pass is performed in a given location and the elevation requirement is demonstrated to have been achieved, sampling will be conducted to determine if the location will be capped, backfilled, or re-dredged. Capping, rather than backfill, is required in the event that: (1) the Tri+ PCB concentration in surface sediment (i.e., in the top 6 inches) at that node causes the average Tri+ PCB

concentration for the dredged area to exceed 1 mg/kg, (2) the Tri+ PCB concentration in surface sediment is greater than or equal 27 mg/kg, or (3) inventory is found to exist (i.e., concentrations of Tri+ PCBs are greater than or equal to 6 mg/kg in segments deeper than 6 inches). However, if the sample results show that TPCB concentrations equal to or greater than 500 mg/kg are present at any depth in that location after a second pass, a third dredging pass must be performed there to a newly defined dredge elevation. In addition, if any of the three above-listed conditions is present but there are no TPCB concentrations at or above 500 mg/kg, GE may, on a case-by-case basis, request EPA to allow the performance of a third dredging pass, rather than capping the area; and GE may conduct such a third dredging pass if EPA so approves.

- Special procedures, described below, must be followed in those dredging areas that exist in the navigation channel, to take account of the navigation requirements and maintenance dredging of the New York State Canal Corporation (NYS Canal Corporation).
- Special procedures, described below, must also be followed in shoreline dredging areas, to take account of shoreline stability considerations.
- There are specified limits on the total extent of area that may be capped in Phase 2 and on the extent of area that may be capped due to the presence of inventory (as defined above).

4.2 VERIFICATION OF ACHIEVEMENT OF DESIGN DREDGE ELEVATION

The design dredge elevations established for 2012 target dredge areas are specified in the 2012 FDR. Once dredging operations begin, the design dredge elevations may be adjusted to account for the results of the rip-rap and structural offset probing to be conducted by the dredging contractor, the results of additional sediment sampling conducted by GE, and any additional uncertainty adjustments deemed necessary by GE to achieve the specified limits on the allowable amount of capping. GE will provide any adjustments to the design dredge elevations to EPA. In addition, the dredging contractor will have discretion to determine the target depths or elevations of dredging cuts (including any necessary overcuts) to achieve the design dredge elevations, so long as the design dredge elevation is achieved in at least 95 percent of each CU or pertinent portion thereof. It is anticipated that the CU portions to be subject to such separate evaluation will be of varying sizes, typically approximately one-half of a CU. However, each CU portion to be separately evaluated will be no smaller than one acre in size unless otherwise approved by EPA.

Following completion of the initial dredging pass, GE will verify that the dredge elevation specified in the 2012 FDR has been achieved in 95 percent of each CU or portion thereof (accounting for exclusion areas detailed below). This verification will be based on comparing the average post-dredge elevation within each 10-foot by 10-foot grid cell with the corresponding design dredge elevation within the same cell. Grid cells with average post-dredge

elevations at or below the design dredge elevations will be deemed compliant and grid cells with average post-dredge elevations above the design dredge elevations will be deemed non-compliant. If more than 5 percent of the grid cells within a CU or portion thereof are non-compliant, GE will conduct an additional dredge pass over those areas as necessary to achieve the 95 percent requirement.

High-resolution (multibeam) bathymetric data will be used to establish the average post-dredge elevations whenever possible. In locations where obtaining high-resolution bathymetric data is not practical (e.g., in very shallow areas), other survey methods will be used, as described in the Dredging Construction Quality Control/Quality Assurance Plan (DQAP) (Appendix A to the RAWP).

Post-dredging bathymetry maps and grid electronic files will be provided to EPA for verification purposes as soon as they are completed. They will consist of the following:

- Maps and electronic files of post-dredging elevations, with maps prepared on 10-foot by 10-foot spacing outside of the near-shore areas (between elevations 117.5' and 119') and 1-foot by 1-foot spacing inside the near-shore areas and separate XYZ files submitted of the average elevations within 1-foot by 1-foot and 10-foot by 10-foot spaced grid cells; and
- Maps and electronic files of the difference between the post-dredging elevations and the design dredge elevations, with difference maps prepared on 10-foot by 10-foot spacing outside of the near-shore area- (between elevations 117.5' and 119') and 1-foot by 1-foot spacing inside the near-shore areas and separate difference XYZ files submitted of the average elevation differences within 1-foot by 1-foot and 10-foot by 10-foot spaced grid cells.

Where subsequent dredging passes are conducted to achieve a redefined design dredge elevation (based on samples collected after the prior dredging pass), such subsequent dredging passes will include an overcut below the estimated EoC to increase the likelihood of removing the actual EoC. The amount of that overcut will be determined by GE to manage uncertainty and meet the capping limits described in Section 4.6 below. After each such subsequent dredging pass, GE will verify that that redefined dredge elevation has been achieved in 95 percent of the CU or pertinent portion thereof, using the same procedures described above.

Areas containing Glacial Lake Albany Clay (referred to hereafter as clay) and bucket refusal areas (i.e., areas where deeper dredging is prevented by bedrock or other hard-bottom or rocky conditions) will be tracked; and when such areas are encountered above the design dredge prism elevation for a given 10-foot by 10-foot grid cell, they will be considered to have met the required elevations for that dredge pass and thus will be deemed compliant for the purposes of achieving the 95% criterion described above. Areas containing an observed debris layer (defined as a layer where the majority of the sediment consists of debris) at the required elevations will be

tracked to aid decision making. Clay areas, bucket refusal areas, and debris layer areas will be clearly indicated on elevation acceptance maps provided to EPA.

4.3 SAMPLING AND ANALYSIS REQUIREMENTS

Post-dredging cores will be collected upon the completion of each dredging pass and analyzed for both TPCBs and Tri+ PCBs. The sampling and analytical methods and requirements are discussed below

4.3.1 Sampling Grid

Post-dredging sampling in each CU will be conducted at the locations and frequency described in Section 4 of the Phase 2 RAM QAPP. In general, a CU will be sampled at 40 locations on a triangular grid with certain exceptions as described in the Phase 2 RAM QAPP. In addition to the grid locations, shoreline areas (as defined in Section 4 of the Phase 2 RAM QAPP) will be sampled every 80 feet along a transect parallel to the shoreline and approximately midway between the shoreline (the 119-foot contour in River Section 1) and the edge of the near-shore area (defined as the 117.5-foot contour in River Section 1 or the distance off-shore at which the stable slope surface developed for the first pass intersected the DoC surface offshore, as defined by the offshore nodes, whichever is further from shore). If, after the design dredge pass has been completed and debris layer areas have been identified in the field, it is determined that additional samples are needed in the debris layer areas, additional sampling will be conducted in those areas (in addition to the residual sampling grid), using the most appropriate of the sampling techniques described in Section 4 of the Phase 2 RAM QAPP. For the navigation channel, the post-dredging sampling grid will be arranged to obtain approximately one sample for every 1/8 acre of channel area in every CU that includes the navigation channel.

4.3.2 Sample Collection and Depth of Sampling

The residual sampling will use sample collection methods described in Section 4 of the Phase 2 RAM QAPP. Residual sediment samples will be collected via coring, using vibracoring or other techniques described in that section of the Phase 2 RAM QAPP. Where difficult conditions (such as shallow bedrock) occur, sediment samples will be collected with small ponar samplers, following the protocols for such sampling presented in the Phase 2 RAM QAPP. In areas containing a debris layer or other areas where adequate samples cannot be collected using vibracoring or manual coring techniques, cores may be collected by other methods (as described in the Phase 2 RAM QAPP). Post-dredging samples will be collected promptly once the design dredge elevation has been achieved in 95 percent or more of a CU or portion thereof, but prior to the placement of any cover.

Post-dredging cores will be collected to target depth of 7 feet or core refusal in accordance with Section 4 of the Phase 2 RAM QAPP, and will be sectioned into 6-inch segments. After the initial dredging pass, the top 6 feet of each cores will be processed, andall available core segments from the top 4 feet will be sent to laboratory for analysis, with the remaining segments from the top 6 feet (if any) archived at GE's storage facility. After a re-dredging pass, the top

4 feet of each core will be processed and all available core segments from that 4 feet will be sent to the laboratory, with the remainder of the core discarded. In both cases, the laboratory will initially analyze segments from the top 2 feet and hold the next 2 feet for analysis if needed to define the DoC. The DoC will be considered to be defined if there is a minimum of two contiguous 6-inch core segments with TPCB concentrations less than 1.0 mg/kg. If two contiguous 6-inch segments with TPCB concentrations less than 1.0 mg/kg are not found within the top 2 feet, additional sections will be analyzed to 4 feet. If two contiguous 6-inch segments with TPCB concentrations less than 1.0 mg/kg are not found within the top 4 feet, the additional archived segments will be provided to the laboratory for analysis to the extent they are available. In the event that two contiguous 6-inch segments with TPCB concentrations less than 1.0 mg/kg are still not found, one such segment may be used to define the DoC upon approval by EPA. If EPA does not so approve, an additional, deeper core would be collected and analyzed as necessary to define the DoC.

In situations where the original core did not penetrate the full depth of the contaminated layer and results in two contiguous "clean" segments, GE and EPA will consider alternate coring techniques, including use of test pits, on a case-by-case basis, and will jointly agree on use of such alternate methods, if necessary, after reviewing surrounding cores, information obtained during dredging, historical information at the coring location, and availability of resources. If EPA and GE cannot agree on an alternate coring technique, EPA will decide what method will be utilized.

4.3.3 Sample Analysis

Sediment samples will be extracted and analyzed using the analytical methods specified in Section 4 of the Phase 2 RAM QAPP. The analytical results will be used to determine the required response actions, as described below.

4.4 EVALUATION OF SAMPLING DATA

The sediment sampling data will be evaluated after each dredging pass, incorporating all data collected up to that time. The analytical results for TPCBs will be converted to Tri+ PCBs using the procedure described in the Phase 2 RAM QAPP. Following the initial dredging pass, the data will be used to characterize the nodes of the CU or pertinent portion thereof into one of the following five categories:

- One or more nodes contain inventory, defined as sediments below 6 inches that contain Tri+ PCB concentrations greater than or equal to 6.0 mg/kg;
- Tri+ PCB concentrations in the 0-6 inch segment at any node are 27 mg/kg or above (referred to as "elevated concentration residuals");
- TPCB concentrations greater than or equal to 50 mg/kg are present at a shoreline node;

- Residual concentrations are present that cause the average surface (i.e., top 6-inch) concentration of all nodes, excluding those with inventory or elevated concentration residuals (as defined above), to exceed 1 mg/kg Tri+ PCBs.; or
- Residual concentrations are present that do not cause the average surface concentration of all nodes, excluding those with inventory or elevated concentration residuals, to exceed 1 mg/kg Tri+ PCBs (i.e., that average is less than or equal to 1 mg/kg Tri+ PCBs).

Nodes that fall within the fourth or fifth category will be evaluated as a group for the CU or portion thereof, using averaging procedures that incorporate all data collected up to that time, as described in Section 3.3.3 of the Hudson Phase 2 EPS. For purposes of comparing the average post-dredge surface concentration to the residuals criterion of 1 mg/kg, the data will be expressed as whole numbers, such that an average concentration up to 1.49 mg/kg will be considered, after rounding, to meet the 1 mg/kg criterion.

Individual nodes in the fifth category, except those with inventory or elevated residual concentrations, will be backfilled. If the average surface concentration in the CU or portion thereof exceeds 1 mg/kg Tri+ PCBs, then those nodes which drive the average surface Tri+ PCB concentration above 1 mg/kg will be selected (starting with the highest concentration node) and will be capped or redredged at GE's discretion (subject to the capping limits described in Section 4.6 below). The other nodes in the CU or portion, which have an average Tri+ PCB surface concentration equal to or less than 1 mg/kg, will be backfilled, unless GE in its discretion decides to redredge one or more of those nodes because the node(s) might, if not redredged, cause the surface concentration of the CU or portion to exceed 1 mg/kg Tri+ PCBs after the second pass.

Unless otherwise approved by EPA, nodes in the first category (inventory nodes), the second category (Tri+ PCBs ≥27 mg/kg), and the third category (TPCB ≥ 50 mg/kg in a shoreline node), will be redredged. The EoC at each such location will be reestablished and the area redredged. Where GE conducts a re-dredging pass, upon completion of that dredging pass to the revised EoC and the achievement of this elevation in 95% or more of the redredged area, all redredged locations will be resampled (to the depths described in Section 4.3.2).

The evaluation of sample data will take place after every dredging pass and incorporate all data collected up to that point in time, as described in Section 3.3.3 of the Phase 2 EPS. If the combined sampling results after the second dredging pass show a residual average Tri+ PCB concentration in surface sediments less than or equal to 1 mg/kg (and no inventory or elevated concentration residuals, as defined above, are present), final backfill will be placed. If the sampling results show (a) an average Tri+ PCB concentration in surface sediments in the CU (or portion thereof) greater than 1 mg/kg, or (b) a Tri+ PCB concentration in surface sediment greater than or equal to 27 mg/kg, or (c) the presence of inventory (i.e., concentrations of Tri+ PCBs greater than or equal to 6 mg/kg in segments deeper than 6 inches), then the area

containing the non-compliant nodes (i.e., those that drive the CU or CU portion average above 1 mg/kg or contain the elevated concentration residuals or inventory) will be capped (subject to the capping limits described in Section 4.6 below) or, if GE obtains EPA approval on a case-by-cases basis, may be redredged in a third dredging pass. However, if the sampling results show that TPCB concentrations greater than or equal to 500 mg/kg are present at any depth at any location after a second dredging pass, the EoC will be reestablished and a third pass will be performed to the newly defined dredge elevation and the foregoing post-dredge procedures repeated, unless directed otherwise by EPA.

Further details on the various response actions to be taken based on the results of residual sediment sampling are described in Section 4.5 below.

4.5 REQUIRED RESPONSE ACTIONS

This section describes in greater detail (in Section 4.5.1) the various response actions to be taken based on the sediment sample analytical results obtained. These responses apply after the initial dredging pass, as well as after subsequent dredging passes if needed, as described in Section 4.5.1. This section also discusses, in Section 4.5.2, the determination of the extent of the area to be capped (when capping is warranted). The limits on capping are discussed separately in Section 4.6.

4.5.1 Description of Response Actions

Response 1: Apply backfill within the CU or portion thereof.

Following the first dredging pass, this response will be taken if, in the CU or portion thereof: (a) the arithmetic average Tri+ PCB concentration of the top 6-inch segments is less than or equal to 1 mg/kg; (b) there is no remaining inventory (as defined above); and (c) there are no residual surface Tri+ PCB concentrations greater than or equal to 27 mg/kg. After the second (or a later) pass, this response may be taken in the CU or portion thereof if: (a) the arithmetic average Tri+ PCB concentration of the top 6-inch segments is less than or equal to 1 mg/kg; and (b) there are no nodes with TPCB concentrations exceeding 500 mg/kg. There must be at least three adjacent compliant nodes to define a backfill area and at least five nodes in a CU portion, excluding nodes containing inventory or surface Tri+ PCB concentrations greater than or equal to 27 mg/kg, to support evaluation of that portion as a single entity. Otherwise, the CU portion will be combined with at least one adjacent CU portion for calculation of the arithmetic average and application of the criteria described above. Once a compliant backfill area has been identified, GE may commence placement of backfill materials in any portion of that area that is upstream of any remaining re-dredge areas.

Response 2: Cap the node(s) that cause(s) the arithmetic average of the CU or portion thereof to be greater than 1 mg/kg Tri+ PCB or that contain inventory.

Following the first dredging pass, this capping response may be taken if, in the CU or portion thereof, the arithmetic average Tri+ PCB concentration of the top 6-inch segments is

greater than 1 mg/kg, provided that there is no remaining inventory (as defined above) and no residual surface Tri+ PCB concentrations greater than or equal to 27 mg/kg.

Following the second dredging pass, this response may be taken in the CU or portion thereof if: (a) there are nodes containing inventory (as defined above); and/or (b) the arithmetic average Tri+ PCB concentration of the top 6-inch segments (excluding any nodes to be redredged) is greater than 1 mg/kg; except this response may not be taken at any nodes where TPCB concentrations equal or exceed 500 mg/kg at any depth – which is covered by Response 7 below.

When this response is warranted, the nodes to be capped (i.e., the nodes whose values cause the Tri+ PCB average to exceed 1 mg/kg or the nodes containing inventory that may be capped) will be identified, and the area to be capped will be defined, bounded by the edges of the CU or edge of the shoreline area, whichever is closer, or a perimeter line connecting the compliant node locations, as described in Section 4.5.2. The type of cap will be based on the location in the river (high velocity/low velocity area), the post-dredging average concentration, and/or the individual node concentrations, as described in the 2012 FDR. If different caps are required for adjacent high and low concentration non-compliant residual nodes, the cap design for the high concentration residual nodes will extend to the perimeter defined by the low residual nodes. EPA approval for the cap design will then be obtained. Following EPA approval of the cap design, a subaqueous cap will be constructed over the identified cap area. Once a cap area has been approved by EPA, GE may commence placement of cap materials in any portion of that area that is upstream of any remaining re-dredge areas.

Any caps placed in this response are subject to the capping limits described in Section 4.6 below.

Response 3: Redredge missed inventory, residual surface concentrations greater than or equal to 27 mg/kg Tri+ PCB, and/or residual concentrations after the first dredging pass.

This response addresses four potential redredging conditions in a CU or portion thereof after the first dredging pass:

- Shoreline offset (3:1 slope): – i.e., the TPCB concentration is greater than or equal to 50 mg/kg at one or more shoreline locations (mandatory removal);
- Missed PCB inventory – i.e., the Tri+ PCB concentration in samples below 6 inches is greater than or equal to 6.0 mg/kg (mandatory removal unless otherwise approved by EPA);
- Elevated residual sediment contamination – i.e., the Tri+ PCB concentration at one or more residual locations is greater than or equal to 27 mg/kg in the top 6 inches but Tri+ PCB concentrations below 6 inches are less than 6.0 mg/kg (mandatory removal unless otherwise approved by EPA); and
- Noncompliant residual nodes, excluding nodes with identified inventory or residual surface concentrations greater than or equal to 27 mg/kg Tri+ PCBs, which cause the

arithmetic average of the top 6" segments of the CU or portion thereof to exceed 1 mg/kg Tri+ PCB. These nodes may be selected for a second dredging pass at GE's discretion (discretionary removal).

In each of these cases, the nodes to be redredged will be identified, and the area and prism to be redredged will be designed, bounded by the edges of the CU or a perimeter line connecting the surrounding node locations not slated for dredging or as otherwise approved by EPA on a case-by-case basis. The DoC for removal at each location will be established based on the depth of contamination in each core. Thiessen polygons will be used to extrapolate the DoC outward between adjacent nodes to be dredged. When a node to be dredged is adjacent to nodes not slated for removal, the dredge prism will be extended to the periphery of nodes not being dredged or as otherwise approved by EPA on a case-by-case basis.

The designed dredge prism will then be dredged, the new bathymetry will be incorporated into the compliant areas of the CU or portion thereof and re-verified at a 95 percent level of compliance (as was done for the first pass), and the dredged locations will be resampled. The data set for the entire CU or portion thereof will then be evaluated for further response actions, as discussed in other portions of this section.

Response 4: Redredge missed inventory or residual concentrations in the navigational channel after the first dredging pass.

This response addresses the mandatory redredging in the navigation channel after the first dredging pass. It applies to the following conditions:

- Missed PCB inventory – i.e., the Tri+ PCB concentration in samples below 6 inches is greater than or equal to 6.0 mg/kg (mandatory removal);
- Elevated residual sediment contamination – i.e., the Tri+ PCB concentration at one or more residual locations is greater than or equal to 27 mg/kg in the top 6 inches but Tri+ PCB concentrations below 6 inches are less than 6.0 mg/kg (mandatory removal); and
- Neither of the above two conditions is met but one or more nodes in the navigation channel cause the average Tri+ PCB concentration in the CU to exceed 1 mg/kg and the water depth in the channel is less than 15 feet below the minimum pool elevation (as defined below) (mandatory removal).

If nodes in an area of the navigation channel meet either of the first two conditions above, a second dredging pass will be performed at the non-compliant nodes to a depth that will allow the placement of a high velocity cap (that is, a depth such that there will be at least 14 feet of draft above the cap at the minimum pool elevation) or to the re-defined EoC, whichever is deeper. If the water depth after the first pass in an area of the navigation channel is less than 15 feet below the minimum pool elevation and nodes in the channel meet the third condition, GE will perform a second dredging pass at those nodes to a depth that will allow the placement of a high velocity cap or to the re-defined EoC, whichever is deeper, with the following exception: If, on a case-

by-case basis, GE shows that, based on the sampling data, redredging will achieve an average Tri+ PCB concentration at or below 1 mg/kg at a depth shallower than 15 feet such that a cap will not be necessary, GE may request EPA to allow redredging to that depth and, with EPA approval, may conduct redredging to that depth. If the water depth after the first pass in an area of the navigation channel is greater than or equal to 15 feet below the minimum pool elevation, post-dredging results for the navigation channel will be evaluated according to the same rules that apply elsewhere in the CU.[4]

The boundaries of the area to be redredged in channel areas will be defined by the CU boundary or the perimeter of compliant cores or as otherwise approved by EPA on a case-by-case basis. To the extent that the dredge prism associated with a channel node extends beyond the channel, the area outside the channel will not be redredged unless data outside the channel support re-dredging. In the latter case, additional removal will be conducted, as needed, to create stable slopes to the required elevation in the channel area.

No backfill will be placed in the navigation channel resulting in less than 14 feet of draft at the minimum pool elevation after placement, with the exception that, at nodes where the Tri+ PCB concentration exceeds 1 mg/kg in the surface but does not cause the average Tri+ PCB concentration in the CU to exceed 1 mg/kg or meet the other above-listed mandatory conditions for redredging, backfill will be placed so long as there is approximately 12 feet of draft at the minimum pool elevation after placement. If capping is necessary in the navigation channel, its design and implementation will be such that the top of the cap allows for a minimum of 14 feet of draft at the minimum pool elevation.

The minimum pool elevation for Thompson Island Pool is defined as 117.2 ft (NAVD88), which is equivalent to the crest elevation of the nearest downstream dam (Thompson Island Dam). Therefore, the river bottom elevation related to a water depth of 14 feet at the minimum pool elevation is 103.2 ft (NAVD88), the river bottom elevation related to a water depth of 15 feet at the minimum pool elevation is 102.2 ft (NAVD88), and the river bottom elevation related to a water depth of 12 feet at the minimum pool elevation is 104.2 ft (NAVD88).

Where redredging is necessary in the navigation channel, the nodes to be redredged will be identified, and the EoC for removal will be set at each location based on the DoC in each core, with an appropriate adjustment for uncertainty. Thiessen polygons will be used to extrapolate the DoC outward between adjacent nodes to be dredged and limited by the extent of the channel as defined by the NYS Canal Corporation. When a node to be dredged is adjacent to nodes not slated for removal, the dredge prism will be extended to the periphery of nodes not being dredged or as otherwise approved by EPA on a case-by-case basis, but limited to the extent of

[4] All of these cases assume that the dredging efforts do not encounter bucket refusal or clay. If dredging efforts do encounter bucket refusal or clay, EPA will be notified, and dredging will continue to the target elevation or to the bucket refusal or clay surface (whichever is shallower).

the channel as defined by the NYS Canal Corporation. Any second dredging pass (or a third dredging pass if approved by EPA) will include a dredging overcut, as described in Section 4.2.

The designed dredge prism will then be dredged, the new bathymetry will be incorporated into the compliant areas of the CU or portion thereof and re-verified at a 95 percent level of compliance (as was done for the first pass), and the dredged locations will be resampled. The data set for the entire CU or portion thereof will then be evaluated for further response actions, as discussed in other portions of this section.

Response 5: Redredge shoreline locations with TPCB concentrations greater than or equal to 50 mg/kg.

This response will be taken after the first pass if the sampling data from a shoreline area show sediments with a TPCB concentration greater than or equal 50 mg/kg at one or more shoreline locations at any depth.

In this situation, the nodes to be redredged will be identified, and the area and prism to be redredged will be designed, bounded by the shoreline or the edge of the CU and a perimeter line running perpendicular to shore at the adjacent upstream and downstream compliant node locations. The water side boundary of the shoreline area will be the off-shore limit of the near-shore area (defined as the 117.5-foot contour line in River Section 1) or the distance off-shore at which the stable slope surface developed for the first pass intersected the DoC as directly measured by the bounding cores (adjusted for uncertainty), whichever is further from shore. If compliant residual nodes exist off-shore, these will be used as a perimeter if that serves to reduce the extent of redredging.

The EoC for removal will be set at each location based on the DoC in each core (accounting for uncertainty and anticipated local variability in the DoC estimate), unless otherwise approved by EPA. Thiessen polygons will be used to extrapolate the DoC outward between adjacent nodes to be dredged. When a node to be dredged is adjacent to nodes not slated for removal, the dredge prism will be extended to the periphery of nodes not being dredged or as otherwise approved by EPA on a case-by-case basis, except where limited laterally as defined above.

The designed dredge prism will then be dredged, the new bathymetry will be incorporated into the compliant areas of the overall CU or portion thereof and re-verified at a 95 percent level of compliance (as was done for the first pass), and the dredged locations will be resampled. The data set for the entire CU or portion thereof, including the shoreline area, will then be evaluated for further response actions, as discussed in other portions of this section.

EPA and GE field representatives will review the shoreline stability adjacent to shoreline re-dredge locations on a case-by-case basis; and based on this review, GE may propose changes to shoreline re-dredge elevations to minimize disturbance of the shoreline, subject to EPA review and approval.

Response 6: Debris layer, bucket refusal, or clay encountered.

If a debris layer (defined as a layer in which the majority of the sediment consists of debris) is still encountered at the design dredge elevations, the dredging contractor will inform the CM, who in turn will inform EPA. Based on the CM's visual confirmation that debris is still present at the design dredge elevations, the dredging contractor will mark those bucket locations as debris buckets using the dredge bucket positioning system and will continue to dredge the area to the design dredge elevations, marking any bucket where the debris layer is still encountered at the design dredge elevations. Once dredging to the design dredge elevation is complete in a CU and the debris areas have been reviewed (using the dredging contractor's bucket files), residual cores will be collected as needed in the debris layer areas (in addition to the regular residual sampling grid), using the most appropriate of the sampling techniques described in Section 4 of the Phase 2 RAM QAPP.

The cores from the debris layer areas will then be tested for PCB contamination following the prescribed approach given in Section 4.3, and the results from these nodes will be evaluated according to the criteria described above. These criteria will include the requirement to have two contiguous 6-inch segments with TPCB concentrations less than 1.0 mg/kg to define the DoC, with the exception that if two such contiguous segments are not found in the original core, GE may request, and EPA may approve, the use of one such segment to define the DoC. If the evaluation of the data from the debris area cores shows that (a) based on the PCB data from the debris, additional dredging is not necessary or can stop at a depth within the debris layer or shallower than 6 inches below the bottom of the debris layer, and (b) the 6-inch segment immediately below the bottom of the debris has a TPCB concentration less than 1 mg/kg, then GE may apply the results in accordance with the above criteria. However, if the results show that the PCB contamination is associated with the debris layer or if the 6-inch segment below the bottom of the debris has a TPCB concentration at or above 1 mg/kg, GE will instruct the dredging contractor to dredge to a depth below the bottom of the debris layer.

If bucket refusal due to the presence of bedrock or other hard bottom or rocky conditions preventing deeper dredging is encountered at or above the target dredging depth (including in the navigation channel), the dredging contractor will inform the CM, who in turn will inform EPA. The CM and EPA representatives will meet on the dredge in question and review the dredging conditions (if EPA representatives are unavailable, the CM will review the dredging conditions alone). If bucket refusal is confirmed (through visual observations of rock material or inability to obtain material in the dredge bucket and/or physical observations of the dredge being unable to penetrate the sediment) by the CM, the dredging contractor will continue to dredge the area using the bucket refusal procedure identified in the 2012 FDR. The choice of cap or backfill will be based on the concentrations found in the bucket refusal area in conjunction with the rest of the data from the CU in accordance with the criteria discussed above, or as directed by EPA if samples cannot be obtained. However, in bucket refusal areas in the navigation channel, placement of backfill will be subject to the following: (a) Backfill will not be placed over nodes

with a surface Tri+ PCB concentration of 1 mg/kg or less if the post-dredging water depth is less than 14 feet ; (b) backfill will be placed over nodes where the surface Tri+ PCB concentration exceeds 1 mg/kg, but does not cause the average Tri+ PCB concentration in the CU to exceed 1 mg/kg, if the post-dredging water depth is approximately 12 feet or more but not if it is less; and (c) in other cases where backfill would otherwise be required in accordance with the applicable criteria, GE will discuss with EPA the need for and extent of backfill.

If a clay layer is encountered at or above the target dredging depth, the dredging contractor will inform the CM, who in turn will inform EPA. The CM and EPA representatives will meet on the dredge in question and review the dredging conditions (if EPA representatives are unavailable, the CM will review the dredging conditions alone). If clay is confirmed (through visual observations of clay material adhering to or smearing the dredge bucket and/or observations of bucket shaped material leaving the dredge bucket) by the CM, the dredging contractor will continue to dredge the area using the clay procedure identified in the 2012 FDR. . In isolated cases, an evaluation of remaining PCB mass may be conducted in order to understand whether a cap instead of redredging is logical given the potentially limited returns and of redredging low PCB mass nodes in clay or bucket refusal areas. The choice of cap or backfill will be based on the concentrations found in the clay area in conjunction with the rest of the data from the CU in accordance with the criteria discussed above, or as directed by EPA if samples cannot be obtained. However, in clay areas in the navigation channel, placement of backfill will be subject to the same rules described in the prior paragraph for bucket refusal areas in the navigation channel.

Verification of dredged elevations in debris, bucket refusal, and clay areas is addressed in Section 4.2 above.

The dredge bucket records obtained by the dredging contractor in debris layer, bucket refusal, and clay areas will define those areas for the purpose of the residual standard. GE and EPA will each day jointly review the records for the previous dredging day to ensure that agreement regarding those areas is obtained on a timely basis. In the event that GE and EPA are unable to agree regarding specific areas, EPA may request GE to take additional "test" buckets in the areas of disagreement. It is anticipated that "test" buckets will be used on rare occasions. In the identification of locations capped due to the presence of exposed bedrock or exposed clay, EPA in its sole discretion will determine the final categorization of any specific node.

Response 7: Redredge high concentrations after two passes.

This response addresses the mandatory redredge condition in which two dredging passes have been completed but TPCB concentrations at one or more locations still equal or exceed 500 mg/kg at any depth.

In this situation, the nodes to be redredged will be identified, and the area and prism to be redredged will be designed, bounded by the edges of the CU or a perimeter line connecting the surrounding node locations not slated for dredging or as otherwise approved by EPA on a case-

by-case basis. The EoC for removal will be set at each location based on the DoC in each core, with an appropriate adjustment for uncertainty. As discussed above, establishment of the DoC in each core will require two contiguous 6-inch segments with TPCB concentrations less than 1.0 mg/kg, with the exception that if two such contiguous segments are not found in the original core, GE may request, and EPA may approve, the use one such segment to define the DoC (see Section 4.3.2 above). Thiessen polygons will be used to extrapolate the DoC outward between adjacent nodes to be dredged. When a node to be dredged is adjacent to nodes not slated for removal, the dredge prism will be extended to the periphery of nodes not being dredged or as otherwise approved by EPA on a case-by-case basis. Any such redredging pass will include a dredging overcut, as described in Section 4.2.

The new bathymetry will be incorporated into the compliant areas of the CU or portion thereof and re-verified at a 95 percent level of compliance (as was done for the earlier passes), and the dredged locations will be resampled. The data set for the entire CU or portion thereof will then be evaluated for backfilling or capping in accordance with the relevant criteria discussed above.

In addition, if the data after a second dredging pass show an average Tri+ PCB concentration for the dredged area above 1 mg/kg or a Tri+ PCB concentration in surface sediment greater than or equal to 27 mg/kg or the presence of inventory, but no TPCB concentrations at or above 500 mg/kg, GE may request EPA to allow the performance of a third dredging pass, rather than capping the area; and it may conduct such a third dredging pass if EPA so approves. In that case, the procedures discussed above regarding a third dredging pass will be followed.

Response 8: Dredging in Cultural Resource and Structural Offset Areas.

This response addresses those areas where the ability to dredge is significantly limited or entirely precluded due to the presence of cultural resources or structural offsets. These areas will be addressed and evaluated individually. The 2012 FDR will identify off-sets and stable slope cuts from cultural resources and structures that are required to maintain the integrity and stability of such features. Further, if stability concerns are encountered during dredging adjacent to the off-set, the dredging contractor will inform the CM, who in turn will inform EPA. The CM and EPA will review the dredging conditions and determine if dredging should continue.

4.5.2 Extent of Area to be Capped

Locations to be capped will be identified as described above, based on the presence of PCB inventory or residual surface (0-6 inch) concentrations that require capping. Both types of locations are considered non-compliant. The area associated with non-compliant nodes will extend to the periphery of surrounding compliant nodes or to the edge of the CU. The handling of adjacent residual and inventory non-compliant nodes is discussed in the response actions described in Section 4.5.1 above.

Where a compliant node is surrounded by non-compliant nodes, the area associated with the compliant node will be capped as well. Generally, three compliant nodes arranged in a triangle are required to define an area that does not require capping. Two adjacent compliant nodes can also define an area not needing capping if they are both adjacent to the CU boundary. For locations where a single non-compliant node is surrounded by compliant nodes, the non-compliant node will be capped to a perimeter line formed by connecting the surrounding compliant nodes.

4.6 LIMITS ON CAPPING

As part of the Phase 2 EPS, EPA has established limits on the amount of capping that will be allowed in Phase 2 of the RA. The limits provide that the total area capped may not exceed 11 percent of the total area dredged during Phase 2, and that, within that limit, the total area capped due to the presence of inventory (i.e., Tri+ PCB contamination greater than or equal to 6.0 mg/kg in a segment below the top 6-inch segment) may not exceed 3 percent of the total area dredged during Phase 2. These two percentage limits are referred to as the "Percentage Capping Limits." Capping in the following types of areas will not count against the Percentage Capping Limits:

(1) Locations capped due to structural offsets;

(2) Locations capped due to the presence of cultural resources;

(3) Locations capped in shoreline areas;

(4) Locations capped due to bucket refusal (as defined above); and

(5) Locations capped due to the presence of clay.

To implement these Percentage Capping Limits during the 2012 dredging, the following procedures will be followed in 2012:

4.6.1 Tracking the Extent of Capping

As part of the evaluation and closure of each CU and pertinent portion, GE will track the amount of area and the number of nodes subject to the various treatments by CU and portion thereof. In order to facilitate the timely tracking of the extent of backfilling and capping in the field, the post-dredging sampling locations (i.e., nodes) will be used in an area-weighted nodal index (referred to as the Nodal Capping Index) as a surrogate for the exact extent of capping and backfilling.

For tracking purposes, the post-dredging surfaces and nodes will be categorized first as to their level of compliance with the Residual Standard criteria and then as to the areas of the river in which they fall. The levels of compliance will be as follows:

(a) Inventory capped in place (i.e., the node contained sediment below 6 inches containing Tri+ PCB concentrations equal to or greater than 6 mg/kg);

(b) Elevated residuals capped (i.e., the node caused the average surface concentration in the CU or portion thereof to exceed 1 mg/kg Tri+ PCB or had a surface concentration of 27 mg/kg Tri+ PCB or greater); and

(c) Compliant areas backfilled (i.e., the node was part of a CU or portion thereof whose average Tri+ PCB concentration was 1 mg/kg or less).

Compliant nodes that would not require capping by themselves but are capped because they are surrounded by capped nodes and would not meet the requirement that there be at least 3 adjacent compliant nodes to define a backfill area will not be counted as capped nodes for purposes of the capping limits, but will be considered compliant nodes.

For informational purposes, the post-dredging areas will also be categorized by river bottom type into one of the five above-listed categories of areas that are excluded from the capping limits or as an area that does not fall into one of those categories (category 6). For the purposes of the area-based reporting, the remedial area that falls into each of those six river bottom classes, further broken down into one of the three compliance levels, will be compiled by CU and then summarized to document the cumulative disposition of the remediated areas. The areas associated with categories 4 and 5 above will be based upon the field-delineated areas agreed upon by GE and EPA following the process described in Section 4.5.1 above.

4.6.2 Nodal Classification

In addition to the area compilation, the outcome of the individual nodes will be tracked for use in the calculation of the Nodal Capping Index. The nodes will be classified according to the same categories for the area tabulation given above. Nodes located within cultural off-set, structural off-set, and shoreline areas will be assigned strictly in accordance with the location of the node. All other nodes will be classified according to the majority river-bottom classification within a 40-foot radius of the final post-dredging node locations. For the purposes of nodal classification, categories 4 and 5 above will be considered one category and summed together in assessing the area inside the 40-foot radius. Thus, for all nodes not in categories 1, 2, or 3 (i.e., field nodes), there will be only two categories, bucket refusal-plus-clay (4 + 5) or category 6. Field node radii do not include areas in categories 1, 2, or 3; therefore the classification of each field node will be based on the relative area of only two categories within the circle, either category 4+5 or category 6. Whichever category represents the majority of river bottom in the circle will be the classification for the node.

While information will be tabulated for use in the area-based summation, not all areas are subject to the capping criteria. In particular, since capped areas in categories 1 through 5 above will not count against the capping limits, the Nodal Capping Index will likewise exclude capped nodes falling in the five categories of excluded areas. In addition, as noted above, compliant nodes that are capped only because they are surrounded by capped nodes will not count against the capping limits and thus will be excluded from the Nodal Capping Index.

The areas that are capped in categories 1 through 5 will be tracked separately since they are not subject to the Percentage Capping Limits. Nodes placed in categories 1 and 2 will be entirely excluded from the Nodal Capping Index, since the areas involved are small and capping in these areas is not subject to the percentage limits on capping. Capped nodes placed in categories 3, 4, and 5 will be excluded from the capped area summation of the Nodal Capping Index, but all nodes falling in these categories will be included in the dredged area summation of the Nodal Capping Index, since they are needed to track the entire area of the CU. Nodes in categories 4 and 5 are spatially identical to similar nodes in category 6 since they are part of the 80-foot-on-center post-dredging sample grid. Based on the experience of Phase 1, nodes in category 3 represent roughly ½ the area of nodes in categories 4, 5 and 6 and are included in the area summation as ½ the total count.

4.6.3 Nodal Capping Index

Compliance with the Percentage Capping Limits will be measured on a routine basis by use of the Nodal Capping Index, an area-weighted nodal index. The index will serve as a real-time surrogate for the area capped. For the purposes of the Residuals Standard, the extent of capping is essentially proportional to the number of non-compliant nodes in the CU, since these form the basis for the decision to cap. Thus, by using the Nodal Capping Index, it will be possible to quickly approximate the proportion of area capped and provide a near-real-time tool for measuring compliance with the standard. Use of an index avoids the actual complex geometry of cap layout as well as the complicated geometry introduced by the conservative approach in cap layout resulting from capping to the perimeter of compliant cores. Nodes placed in boundary areas, that is, structural set-back areas and cultural resource areas, will not be included because they generally represent very small areas compared to field nodes and their inclusion would serve to exaggerate their importance.

The extent of capping in a single CU for use calculating the Nodal Capping Index will be defined as follows:

$$A_{capped} = A_{CU} X \left[\frac{\Sigma(N_{field\ capped})}{\Sigma(N_{field}) + \frac{1}{2}\Sigma(N_{shoreline})} \right]$$

Where:

A_{capped} is the area capped in the CU as determined for the Nodal Capping Index

A_{CU} is the area of the CU in square feet

$\Sigma N_{field\ capped}$ is the sum of capped nodes in category 6 above in compliance categories A and B.

ΣN_{field} is the sum of all nodes in the CU that are not specifically identified as boundary nodes or shoreline nodes. This includes all nodes from categories 4, 5 and 6, irrespective of their compliance category in the CU. (*i.e.,* capped or uncapped).

$\Sigma N_{shoreline}$ is the sum of nodes in the shoreline area of a CU. This includes all shoreline nodes irrespective of their compliance category (*i.e.,* capped or uncapped).

This same formula will be used to determine the extent of capping of inventory by substituting the tally of capped inventory nodes (compliance category A only) in the numerator in place of the capped nodes. In the event that some boundary nodal locations represent areas similar in size to those represented by the field locations, their count may be added to the field nodal tally at EPA's discretion. The Nodal Capping Index for the fraction of total area capped at any point in Phase 2 for the purposes of compliance with the Residuals Standard will then be calculated as:

$$Nodal\ Capping\ Index = \frac{\sum A_{capped}}{\sum A_{CU}}\ X\ 100$$

Where:

ΣA_{CU} is the sum of the areas of the CUs completed to date in square feet

ΣA_{Capped} is the sum of capped areas of the CUs treated to date as given by the above formula in square feet

This formula effectively counts all regulated capped and all uncapped nodes on an area-weighted basis (equivalent to a Thiessen polygon basis) while also excluding capped nodes in categories 1 through 5, simplifying the tracking process.

4.6.4 Capping Evaluation and Control Levels

The capping Evaluation Levels and Control Levels presented in Tables 4-1 and 4-2 will be used in 2012 to evaluate, on an ongoing basis, the degree of success of the dredging design – in particular, the design DoC – in ensuring that the Percentage Capping Limits, as measured by the Nodal Capping Index, are not exceeded. This evaluation will be the basis for adjustments to be made, as needed, to the EoC, the design dredge elevation, and/or the dredging approach in the remaining dredge areas to ensure that the Percentage Capping Limits will not be exceeded.

Table 4-1
Total Capped Area Percentage for 2012

Acres Dredged In Phase 2	Evaluation Level %	Control Level %
80.0	12.9	14.3
90.0	12.9	14.1
100.0	12.8	14.0
110.0	12.7	13.9
120.0	12.6	13.8
130.0	12.5	13.6
140.0	12.4	13.5
150.0	12.3	13.4
160.0	12.2	13.3
170.0	12.1	13.2
180.0	12.1	13.0
190.0	12.0	12.9
200.0	11.9	12.8

Table 4-2
Inventory Capped Area Percentage for 2012

Acres Dredged in Phase 2	Evaluation Level %	Control Level %
80.0	3.5	3.9
90.0	3.5	3.9
100.0	3.5	3.8
110.0	3.5	3.8
120.0	3.4	3.8
130.0	3.4	3.7
140.0	3.4	3.7
150.0	3.4	3.7
160.0	3.3	3.6
170.0	3.3	3.6
180.0	3.3	3.6
190.0	3.3	3.5
200.0	3.2	3.5

During 2012, at each of the following times (hereinafter, the "Capping Review Dates"), GE will determine the percentage of the total Phase 2 area dredged that has been capped (other than capping in the non-counted capping areas) and also the percentage of the total Phase 2 area dredged that has been capped with inventory present (again, not counting capping in the non-counted capping areas), and will compare those percentages to the appropriate capping Evaluation Level and Control Level as set forth in Tables 4-1 and 4-2, respectively:

- As soon as post-design dredging sampling has occurred in 100 nodes in 2012;
- On July 31; and
- On December 1.

At each of those times, after making the aforesaid comparison, GE will proceed as follows:

- If neither the capping Evaluation Level nor the capping Control Level has been exceeded, GE need not make adjustments to the EoC and the design dredge elevation in remaining CUs, or more widely employ a 2-pass dredging approach, in order to reduce the cumulative amount of capping. However, GE will indicate, in its next Monthly Progress Report under the CD, the percentage of the total Phase 2 area dredged that has been capped (both in general and over inventory) in the non-counted capping areas as well as in other areas.
- If the applicable capping Control Level has been exceeded, then within 5 days of the applicable Capping Review Date, GE will submit to EPA, for review and approval, a report that sets forth the specific adjustments that GE proposes to make to the EoC and the design dredge elevation in the remaining dredge areas, and/or a specific plan for a wider usage of a 2-pass dredging approach, in order to reduce the cumulative amount of capping below the capping Evaluation Level. Such report will include GE's rationale for the proposed adjustments and, if it proposes to more widely use a 2-pass dredging approach, shall explain how that approach will be implemented. For the dredging that occurs between the time that GE submits this report to EPA and the time that EPA approves the report or directs GE to make adjustments other than those proposed in GE's report, GE will implement its proposed adjustments. Within 5 days after EPA approves the report or directs GE to make adjustments other than those proposed in GE's report, GE will implement the approved or required measures. If after making the adjustments approved or required by EPA, the cumulative amount of capping in Phase 2 (other than capping in the non-counted capping areas) falls below the applicable capping Evaluation Level, GE may, at its discretion, readjust the design dredge elevation in the remaining dredge areas, provided GE remains below the applicable capping Evaluation Level.
- If the applicable capping Evaluation Level has been exceeded but the applicable Control Level has not been exceeded, then within 5 days of the applicable Capping Review Date, GE will submit to EPA, for EPA's information, a report identifying

measures that GE will take to reduce the cumulative amount of capping below the capping Evaluation Level. GE will implement such measures by no later than 5 days after submitting said report to EPA.

4.7 REPORTING

GE will provide data sets containing pertinent data for implementation of the Residual Standard, including post-dredging elevations, analytical results from sampling, non-compliant boundaries, etc., to EPA in digital form as soon as practicable prior to the daily GE-EPA meetings. Bathymetric surveys will be provided to EPA in electronic form upon completion of the surveys and as soon as practicable prior to any presentation to EPA at the daily meetings. Any updates to the Nodal Capping Index will also be reviewed at the daily meetings.

GE will submit weekly progress reports and completed CU Certification of Completion forms to the EPA site manager, according to a schedule to be agreed upon by GE and EPA, for use in evaluating compliance with the Residuals Standard. The weekly reports will include:

- A summary of the results of residual sediment sampling;
- A summary of the evaluation of the residuals sampling data with respect to the Residuals Standard criteria for each CU evaluated (or portion thereof, where relevant), including exceedances of those criteria by CU (and portion, if relevant);
- A summary of the course of actions taken or proposed and the rationale for such actions;
- An update to the Nodal Capping Index; and
- Dredge bucket positioning system electronic data including dredge bucket electronic files.

Laboratory data will be made available to EPA upon receipt from the laboratory.

Following the signing by both GE and EPA of a final CU Construction Completion Certification form (i.e. Form 3) for a given CU (and any adjacent shoreline area), GE will prepare and submit to EPA a CU Completion Report in accordance with Section 5.2.4 of the revised SOW. Each CU Completion Report will include the following information:

- CU identification;
- Electronic version of all files and data used to prepare the certification package;
- Description of type(s) of dredging equipment used;
- Description of sediment type(s) encountered;
- Verification that the design EoC has been achieved in 95 percent or more of the dredged area in each CU or portion thereof;
- Residual sediment sampling results in the CU;
- Sediment imaging results (if available);

- The Nodal Capping Index and supporting data;
- Written verification that the sampling data were verified in accordance with the procedures described in Section 12 of the Phase 2 RAM QAPP, including a discussion of any data qualifiers applied;
- Discussion of any contingency actions taken;
- Discussion of backfill or cap placement;
- A map of the CU showing the concentration at each node and the area(s) to be backfilled or capped;
- A signed verification that the CU was backfilled or capped (as applicable) in accordance with the requirements of the Phase 2 PSCP Scope, this 2012 PSCP, the approved 2012 FDR, and any other applicable requirements under the CD; and
- A signed verification that the initial habitat replacement/reconstruction was completed (as applicable) in accordance with the requirements of the applicable approved FDR and any other applicable requirements under the CD.

4.8 SPECIAL STUDIES

During the 2012 season, GE will conduct inter-related sediment studies to (a) measure the baseline PCB concentrations in surface asediments within and downstream of Phase 2 dredge areas in River Sections 2 and 3, and (b) assess the spatial extent, concentration, and mass of PCBs deposited on surface sediments downstream of dredge areas. These studies are described in Section 9.3 of the Phase 2 RAM QAPP. The results of these studies will be documented in a DSR, which will be provided to EPA in accordance with a schedule set forth in Section 9 of the Phase 2 RAM QAPP. The analytical data generated will be forwarded to EPA via an automated electronic mail system as described in thePhase 2 RAM QAPP.

SECTION 5

PRODUCTIVITY PERFORMANCE STANDARD

This section discusses the Phase 2 Productivity Performance Standard set forth in the Hudson Phase 2 EPS (EPA 2010a) as it will apply to dredging operations and processing facility operations (sediment offloading, processing, and rail yard operations) in the 2012 season of Phase 2. It provides an overview of the Productivity Standard as set forth in the Hudson Phase 2 EPS, references the dredging production schedule, and summarizes the monitoring and reporting requirements for productivity.

5.1 OVERVIEW OF STANDARD

The Phase 2 Productivity Performance Standard establishes seasonal production targets for Phase 2 of the dredging project and provides guidelines for the project's progress to promote its completion in a timely fashion. The Hudson Phase 2 EPS states that the Productivity Standard is subordinate to the Resuspension and Residuals Performance Standards. This standard does not specify a definite timeframe for the completion of Phase 2.

Under the Hudson Phase 2 EPS, the target for productivity in Phase 2 is a volume of 350,000 cubic yards (cy) per year, which applies to the volume of sediments dredged, processed, and shipped off-site in that year. In order to meet this seasonal production target in Phase 2, it is essential that dredging operations proceed as efficiently as possible, consistent with the other Phase 2 EPS and the Phase 2 QoLPS. Achieving that goal will require streamlined field evaluations and decision-making, relying on close cooperation between EPA and the GE project team, to ensure that field decisions are made quickly and do not unnecessarily impede productivity.

The Phase 2 Productivity Standard also states that: (a) stabilization of shorelines and backfilling or capping, as appropriate, of areas dredged during a dredging season in Phase 2 must be completed by the end of the work season; and (b) all dredged materials must be processed and shipped for disposal by the end of each calendar year, rather than being stockpiled for disposal the following dredging season, subject to an extension in the event that delays attributable to disposal facility(ies) and/or rail carriers prevent such off-site shipments by the end of the calendar year.

The Phase 2 Productivity Standard states that a review of productivity will be conducted at the completion of each Phase 2 season, and that this review will be performed by EPA, GE, and the contractors before the end of the calendar year to identify potential revisions to both in-river and processing facility operations that will increase overall efficiency and productivity and ultimately reduce the overall project duration, if possible.

Finally, it should be noted that the planting of wetlands and aquatic vegetation will be conducted in the spring following each dredging season.

5.2 DESIGN ANALYSES TO ESTABLISH 2012 PRODUCTION SCHEDULE

As part of the final design and planning for the 2012 season of Phase 2, GE has developed a production schedule for that season, based on the target seasonal removal volume of 350,000 cy/year mentioned above. This production schedule is based on the expectation that dredging will occur 24 hours a day, 6 days a week (with the seventh day reserved for maintenance and make-up time for unplanned project interruptions). To achieve the target removal volume, the CUs targeted for dredging in 2012 are CUs 26 through 44.

The target dredging production schedule for 2012 is set forth in Table 4-1 of the 2012 RAWP. It will include target four-week removal volumes, extending from mid-May 2012 through October 2012. In addition, Figure 4-1 of the 2012 RAWP includes an overall production schedule showing the anticipated duration of 2012 dredging and sediment processing operations (through November 2012) and shipments for off-site disposal (through the end of calendar year 2012).

5.3 TEMPORARY STAGING AND OFF-SITE SHIPMENTS

Loading of processed sediments into rail cars for off-site transport and disposal will begin no more than 3 weeks following the start of dredging operations in 2012. The volume of processed sediments that will be staged at the processing facility at any given time (including at the Filter Cake Loading Area and the Coarse Material Staging Areas) will not exceed 130,000 cy (unless necessitated by delays attributable to disposal facility(ies) and/or rail carriers or as otherwise approved by EPA). Should the total volume approach 130,000 cy, GE will notify EPA and discuss the planned activities to address that situation. The height of the sediment piles temporarily staged at the Coarse Material Staging Areas will not exceed 30 feet. Processed material will not be staged at the unloading wharf(s). All materials dredged during the 2012 dredging season will be processed and shipped off-site for disposal by the end of 2012 unless doing so is prevented by delays attributable to disposal facility(ies) and/or rail carriers.

5.4 COMPARISONS OF PRODUCTION RATES TO PRODUCTION SCHEDULE

The actual dredging production rate during the 2012 dredging season will be compared to the production schedule provided in the 2012 RAWP to determine whether the estimated remaining volume of sediment to be dredged during the year may be increased or decreased, as warranted by the data. For purposes of establishing the actual dredging production rate, the following rules will apply:

> The dredging productivity will be based on the actual volume dredged, which will be measured as *in-situ* cy and will include the volume of sediment removed to achieve the removal limits specified in the design, including any volume associated with overcut,

side slope removal, dredge tolerance, and all associated dredging required to complete the remedial work, including access dredging for navigational purposes.

- For comparisons to the monthly production schedule, the actual total volume dredged during the applicable four-week period will be compared to the total volume scheduled for that four-week period in the production schedule in the 2012 RAWP.
- For comparisons to the annual production schedule, the actual total volume dredged and processed in 2012 will be compared to the total volume scheduled for that season in the production schedule in the 2012 RAWP.

5.5 ROUTINE MONITORING AND REPORTING

Implementation of the Productivity Performance Standard will require certain monitoring, recordkeeping and reporting activities as described below:

Dredging productivity will be monitored, and detailed records will be maintained to document production throughout the duration of the work. Specific monitoring and recordkeeping requirements are discussed in Section 7 of the DQAP; and reporting forms to be used to record daily productivity for the project (including information regarding the activities of each dredge and information on the estimated quantity of material dredged, processed, shipped off-site, and staged on-site) are included in Attachment 3 to the DQAP. Those forms will be available on-site

GE will prepare and submit to EPA weekly reports with the following information:

- Locations dredged;
- Number of hours of actual dredging time and gross volume dredged in each reporting period;
- Cumulative amount dredged for the season;
- Number of barges loaded and transported for off-loading and approximate volume in each;
- Time required for off-loading barges;
- Information on re-dredging efforts (locations, approximate volume, and time expended);
- Total tonnage of material shipped off-site;
- Concentration of PCBs in processed sediments (if known);
- Volume of water treated and returned to the river; and
- Delays encountered in the project, the reason for the delay, and the hours lost to production due to the delays.

In addition, GE will provide the same information listed above in the CD Monthly Progress Reports for each week during the month, the month, and the dredging season. Each such

monthly report during 2012 also will compare productivity on a weekly, four-weekly, and seasonal basis to the production schedule specified in the 2012 RAWP.

In addition to the information described above, GE will provide certain information to EPA relating to the characterization of dredged material as either subject to disposal under the Toxic Substances Control Act (TSCA) or non-TSCA material, as described in the Transportation and Disposal Plan for 2012 (2012 TDP) submitted to EPA in May 2012 as Appendix C to the 2012 RAWP. Specifically, as noted in the 2012 TDP, GE will provide EPA with post-processing sediment PCB results as they are received from the analytical laboratory and will review the results of that testing prior to beginning rail car loading. Further, GE will include in the weekly project productivity report the tonnage of TSCA and non-TSCA material shipped off-site.

In addition to the progress reports described above, GE will provide the electronic files tracking bucket movement, including records of buckets of sediment removed, counting both closed and partially closed buckets. These files will be delivered to EPA weekly one week after the actual work is completed. Further, daily scow tracking will be implemented and reported to the EPA so that the impacts of scow unavailability can be evaluated. Specifically, the status of each scow will be reported to EPA on a daily basis at the morning coordination meeting, including at a minimum: at CU being loaded; in transit to unloading; at mooring awaiting space at the unloading dock; at the unloading dock awaiting unloading; being unloaded; at mooring awaiting transit to loading; and in transit to loading.

An annual report will be submitted to EPA within 30 days of the end of work activities for the 2012 season – i.e., 30 days after completion of dredging, backfilling, capping, shoreline reconstruction/ stabilization, and sediment processing/water treatment for that season. This annual report will provide the following:

- Estimated total *in-situ* volume of sediments dredged;
- Total weight of sediments shipped off-site and, if applicable, the estimated weight of remaining sediments in temporary on-site stockpiles;
- A graph or graphs showing planned cumulative dredging production and actual cumulative production achieved to date;
- Tables, graphs, and/or other means of showing: (a) the cumulative net mass of Tri+ PCBs and TPCBs released to the Lower Hudson River from the beginning of the project to the latest date for which data are available; (b) the cumulative net mass of Tri+ PCBs and TPCBs released to the Lower Hudson during the 2012 dredging season; (c) a calculation of the net mass transported past Waterford, expressed as a running fraction of the actual mass removed for the 2012 season and for the project to date; and (d) an estimate of Tri+ PCB mass removed from the river compared to the remaining mass to be removed – using the methodology described in Section 4.3 of the Hudson Phase 2 EPS to calculate net loads attributable to dredging, and the methodology

described in Section 7 of the Hudson Phase 2 EPS to calculate the Tri+ PCB mass to be removed;

- Identification of any problems in meeting the planned annual production rate and steps taken to overcome those problems;
- Copies of certificates of disposal received from the disposal facilities;
- Copies of all weekly progress reports (daily production report forms will be available at the site for review by EPA);
- Other pertinent data summaries;
- Record (as-built) drawings for areas dredged and backfilled or capped (as necessary) in 2012; and
- A certification by a New York registered professional engineer that the procedures specified in the DQAP were followed during 2012.

On-site records will also be kept for the following:

- Locations of backfill and sediment caps placed;
- Volumes of backfill or capping material placed and the hours spent in placing backfill and sediment caps; and
- Locations and details of shoreline work, including shoreline dredging and restoration rates.

SECTION 6

AIR QUALITY PERFORMANCE STANDARD

This section discusses the Phase 2 QoLPS for air quality, which is applicable to both dredging operations and processing facility operations. It includes an overview of the standard, as set out in the Hudson Phase 2 QoLPS; a summary of the design analyses conducted to assess achievement of the standard during the 2012 season of Phase 2 and the measures included in the Phase 2 design for that season in an effort to achieve the standard; a reference to the routine and contingency air quality monitoring to be conducted during 2012; a description of the response actions to be taken in the event of an exceedance of an applicable standard (or other trigger level) or in response to an air quality complaint; and a description of the relevant reporting procedures.

6.1 OVERVIEW OF STANDARD

The Air Quality Performance Standard includes numerical standards for PCBs in ambient air and for opacity (the reduction of visibility from air emissions), and requires an analysis of achievement of the National Ambient Air Quality Standards (NAAQS) for several other air pollutants. Further information on each of these aspects of the standard is presented below.

6.1.1 PCBs

The QoLPS for air quality includes standards and "concern levels" (at 80 percent of the standard levels) for TPCB concentrations in the ambient air. There are separate concern levels and standards for residential and commercial/industrial areas. They are:

- For residential areas, a concern level of 0.08 micrograms per cubic meter ($\mu g/m^3$) and a standard of 0.11 $\mu g/m^3$, both as 24-hour average PCB concentrations; and
- For commercial/industrial areas, a concern level of 0.21 $\mu g/m^3$ and a standard of 0.26 $\mu g/m^3$, both as 24-hour average PCB concentrations.

The points of compliance for attaining these standards and concern levels are the locations of residential or commercial/industrial receptors. During Phase 2 of the RA, these standards and concern levels will remain in effect, but monitoring for in-river operations will be more focused on nearby receptors and mitigation measures will be required only if exceedances of a standard persist for three consecutive days, as discussed further below.

6.1.2 Opacity

Opacity is a quantification of the reduction in visibility resulting from air emissions. The air quality standard for opacity, based on New York State air regulations (6 NYCRR § 211.3), is that opacity during project operations must be less than 20 percent as a 6-minute average, except that there can be one continuous 6-minute period per hour of not more than 57 percent opacity. This standard will remain in effect in Phase 2, although monitoring will be performed only in response to observations or complaints, as discussed below.

This standard covers vessels, vehicles and equipment, unless otherwise exempt under 6 NYCRR § 211.3. This standard will not apply to the line-haul locomotive engines used by the rail carriers, which are subject to EPA's national standards governing opacity (40 Code of Federal Regulations [CFR] Part 92). However, it will apply to the locomotives used to operate the rail yard.

6.1.3 NAAQS

Under the Federal Clean Air Act, EPA has promulgated NAAQS for several pollutants (known as "criteria pollutants") to protect public health and welfare. These include: respirable particulate matter (i.e., < 10 micrometers in diameter) (PM_{10}), fine particulate matter (i.e., < 2.5 micrometers in diameter) ($PM_{2.5}$), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_x), and ozone (O_3).

An air quality modeling analysis conducted during the design of Phase 1 of the RA demonstrated that the emissions of criteria pollutants from in-river activities and processing facility operations during Phase 1 were not predicted to cause exceedances of the NAAQS. The Phase 2 PSCP Scope and Phase 2 CHASP Scope require GE, as part of the Phase 2 final design, to evaluate the need to revise the prior analysis to reflect any anticipated operational or equipment changes in Phase 2 that could affect these pollutants. If no such change is anticipated, or if any revised air quality analysis validates prior assumptions, no monitoring or further evaluations of the criteria pollutants will be necessary during Phase 2.

6.2 DESIGN ANALYSES AND ROUTINE CONTROL MEASURES

This section describes the Phase 2 design analyses conducted for airborne PCBs, opacity, and criteria pollutants and the routine control measures to be implemented during the 2012 construction season to address air quality.

6.2.1 PCBs in Ambient Air

Design Analyses

The 2012 FDR identifies areas targeted for dredging in 2012 that have the potential to emit PCBs to the air at levels close to or exceeding the PCB air quality standards, using the following criteria:

- Areas with an average total PCB concentration in the sediments of greater than 150 mg/kg over a one-acre area;
- Areas with low water velocities (i.e., near the shore or in backwater areas); and
- Areas within 1,000 feet of a receptor.

The areas identified are shown on drawings in the 2012 FDR.

Routine Control Measures

The 2012 FDR also identifies the BMPs that will be implemented in these identified areas. These include the following:

- Fully covering sediments contained in a barge with water;
- Alternatively, for sediments from areas with average total PCB concentrations greater than 150 mg/kg over a one-acre area, fully covering those sediments in a barge with sediments from areas with lower PCB concentrations (i.e., less than 150 mg/kg);
- Retaining 5 feet of freeboard on the barge (i.e., distance between the sediment/water level in the barge and the top of barge coaming), or else using a wind screen; and
- If sediments from such an area are transported to an on-river dewatering barge, covering the majority of the dewatered sediments contained in the barge with a layer of water prior to transport to the processing facility for unloading.

As also provided in the 2012 FDR, an additional BMP to reduce PCB air emissions will be the prioritization for transport to the processing facility and for unloading at that facility of barges containing sediments with high PCB concentrations (i.e., sediments from areas with average total PCB concentrations greater than 150 mg/kg over a one-acre area). Barges containing sediments from these areas will not be staged without a water cover for extended periods of time prior to unloading.

As discussed further in the 2012 FDR, given the limitations on staging of processed sediments at the processing facility (described in Section 5.3 above), the expanded coarse material staging areas at the processing facility are not expected to result in an increase in PCB air emissions relative to those in 2011. Accordingly, no additional routine BMPs are necessary at the processing facility.

6.2.2 Opacity

The Phase 2 design for 2012 is expected to meet the numerical QoLPS for opacity. As required by the design, contractors will maintain and operate vessels and vehicles properly to prevent opacity problems, and will use pollution control systems for process equipment that are designed to prevent opacity concerns. Also, routine maintenance of diesel engines, generators and other equipment will be required throughout the project. Opacity monitoring will be performed only (a) in the event of observations by GE or EPA project staff or others indicating a potential opacity issue, (b) in response to complaints, or (c) as otherwise directed by the Construction Manager. If this monitoring shows an exceedance of the opacity standard, appropriate repairs or other measures will be taken to prevent further exceedances.

6.2.3 NAAQS

In accordance with the Phase 2 PSCP Scope and Phase 2 CHASP Scope, GE has evaluated the need to revise the Phase 1 design analysis (which demonstrated compliance with the NAAQS) to reflect any anticipated operational or equipment changes in the 2012 season of

Phase 2 that could affect these pollutants. That evaluation (which is similar to the evaluation presented in the 2011 FDR) is presented in Attachment F to the 2012 FDR. It confirms that the Phase 1 analysis should likewise apply to the 2012 dredging and facility operations, and that thus there is no need for a more detailed revised NAAQS analysis for 2012. As a result, no provisions for monitoring, control, or contingency actions for criteria pollutants will be necessary during implementation of Phase 2 in 2012.

6.3 ROUTINE MONITORING

The monitoring program to assess achievement of the air quality criteria for PCBs, including monitoring locations, frequency, and sample collection and analytical techniques, is described in detail in Section 5 of the Phase 2 RAM QAPP. In summary, PCB air monitoring, employing samplers operating continuously for 24 hours, will be conducted at locations along the dredging corridor (selected to be representative of receptors), at Lock 7, at unloading areas, and around the processing facility. In addition, monitoring will be conducted at a permanent background station situated upwind of the 2012 dredge areas, the unloading areas, and the processing facility.

The results of the routine PCB air monitoring will be compared with the applicable PCB numerical criteria in the Air Quality Performance Standard. However, achievement of the applicable concern level or standard will be assessed at receptors (residential or commercial/ industrial, as applicable), either via monitoring at the receptor locations or, where a monitor cannot be placed to accurately represent a given receptor, by conservative modeling (with EPA approval) using the monitoring data from locations closer to the source to predict ambient air PCB levels at the receptor location. GE will attempt to use monitoring data, where practical, in preference to modeling, in assessing achievement of the air quality standards.

Opacity monitoring will also be described in Section 5 of the Phase 2 RAM QAPP. Opacity will not be monitored routinely but only in response to observations by project personnel or others or in response to complaints or as directed by the Construction Manager for particular pieces of equipment that could have opacity issues.

6.4 CONTINGENCY MONITORING

In the event of an exceedance of a PCB concern level, GE will notify EPA and evaluate the circumstances of the exceedance and potential for future exceedances, as described in Section 6.5, but contingency monitoring will not be required. In the event of an exceedance of a PCB standard, GE will notify EPA as described in Section 6.5, and may implement contingency monitoring for PCBs as necessary, as described in Section 5 of the Phase 2 RAM QAPP. That contingency monitoring will include, in certain circumstances described in the Phase 2 RAM QAPP, a reduction of the laboratory turn-around time for air samples from 72 hours to 48 hours; and it may also include performance of increased monitoring if appropriate to assess the cause of the exceedance. The contingency monitoring, if implemented, will be continued until the standard is achieved.

Monitoring of equipment for opacity will be conducted if visual observations by GE or EPA project staff or others indicate a potential opacity issue or in response to complaints or if directed by the Construction Manager for particular pieces of equipment. Such monitoring will be conducted by a certified visual observer, as described in Section 5 of the Phase 2 RAM QAPP.

6.5 CONTINGENCY/RESPONSE ACTIONS

This section describes the actions that GE will undertake in the event of an exceedance of the numerical criteria in the Air Quality Performance Standard or in response to an air quality complaint.

6.5.1 Actions in Event of Exceedance of PCB Air Quality Concern Level

If monitoring (or modeling, if used to assess compliance at a receptor, with EPA approval) demonstrates that an applicable air quality concern level has been exceeded, GE will promptly notify EPA, but no later than 24 hours after receipt of the analytical results or otherwise becoming aware of the exceedance (whichever comes first). GE will then evaluate the circumstances of the exceedance and the potential for additional exceedances in the future. In such a situation, GE will adaptively manage the dredging operation in an effort to reduce PCB air emissions below the applicable concern level. The adaptive management steps to be taken in such a case will be at GE's discretion and may include one or more of the BMPs listed in Section 6.2.1, to the extent not already implemented in the area in question.

6.5.2 Actions in Event of Exceedance of PCB Air Quality Standard

If monitoring (or modeling, if used to assess compliance at a receptor, with EPA approval) demonstrates an exceedance of an applicable air quality standard, GE will promptly notify EPA, but no later than 24 hours after receipt of the analytical results or otherwise becoming aware of the exceedance (whichever comes first). GE will also investigate the cause of the increased emissions and will implement contingency monitoring as described in Section 6.4. If appropriate, the investigation of the cause will include the analysis of air samples that had previously been collected and stored but not analyzed.

In addition, upon receipt of monitoring data (or modeling if used with EPA approval) showing an exceedance of an applicable air quality standard, GE will begin work with EPA to develop an action plan for the implementation of mitigation measures in the event that the exceedances persist for three consecutive days. The mitigation measures to be considered in this situation will include the BMPs listed in Section 6.2.1, to the extent not already implemented in the area in question, and may also include one or more of the following measures, depending on the specific location, circumstances, and cause of the exceedance:

- Prohibiting use of "bucket flaps" on dredge buckets in air emission BMP areas;
- If sediments from an area other than an air emission BMP area are transported to an on-river dewatering barge, covering the majority of the dredged sediments contained in the

barge with a layer of water prior to transport to the processing facility for unloading or to another dredge for loading to be completed;[5]

- Evaluating the number of barges from air emission BMP areas that can be staged at the processing facility unloading wharf at any given time;
- If the exceedance of the standard occurred when sediments from an air emission BMP area are being directly off-loaded from a barge, considering transport of such sediments to a filter cake staging enclosure, rather than the coarse material staging area, for staging;
- Erecting wind screens around sediment processing operations;
- Covering material stockpiles that will be staged for an extended period of time before off-site shipment or controlling the shape and placement of the piles;
- Minimizing staging time for sediments containing PCBs;
- Using larger excavation equipment to adjust the surface area/volume ratio during material handling;
- Covering tanks or PCB-containing truck beds that prove to be a significant source of PCB emissions;
- Moving transloading operations further away from receptors;
- Modifying operations to limit emissions; and/or
- Spraying a chemical spray-on cover product (e.g., ConCover) or biodegradable foam (if determined to be compatible with the treatment system) over material stockpiles that will be staged for an extended time before off-site shipment.

If the exceedances of the standard have continued for three consecutive days, GE will recommend mitigation measures to EPA. EPA will either approve those mitigation measures or direct GE to implement other measures. GE will implement the measures approved or directed by EPA. If subsequent sample results show that mitigation is not effective, EPA will review the monitoring data, current and planned operations, and weather conditions; and it may, for an exceedance in the dredging corridor, require a temporary slowdown or relocation of dredging activities in the area to reduce ambient air PCB levels. For an exceedance around the processing facility, EPA will discuss further mitigation with GE.

6.5.3 Actions in Event of Exceedance of Opacity Standard

If the opacity standard is exceeded, GE will notify EPA, NYSDEC and NYSDOH, and will take appropriate contingency measures (e.g., repair or, if necessary, upgrading or replacing equipment). A report will be included in the next Monthly Progress Report identifying reasons for the exceedance and any mitigation measures taken to prevent future exceedances.

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[5] This BMP is already listed as a routine measures for sediments from air emission BMP areas in Section 6.2.1 above.

6.5.4 Actions in Event of Air Quality Complaint

If a complaint relating to air quality is recorded, GE will take the following steps:

1. Investigate the cause of the complaint to verify that it is project-related.
2. If the complaint is project-related, conduct monitoring and/or modeling, as necessary, to determine whether the applicable concern level or standard has been exceeded in the area referred to in the complaint.
3. If the monitoring and/or modeling shows an exceedance of the applicable concern level or standard, implement the steps specified in Section 6.5.1, 6.5.2, or 6.5.3, as applicable.
4. If the monitoring and/or modeling do not show an exceedance of the applicable concern level or standard, report the preliminary monitoring results to EPA, work with EPA to evaluate potential mitigation measures to address the complaint, and if both GE and EPA agree, implement such measures.
5. Notify the person registering the complaint of the steps taken to resolve the complaint and include a report on the complaint and response actions (if any) in the monthly reporting of complaints to EPA.

6.6 REPORTING

GE will submit regular weekly progress reports to EPA that include information related to PCB concentrations in air near the processing facility and dredging operations, ambient PCB levels (including background levels and baseline levels prior to start-up), and monitoring plan adjustments (if any). The weekly reports will be in a tabular format and will include the following information for the air samples collected for PCB analysis:

- Location (including northing and easting coordinates);
- Field sample and lab sample IDs;
- Sample collection date;
- Sample volume (m^3);
- PCB results ($\mu g/m^3$ or ng/m^3); and
- Whether the result exceeds an applicable concern level or standard.

As previously noted, in the event of an exceedance of a PCB air quality concern level or standard, GE will notify EPA promptly, but no later than 24 hours following the receipt of the analytical data or otherwise becoming aware of the exceedance (whichever comes first).

GE will provide weekly status reports to EPA on exceedances of the PCB air quality concern levels and standards. These reports will include, for each exceedance, a description of the activities being conducted in the vicinity of the air monitor, any mitigation measures that were already in place in the area to address air releases of PCBs, and actions taken (if any) in response to the exceedance. These reports may combine reportable situations that occur in the

same location on consecutive days and in similar circumstances, and will be provided in a tabular format in the regular weekly progress reports.

Exceedances of the opacity standard will be reported within 24 hours of observation. The reasons for the exceedance and any mitigation measures taken will be provided in the next Monthly Progress Report submitted pursuant to the CD. Each Monthly Progress Report will also summarize any opacity monitoring activities performed during the previous month.

A report on air quality complaints, regardless of whether they involved exceedances of a standard or concern level, and on response actions taken (if any) or other resolution of the complaints will be included in the monthly reporting of complaints to EPA.

SECTION 7

ODOR PERFORMANCE STANDARD

This section discusses the Phase 2 QoLPS for odor, which is applicable to both dredging operations and processing facility operations. It includes an overview of the standard, as set out in the Hudson Phase 2 QoLPS; a summary of the pertinent design analyses; a summary of the routine and contingency monitoring for odor; a description of the response actions to be taken in the event of an exceedance of the numerical odor standard or in response to an air quality complaint; and a description of the relevant reporting procedures.

7.1 OVERVIEW OF STANDARD

Odors may be generated by dredged sediments that contain decaying organic matter. Odors are difficult to measure because they vary depending on the concentration of the pollutant and the sensitivity of the person exposed to the odor.

The primary odor of concern during dredging and sediment processing activities would come from hydrogen sulfide (H_2S) released by decaying plants and other organic material found in the river sediments. PCBs are odorless.

The QoLPS for odor establishes a standard for H_2S to minimize unwanted odors from the project. The standard for H_2S is 14 $\mu g/m^3$ or 0.01 ppm as a 1-hour average.

In addition, the QoLPS for odor specifies a "concern level" consisting of the presence of uncomfortable project-related odors identified by project workers or an odor complaint from the public, and an "exceedance level" consisting of an exceedance of the numerical H_2S standard or "frequent, recurrent odor complaints related to project activities." (Thus, the "exceedance level," as defined in the Hudson Phase 2 QoLPS, can occur even in the absence of a measured H_2S level exceeding the numerical H_2S standard – i.e., if there are "frequent, recurrent odor complaints related to project activities.")

7.2 DESIGN ANALYSES AND ROUTINE CONTROL MEASURES

It is not anticipated that sediments dredged in 2012 will generate odors that will reach the concern or exceedance levels in the QoLPS. Nevertheless, to minimize odors and prevent complaints, the following routine control measures will be employed in 2012:

- Debris from dredging operations, which is more likely than other types of dredged material to contain wood, vegetation, biota and other types of organic material, will be separated from the other dredged material at the waterfront area of the processing facility. If an offensive odor is detected from this debris, it will be moved as quickly as practical to the debris staging area in the center of the processing facility site.

- Filter cake solids will be covered using roll-off box covers if uncomfortable odors are encountered during filter cake drops prior to transportation to the filter cake storage enclosure.
- Air handling systems at the two filter cake staging enclosures will be operated and maintained while material is stored.

7.3 ROUTINE MONITORING

Odor sampling will be performed in response to: (1) on-site worker notifications of odors; or (2) odor complaints received from the public in the immediate vicinity of the remediation zone. If the odor is identified as potentially H_2S, monitoring for H_2S will be performed upwind and downwind of the suspected source. A description of this monitoring, including monitoring locations and sampling techniques, is provided in Section 6 of the Phase 2 RAM QAPP.

7.4 CONTINGENCY MONITORING

Contingency monitoring for H_2S is also described in Section 6 of the Phase 2 RAM QAPP. As stated there, if odor monitoring shows that the 1-hour standard of 0.01 ppm (14 $\mu g/m^3$) for H_2S is exceeded and/or if odor complaints are persistent, corrective actions may be warranted. Such actions may include, where warranted, additional (contingency) monitoring to further assess the source of the odor and/or to establish the effectiveness of the corrective actions taken.

7.5 CONTINGENCY/RESPONSE ACTIONS

This section describes the actions that GE will undertake in the event of exceedance of the numerical standard for H_2S or in response to an odor complaint.

7.5.1 Actions in Event of Exceedance of Hydrogen Sulfide Standard

If monitoring for H_2S is conducted (as described above) and demonstrates an exceedance of the H_2S numerical standard, GE will take the following steps:

1. Promptly notify EPA, but no later than 24 hours after receipt of the analytical data or otherwise becoming aware of the exceedance (whichever comes first).
2. Investigate the source of the odor, to the extent possible, to determine if it is project-related. This investigation may include, as relevant, an inspection of the entire sediment processing areas to ensure that good housekeeping and operational practices are being followed. In such an inspection, checks will be made to see if material piles have been left uncovered, air handling systems are operating properly, equipment/ systems malfunctions have occurred or any unsatisfactory work practices are observed that could promote the emanation of odors.
3. If the source of odor is project-related, develop an action plan, in coordination with EPA staff, to implement mitigation measures (as discussed in Section 7.5.3), and upon EPA approval, implement those measures.
4. If appropriate, continue regular H_2S monitoring until the issue is resolved.

5. Include a report on the exceedance, including any mitigation measures taken, in the next weekly progress report, as described in Section 7.6.

7.5.2 Actions in Event of Odor Complaint

If a complaint relating to odor is received and the odor is identified as potentially H_2S, GE will conduct the H_2S monitoring described in Section 6 of the Phase 2 RAM QAPP. If the monitoring shows an exceedance of the H_2S standard, GE will implement the steps defined in Section 7.5.1. If the monitoring does not show an exceedance of the H_2S standard, GE will report the preliminary monitoring results to EPA, work with EPA to evaluate potential mitigation measures to address the complaint, and if both GE and EPA agree, implement such measures. In addition, in either case, GE will notify the person who registered the complaint of the steps taken to resolve the complaint, and will include a report on the complaint and response actions (if any) in the monthly reporting of complaints to EPA.

If an odor complaint is received and the odor is not identified as H_2S, GE will take the following steps (multiple complaints regarding the same potential odor will be treated as one complaint):

1. Document the odor complaint and investigate the source of the odor to determine if it is project-related (as described above).
2. Notify EPA within 24 hours of receiving the complaint.
3. If the odor is project-related, investigate the odor to determine if it is "uncomfortable," rather than simply discernible. (For this purpose, an "uncomfortable" odor is defined, in accordance with 6 NYCRR § 211.2, as an odor which "unreasonably interfere[s] with the comfortable enjoyment of life or property.") This investigation will include further discussion of the nature and intensity of the odor with the person registering the complaint, and if necessary, obtaining an objective assessment of odor intensity.
4. If a project-related uncomfortable odor is identified, take mitigation measures as appropriate to reduce or eliminate the source of the odor (as discussed in Section 7.5.3).
5. Notify the person registering the complaint of measures taken to reduce or eliminate the source of the odor, and include a report on the complaint and response actions (if any) in the monthly reporting of complaints to EPA.

As noted above, the QoLPS for odor defines the "exceedance level" to include "frequent, recurrent odor complaints." For this purpose, "frequent, recurrent complaints" will be defined on a case-by-case basis. However, the occurrence of such complaints will trigger the same responses described above.

7.5.3 Potential Mitigation Measures

In the event that the steps described above indicate the need for mitigation measures, GE will implement such measures, as appropriate. Selection of specific actions will be determined

on a case-by-case basis. GE may consider the following, or other, as-yet-unidentified measures, depending on the specific cause of the odor:

- Adjusting handling procedures for, or moisture content of, dredged sediments;
- Adding water to barges to increase the depth of water covering dredged sediment during transport;
- After prompt transfer of debris with an offensive odor to the debris stockpile area near the rail yard (as discussed in Section 7.2), covering the debris or loading it directly into a rail car for transport off-site;
- Using tarps or covers at the processing facility to prevent odors from escaping from dredged sediments;
- Applying a foam agent (if determined to be compatible with the treatment system) to cover materials or a chemical agent that will neutralize the odor; and/or
- Relocating piles of dredged material to the filter cake staging enclosures or other areas.

7.6 REPORTING

As indicated above, GE will notify EPA of odor complaints from the public within 24 hours of receipt of the complaint, and will notify EPA of an exceedance of the numerical H_2S standard within 24 hours of receipt of the analytical data showing the exceedance or otherwise becoming aware of the exceedance (whichever comes first). For exceedances of the H_2S standard, a summary outlining the reasons for the exceedance and any mitigation measures taken will be provided in a tabular format in the regular weekly progress reports. Such summaries may combine reportable situations that occur in the same location on consecutive days and in similar circumstances.

In addition, during dredging operations, monthly reports will be submitted to EPA (as part of the Monthly Progress Reports pursuant to the CD) summarizing the odor monitoring activities (if any) for the previous month. The summary will be in tabular format and will include the reason for the monitoring, the date(s) and location(s), and the monitoring results. In addition, a log of any odor complaints, monitoring, and follow-up actions taken to resolve the complaint will be included (in tabular format) in the monthly reporting of complaints to EPA.

SECTION 8

NOISE PERFORMANCE STANDARD

This section discusses the Phase 2 QoLPS for noise, which is applicable to both dredging operations and processing facility operations. It includes an overview of the Noise Performance Standard, as set out in the Hudson Phase 2 QoLPS; a summary of the design analyses conducted to assess achievement of the standard during the 2012 season of Phase 2 and the measures included in the Phase 2 design for that season to control noise levels; a reference to the routine and contingency noise monitoring to be conducted in 2012; a description of the response actions to be taken in the event of an exceedance of an applicable noise criterion or in response to a noise complaint; and a description of the relevant recordkeeping and reporting procedures.

8.1 OVERVIEW OF STANDARD

EPA established the Noise Performance Standard to limit the effects of project noise on the community. EPA categorized project activities that have the potential to generate noise as either short-term or long-term. In terms of the anticipated activities for the 2012 season, short-term activities include dredging, operation of the Work Support Marina, and backfilling/capping, and long-term activities include sediment processing and rail yard operations at the processing facility (which will last throughout the year).

In developing its QoLPS for noise, EPA considered the effects of daytime and night-time dredging and sediment processing activities near residential areas. For example, a lower residential noise standard has been developed for night-time hours, from 10 p.m. to 7 a.m. This lower standard also applies to mixed commercial and residential areas. The numerical noise criteria set forth in the QoLPS are expressed in decibels using the A-weighted scale (dBA). They are as follows:

- Short-Term Criteria (applicable to dredging, Work Support Marina operations and backfilling/capping activities):
  - *Residential Control Level* (maximum hourly average)

    Daytime = 75 dBA
  - *Residential Standard* (maximum hourly average)

    Daytime = 80 dBA

    Night-time (10:00 pm – 7:00 am) = 65 dBA
  - *Commercial/Industrial Standard* (maximum hourly average)

    Daytime and night-time = 80 dBA
- Long-Term Criteria (applicable to processing facility operations):
  - *Residential Standard* (24-hour average)

Daytime and night-time = 65 dBA

– *Commercial/Industrial Standard* (maximum hourly average)

Daytime and night-time = 72 dBA

The points of compliance for attaining these numerical criteria are the locations of residential or commercial/industrial receptors.

The QoLPS for noise defines the "concern level" as an exceedance of the residential control level, an exceedance of an applicable noise standard that can be easily and immediately mitigated, or receipt of a project-related noise complaint. It defines the "exceedance level" as an exceedance of an applicable noise standard that cannot be easily and immediately mitigated or as "frequent, recurrent noise complaints related to project activities." Thus, the term "exceedance" is used in two ways in this QoLPS – both to designate noise levels above an applicable numerical criterion and as one of the two action levels in the standard. It is important to keep this distinction in mind, because the "concern level" can include exceedances of the numerical noise criteria as well as complaints, and the "exceedance level" can include situations that do not involve exceedances of the numerical noise criteria (i.e., frequent, recurrent complaints). To avoid ambiguity, this 2012 PSCP uses the term "exceedance" for noise levels above a criterion and the term "exceedance action level" for the higher action level.

8.2 DESIGN ANALYSES

The Phase 2 CHASP Scope and Phase 2 RAM Scope require that the Phase 2 design include an updated evaluation of noise intensity generated by equipment, processes, and traffic associated with site operations based on Phase 1 noise measurements. They provide that, if Phase 2 will include equipment changes or changes to the processing facility that could result in increased noise levels over those experienced in Phase 1, this evaluation would include noise attenuation modeling, and GE would conduct a study at the beginning of dredging or processing facility operations (as applicable) to validate the modeling analysis. For 2012, GE has determined, as discussed in Section 2.3.6 of the 2012 FDR, that the new equipment that will be installed and used at the processing facility is not expected to significantly increase noise levels at the processing facility compared to those in Phase 1 or 2011. However, GE will conduct a noise survey at locations around the processing facility during a period of peak facility production rates in 2012 to confirm that expectation. That survey is described in Section 7 of the Phase 2 RAM QAPP. In addition, as discussed in Section 8.4, noise monitoring will be conducted by the pertinent contractor at the initial start-up of any operation or use of equipment that is different from that used previously in the project and could result in increased noise levels.

8.3 ROUTINE CONTROL MEASURES

The routine noise control measures to be implemented during 2012 project operations are specified in the 2012 FDR (Specification Section 02931).

8.4 ROUTINE MONITORING

As discussed above, a noise monitoring survey will be conducted at the beginning of processing facility operations in 2012 to to confirm that there will be no increase in noise levels from that facility over those in Phase 1 and the first year of Phase 2. In addition, during 2012 dredging and facility operations, noise monitoring will be conducted by the pertinent contractor at the initial start-up of any operation or use of equipment that is different from that used previously and could result in increased noise levels. This contractor monitoring will not be considered monitoring for compliance with the Noise Standard; rather, if this monitoring shows a sound level above the criteria in the Noise Standard, additional monitoring will be conducted at a location closer to the nearest receptor(s) to assess attainment of those criteria. A noise level above the criteria in the Noise Standard will be considered an exceedance of those criteria only if confirmed by that follow-up monitoring. In addition, noise monitoring will be conducted in response to noise complaints, as also discussed in Section 8.5. This monitoring will be performed in accordance with methods and procedures specified in Section 7 of the Phase 2 RAM QAPP.

8.5 CONTINGENCY MONITORING

If a noise complaint is received from the public and is verified as project-related, noise monitoring will be conducted at the site of the complaint as necessary to determine whether the daytime residential noise control level or a noise standard has been exceeded.

In the event that noise monitoring, whether conducted as a follow-up to the contractor monitoring at the start-up of an operation or use of equipment or conducted in response to a complaint, shows an exceedance of the daytime residential noise control level or a noise standard, additional noise monitoring will be conducted as follows:

- If the exceedance was reported at a monitor that is not representative of a receptor, additional monitoring will be conducted at a location closer to the nearest receptor (e.g., the nearest occupied building) to the extent practicable.
- Additional monitoring will be conducted as needed to evaluate the cause of the noise increase.
- Additional background noise monitoring will be conducted if needed to assess the potential impact of a non-project-related noise source on receptors.
- Noise monitoring will continue until it confirms that noise levels are below the control level or standard.

These additional types of monitoring are referred to as contingency monitoring and are discussed further in Section 7 of the Phase 2 RAM QAPP.

8.6 CONTINGENCY/RESPONSE ACTIONS

This section describes the actions that GE will undertake during the 2012 season in the event of an exceedance of the numerical noise criteria or in response to a noise complaint.

8.6.1 Actions in Event of Exceedance of Residential Control Level

If the daytime noise control level for residential areas is exceeded at a monitor established for such an area, either during the follow-up monitoring to contractor monitoring or during the monitoring in response to a complaint, GE will take the following steps:

1. Investigate the cause of the increased noise to verify that it is project-related.
2. If noise increase is project-related, implement additional monitoring, as appropriate, as discussed in Section 8.5.
3. Consider mitigation measures to prevent or minimize future exceedances and, if appropriate, implement such measures. In this situation, the measures to be taken will be at GE's discretion and may include one or more of the measures listed in Section 8.6.4 below.
4. Provide a follow-up report to EPA describing the exceedance and any actions taken to address the exceedance in the next weekly progress report, as described in Section 8.7.

8.6.2 Actions in Event of Exceedance of Noise Standard

If an applicable noise standard is exceeded either during the follow-up monitoring to contractor monitoring or during the monitoring in response to a complaint, GE will take the following steps:

1. Promptly notify EPA, but no later than 24 hours after discovery of the exceedance.
2. Investigate the cause of the exceedance to verify that it is project-related.
3. If the noise increase is project-related, implement additional monitoring as discussed in Section 8.5.
4. Develop an appropriate approach, in coordination with EPA, for implementation of mitigation measures (as discussed in Section 8.6.4 below), propose such measures to EPA, and, upon EPA approval, implement those measures or such other measures as may be directed by EPA.
5. Continue additional monitoring until the standard is achieved.
6. Provide a follow-up report to EPA, including an analysis of the cause of the exceedance and a description of mitigation measures taken, in the next weekly progress report, as described in Section 8.7.

Although, as noted in Section 8.1 above, the QoLPS for noise distinguishes between exceedances of a standard that are easily and immediately mitigated (concern action level) and those that are not (exceedance action level), the same actions described above will be taken in

either case. However, the difficulties and time necessary to mitigate exceedances will obviously affect the response actions to be taken.

8.6.3 Actions in Event of Noise Complaint

If a complaint relating to noise is recorded, GE will take the following steps:

1. Investigate the cause of the complaint to verify that it is project-related.
2. If the complaint is project-related, conduct monitoring to determine whether the applicable control level or standard has been exceeded in the area referred to in the complaint.
3. If the monitoring shows an exceedance of the applicable control level or standard, implement the steps specified in Sections 8.6.1 or 8.6.2, as applicable.
4. If the monitoring does not show an exceedance of the applicable control level or standard, report the preliminary monitoring results to EPA, work with EPA to evaluate potential mitigation measures to address the complaint, and if both GE and EPA agree, implement such measures.
5. Notify the person registering the complaint of the steps taken to resolve the complaint, and include a report on the complaint and response actions (if any) in the monthly reporting of complaints to EPA.

As noted above, the QoLPS for noise defines the exceedance action level to include "frequent, recurrent noise complaints related to project activities." For this purpose, "frequent, recurrent complaints" will be defined on a case-by-case basis. However, the occurrence of such complaints will trigger the same responses described above.

8.6.4 Potential Mitigation Measures

In the event that the steps described above indicate the need for noise mitigation measures, GE will implement such measures, as appropriate. Specific actions will be selected on a case-by-case basis, and will only be used to the extent they do not impede safe operations. GE may consider the following, or other, as-yet-unidentified measures, depending on the specific cause of the noise:

- Using shrouds or noise-dampening devices on equipment;
- Changing to the use of alternative equipment at certain times of the day or night;
- Repairing or replacing stationary pieces of equipment found to be operating outside of their parameters;
- Placing small portable barriers around the noise sources or between the noise sources and receptors, where practicable, to block or reduce sound propagation;
- Installing noise-deadening construction materials to line roll-off boxes and debris staging areas and to quiet stationary/mobile equipment;
- Reducing the speed at which material-handling equipment is operated;

- Retrofitting equipment with quieter backup alarms;
- Installation or replacement of noise mufflers on engines if compatible with manufacturers' recommendations;
- Using distance and natural or artificial features to attenuate noise;
- Placing operating restrictions on equipment, as appropriate; and/or
- Making operational adjustments, including sequencing of pertinent operations, use of specific travel routes, and modification of normal backup locations.

8.7 RECORDKEEPING AND REPORTING

Records of noise measurements will be maintained, including the measurement location, time of measurement, meteorological conditions, identification of significant sound sources, model and serial numbers of equipment used, and calibration results. These results will be documented on daily noise monitoring field data sheets or by using automated data loggers during times when noise monitoring is being conducted.

As noted above, EPA will be notified of any exceedance of a noise standard within 24 hours after the discovery of the exceedance. GE will provide weekly status reports to EPA on exceedances of the noise control level and noise standards and actions taken (if any) in response to such exceedances. These reports will be provided in a tabular format in the regular weekly progress reports and may combine reportable situations that occur in the same location on consecutive days and in similar circumstances.

In addition, monthly reports will be sent to EPA (as part of the Monthly Progress Reports pursuant to the CD) summarizing the noise monitoring activities (if any) for the previous month. The summary will include (in tabular format) the date, time, location, activity being conducted and results in dBA. GE will also submit, on a monthly basis, a report on complaints, including (in tabular format) a log of any noise complaints and follow-up actions taken to resolve the complaint.

SECTION 9

LIGHTING PERFORMANCE STANDARD

This section discusses the Phase 2 QoLPS for lighting, which is applicable to both dredging operations and processing facility operations. It includes an overview of the Lighting Performance Standard, as set out in the Hudson Phase 2 QoLPS; a summary of the design analyses conducted to assess achievement of the lighting standard during the 2012 season of Phase 2 and the measures included in the Phase 2 design for that season to address lighting issues; a reference to the routine and contingency light monitoring to be conducted during 2012; a description of the response actions to be taken in the event of an exceedance of an applicable lighting standard or in response to a lighting complaint; and a description of the relevant recordkeeping and reporting procedures.

9.1 OVERVIEW OF STANDARD

To meet EPA's Productivity Performance Standard, in-river dredging and on-shore processing are expected to be performed 24 hours a day, 6 days a week, which will unavoidably require night-time lighting of work areas to protect worker safety and sufficiently illuminate equipment, transport routes, and operational areas. Lighting is measured in footcandles using a footcandle meter. The QoLPS for lighting establishes the following numerical standards for lighting, which vary depending on the type of area affected:

- For rural and suburban residential areas: 0.2 footcandle
- For urban residential areas: 0.5 footcandle
- For commercial/industrial areas: 1 footcandle

The QoLPS for lighting defines the "concern level" as an exceedance of an applicable numerical standard that can be easily and immediately mitigated, or receipt of a project-related lighting complaint. It defines the "exceedance level" as an exceedance of an applicable lighting standard that cannot be easily and immediately mitigated or as "frequent, recurrent complaints related to project activities." (Thus, as with the noise standard, the term "exceedance" is used in the lighting standard both to designate light levels above an applicable standard and as one of the two action levels in the standard. The "concern level" can include exceedances of a numerical lighting standard as well as complaints, and the "exceedance level" can include situations that do not involve exceedances of the numerical lighting standards – i.e., frequent, recurrent complaints. This section attempts to make clear which situation it is discussing.)

9.2 DESIGN ANALYSES

The Phase 2 CHASP requires that the Phase 2 design include an updated evaluation, based on Phase 1 light measurements, of light intensity generated by illumination of active dredge

areas, processing areas, loading and staging areas, administration areas, and other work areas on and near the river, considering any equipment changes anticipated for Phase 2 that could affect lighting levels. For 2012, dredging operations are not expected to cause an increase in lighting impacts over those experienced during Phase 1 and 2011. For the processing facility, as noted in Section 2.3.6 of the 2012 FDR, a lighting plan for the new size separation, gravity thickening, and coarse material staging areas – including lighting controls for those areas – will be provided to EPA for review after it has been developed. Based on that plan, the lighting impacts from the processing facility relative to those in Phase 1 and 2011 can be assessed. In addition, as discussed in Section 9.4, light monitoring will be conducted by the pertinent contractor at the initial start-up of any operation or use of equipment that is different from that used previously and could result in increased light levels.

9.3 ROUTINE CONTROL MEASURES

Based on Phase 1 performance, routine lighting control measures have been incorporated into the design of the processing facility, and will be implemented by the dredging contractor and the processing facility and rail yard operations contractors in 2012. These measures are specified in the 2012 FDR (Specification Section 02936).

9.4 ROUTINE MONITORING

During 2012 dredging and facility operations, light monitoring will be conducted by the pertinent contractor at the initial start-up of any operation that is different from that used previously and could result in increased light levels. This contractor monitoring will not be considered monitoring for compliance with the Lighting Standard; rather, if this monitoring shows a light level above a lighting standard, additional monitoring will be conducted at a location closer to the nearest receptor(s) to assess attainment of the standard. A light level above a lighting standard will be considered an exceedance of the standard only if confirmed by that follow-up monitoring. In addition, light monitoring will be conducted in response to lighting complaints, as discussed further in Section 9.5. This monitoring will be performed in accordance with methods and procedures specified in Section 8 of the Phase 2 RAM QAPP.

9.5 CONTINGENCY MONITORING

If a lighting complaint is received from the public and is verified as project-related, light monitoring will be conducted at the site of the complaint as necessary to determine whether the applicable lighting standard has been exceeded.

In the event that light monitoring, whether conducted as a follow-up to the contractor monitoring at the start-up of an operation or conducted in response to a complaint, shows an exceedance of a numerical lighting standard, additional light monitoring will be conducted, as needed, to evaluate light conditions and will be continued until achievement of the standard is confirmed.

These additional types of monitoring are referred to as contingency monitoring and are also discussed in Section 8 of the Phase 2 RAM QAPP.

9.6 CONTINGENCY/RESPONSE ACTIONS

This section describes the actions that GE will undertake in the event of an exceedance of the numerical lighting standards or in response to a lighting complaint.

9.6.1 Actions in Event of Exceedance of Lighting Standard

If light levels exceed an applicable standard at a monitor location either during the follow-up monitoring to contractor monitoring or during the monitoring in response to a complaint, GE will initially verify that the monitoring point is representative of the receptor and, if not, will attempt to conduct monitoring closer to the receptor. If light levels at a representative receptor location exceed the applicable standard and it is determined the exceedance can be easily and immediately mitigated, GE will take the following steps:

1. Notify EPA within 24 hours.
2. Investigate the cause of the lighting exceedance to verify that it is project-related.
3. If the exceedance is project-related, implement increased monitoring, as needed, as described in Section 9.5.
4. Implement mitigation measures, as appropriate (as discussed in Section 9.6.3).
5. Re-evaluate light levels at the receptor to confirm that the standard is achieved.
6. Provide a follow-up report to EPA, including a description of actions taken to resolve the exceedance, in the next weekly progress report, as described in Section 9.7.

If light levels exceed an applicable standard at a representative receptor location but it appears that the exceedance cannot be easily and immediately mitigated, GE will take the following steps:

1. Promptly notify EPA, but no later than 24 hours after discovery of the exceedance.
2. Investigate the cause of the lighting exceedance to verify that it is project-related.
3. If the exceedance is project-related, implement regular light monitoring in the affected area as described in Section 9.5.
4. Develop an approach, in coordination with EPA, for appropriate mitigation measures (as discussed in Section 9.6.3) and, upon EPA approval, implement those measures.
5. Continue the regular monitoring until the standard is achieved.
6. Provide a follow-up report to EPA, including a description of the cause of the exceedance and mitigation measures taken, in the next weekly progress report, as described in Section 9.7.

In addition, in the event of a deviation from the lighting requirements applicable to lighting on vessels, GE will follow the procedures for deviations from navigation requirements, as described in Section 10.5 below.

9.6.2 Actions in Event of Lighting Complaint

If a complaint relating to lighting is recorded, GE will take the following steps:

1. Investigate the cause of the complaint to verify that it is project-related.
2. If the complaint is project-related, conduct monitoring as necessary, to determine whether the applicable standard has been exceeded in the area referred to in the complaint.
3. If the monitoring shows an exceedance of the applicable standard, implement the applicable steps specified in Section 9.6.1 above.
4. If the monitoring does not show an exceedance of the applicable standard, report the preliminary monitoring results to EPA, work with EPA to evaluate potential mitigation measures to address the complaint, and if both GE and EPA agree, implement such measures.
5. Notify the person registering the complaint of the steps taken to resolve the complaint, and include a report on the complaint and response actions (if any) in the monthly reporting of complaints to EPA.

As noted above, the QoLPS for lighting defines the exceedance action level to include "frequent, recurrent lighting complaints relating to project activities." For this purpose, "frequent, recurrent complaints" will be defined on a case-by-case basis. However, the occurrence of such complaints will trigger the same responses described above.

9.6.3 Potential Additional Engineering Controls and Mitigation Measures

In the event that the steps described above indicate the need for additional engineering controls or mitigation measures, GE will implement such measures, as appropriate. Specific actions will be selected on a case-by-case basis, and will only be used to the extent they do not impede safe operations. GE may consider the following, or other, as-yet-unidentified measures, depending on the specific cause of the lighting issue:

- For dredging operations:
  - Repositioning of light plants, or installation of buffers, barriers or screens;
  - Repositioning of material barges to block light from the work platforms; and/or
  - Re-sequencing of the work.
- For processing facility operations:
  - Installation of screens on the edge of heavily traveled roads within the facility to block errant lights;
  - Repositioning of lights; and/or

- Installation of shields or barriers as needed between specific light sources and receptors.

9.7 RECORDKEEPING AND REPORTING

Monitoring results will be documented on light monitoring field data sheets. Records of measurements will be made, including specifics of the measurement location, time of measurement, meteorological conditions during the measurement, identification of significant light sources (including non-project-related sources such as streetlights or moonlight), and model and serial numbers of all equipment used to measure illumination.

As noted above, EPA will be notified of any exceedance of a lighting standard within 24 hours after the discovery of the exceedance. GE will provide weekly status reports to EPA on any exceedances of the lighting standards and actions taken (if any) in response to such exceedances. These reports will be provided in a tabular format in the regular weekly progress reports and may combine reportable situations that occur in the same location on consecutive days and in similar circumstances.

In addition, monthly reports will be sent to EPA (as part of the Monthly Progress Reports pursuant to the CD) summarizing the light monitoring activities (if any) for the previous month. The summary will be in tabular format and will include the monitoring results. GE will also submit, on a monthly basis, a report on complaints, including (in tabular format) a log of any lighting complaints and follow-up actions taken to resolve the complaint.

SECTION 10

NAVIGATION PERFORMANCE STANDARD

This section discusses the Phase 2 QoLPS for navigation. This standard is applicable to dredging operations, including debris removal, dredging, dredged material transport, and backfilling/capping of dredged areas. It sets forth the general requirements of the standard, the actions that GE will take to comply with the standard during the 2012 dredging season, the routine notice and monitoring requirements, contingency actions in the event of a deviation from the applicable requirements, requirements for responding to complaints, and reporting requirements.

10.1 OVERVIEW OF STANDARD

The river will be used by public, commercial, and project vessels during work activities. EPA developed the QoLPS for navigation, in consultation with the New York State Canal Corporation (NYS Canal Corporation), to regulate project-related vessel movement on the river. The Navigation Performance Standard requires that project vessels comply with the applicable provisions of federal and state navigation laws, rules and regulations. In addition, it contains a number of other requirements relating to the relationship between project-related vessel traffic and non-project vessels. These requirements include:

- Restricting access to work areas and providing safe access around them in the navigational channel, to the extent practical;
- Notifying the NYS Canal Corporation of in-river project activities and providing information to the NYS Canal Corporation and/or United States Coast Guard (USCG) so as to allow them to issue Notices to Mariners;
- Providing the public with a schedule of anticipated project activities;
- Scheduling project river traffic so that non-project traffic is not unnecessarily hindered, while at the same time allowing efficient performance of the project and considering that project vessels will be considered commercial vessels for navigation purposes;
- Coordinating lock usage with the NYS Canal Corporation and its lock operators; and
- Establishing temporary aids to navigation, such as lighting, signs and buoys, to maintain safe and efficient vessel movement.

The Navigation Performance Standard includes two action levels – concern and exceedance levels, as described below.

- The concern level occurs if there is a deviation from the requirements described above and the deviation can be easily mitigated, or if a project-related navigation complaint is received from the public.

- The exceedance level occurs if remedial activities unnecessarily hinder overall non-project-related vessel movement and create project-related navigation interferences, or if there are frequent recurrent complaints from the public that project activities are unnecessarily hindering non-project vessel movement.

The actions to be taken during the 2012 season to comply with the navigation performance standard are described below. These actions are discussed further in the 2012 FDR.

10.2 DESIGN ANALYSES AND ROUTINE CONTROL MEASURES

To meet the QoLPS for navigation, this project has been designed and will be implemented to maximize safety and productivity and to avoid unnecessary disruption of non-project navigation, while allowing efficient performance of the project. Specifically, the following actions will be implemented during the 2012 season to comply with the QoLPS for navigation (see also Section 3.10.6 of the 2012 FDR):

- **Obstructions:** GE will, to the extent practical, consistent with meeting the goals of the project and complying with the other performance standards, comply with 33 U.S. Code Ch. 9 § 409, which prohibits tying up or anchoring vessels or other craft in navigable channels in such a manner as to prevent or obstruct the passage of other vessels or craft.
- **Vessel lighting and signals:** GE will comply with the following requirements relating to the type, size, location, color and use of lighting on all ships:
  - 33 CFR §§ 84-88, Annex I – requirements for positioning and spacing of lights, location of direction-indicating lights for dredges, and screens, color, shape and intensity of lights;
  - 33 CFR §§ 84-88, Annex V – additional requirements for lighting of moored barges and dredge pipelines;
  - NYS Canal Corporation regulations at 21 NYCRR 151.23 – lighting requirements for moored floats;
  - 33 CFR § 86, Annex III – requirements for technical details of sound signals;
  - 33 CFR § 87, Annex IV – requirements for distress signals; and
  - NYS Canal Corporation regulations at 21 NYCRR 151.6 (draft marking on floats), 151.13 (buoys and lights displaced), 151.21 (warning signals approaching bends) and 151.24 (aids to navigation)
- **Piloting:** GE will comply with the following requirements regarding the piloting and movement of vessels by qualified and properly trained personnel:
  - 33 CFR § 88, Annex V – requirements for public safety activities, obtaining copies of rules and law enforcement vessels; and

  - NYS Canal Corporation regulations at 21 NYCRR 151.1, 151.7, 151.8, 151.9, 151.15, 151.16, 151.17, 151.18, 151.19 and 151.22 – piloting requirements.

- **Marine traffic control:** All project vessels will be tracked via radio dispatch to schedule and control traffic in a way that minimizes interference with non-project vessels while optimizing productivity. For purposes of navigation, project-related vessels will be considered commercial vessels.
- **Use of lock:** Use of Lock 7 on the Champlain Canal will be coordinated with the NYS Canal Corporation and will be reduced by staging and routing project support vessels (i.e., vessels other than barges and associated tugs) from the Work Support Marina on West River Road in Moreau.
- **Restricting access:** Non-project access to active work areas will be restricted in coordination with the NYS Canal Corporation. Mariner notification will be used, and buffer zones and temporary aids (e.g., lighting, signage, etc.) will be established to allow safe passage of non-project traffic around active work areas.

  A Work Support Marina has been constructed in the Town of Moreau on the west side of the river, across the river from canal Lock 7. This facility will be used in 2012 to support dredging-related project vessels as well as those associated with monitoring activities. The use of the Work Support Marina will reduce traffic at Lock 7, thereby reducing project-related navigation impacts. Dredging equipment and dredged sediments will not be transported to or processed at this marina.

  If closure of any portion of the navigation channel is required during dredging or related operations, EPA and the NYS Canal Corporation will be consulted.

- **Temporary aids to navigation:** Safe and efficient navigation near active project areas will be facilitated by use of buffer zones and temporary aids to navigation, including lighting, signs and other aids specified by the NYS Canal Corporation and USCG.

10.3 ROUTINE NOTICES

In addition to the activities described above, GE will provide routine notices during dredging, to include the following:

- GE will provide the NYS Canal Corporation and USCG with verbal and written notices regarding project schedules. This will allow those agencies to issue Notices to Mariners regarding anticipated access restrictions, project vessel scheduling, lock scheduling, contingencies or other information.
- GE will provide the public with a schedule of anticipated project activities. Methods for informing the public of anticipated actions may include the following, where appropriate:
  - Communications with lock operators during lock usage;

- Broadcasting on appropriate marine frequencies during in-river activities to notify lock operators and other mariners of transient activities that may affect navigation;
- Posting notices at marinas, public boat launches, and locks;
- Providing interested commercial and recreational user groups with a summary of anticipated activities on an annual basis prior to initiating in-river activities; and
- Posting information about in-river activities on the project website.

10.4 ROUTINE MONITORING

Marine traffic will be routinely monitored after 2012 dredging operations begin. This routine monitoring will involve the recording in daily logs of information about river navigation activities in the vicinity of in-river project operations, along with any resulting navigation issues. The routine monitoring will include:

- Periodic monitoring of in-river activities that may have an impact on navigation of the river by commercial and recreational watercraft.
- Monitoring vessel traffic and compiling daily logs of river navigation activities in the vicinity of in-river project activities along with any resulting navigation issues.

A monthly navigation report will be submitted by GE to EPA and the NYS Canal Corporation, as described in Section 10.6 below.

10.5 CONTINGENCY/RESPONSE ACTIONS

This section describes the actions that GE will take in the event that in-river operations deviate from applicable federal or state navigation regulations listed above or from the design plans relating to navigation, or in the event that a navigation-related complaint is received.

10.5.1 Actions in Event of Deviation at Concern Level

If on-river operations deviate from the applicable federal and state navigation regulations listed in the QoLPS for navigation or from the design plans relating to navigation, and GE determines that such deviation can be easily and immediately mitigated, GE will take the following steps:

1. Promptly notify EPA and the NYS Canal Corporation, but no later than 24 hours after discovery of the deviation.
2. Implement mitigation measures as appropriate (as discussed in Section 10.5.4 below).
3. Submit a follow-up report to EPA and the NYS Canal Corporation, including a summary of the navigation issues and mitigation actions taken, in the next weekly progress report, as described in Section 10.6.

10.5.2 Actions in Event of Deviation at Exceedance Level

If on-river operations deviate from the applicable federal and state navigation regulations listed in the QoLPS for navigation or from the design plans relating to navigation, and it appears that such deviation cannot be easily and immediately mitigated, GE will take the following steps:

1. Notify EPA and the NYS Canal Corporation immediately.
2. Identify the cause of the deviation.
3. Develop an approach, in coordination with EPA and the NYS Canal Corporation, for mitigation measures (as discussed in Section 10.5.4) and, upon EPA approval, implement those measures.
4. Submit a follow-up report to EPA and the NYS Canal Corporation, including a description of the cause(s) of the navigation problem(s) and mitigation actions taken, in the next weekly progress report, as described in Section 10.6.

10.5.3 Actions in Event of Navigation Complaint

If a navigation complaint is recorded, GE will take the following steps:

1. Investigate the cause of the complaint to verify that it is project-related.
2. If the complaint is project-related, conduct an investigation to determine whether the project is in compliance with all substantive federal and state navigation requirements and if project activities have interfered with other river traffic.
3. Notify the NYS Canal Corporation of the complaint and consult with the NYS Canal Corporation, if necessary, in the investigation.
4. If it is determined that the project is not in compliance with all substantive federal and state navigation requirements or that GE has not taken appropriate steps to minimize interference with river traffic, implement the applicable steps described above, including notification to EPA and the NYS Canal Corporation, implementation of mitigation measures, and submission of a follow-up report.
5. If it is determined that the project is in compliance with all substantive federal and state navigation requirements and that GE has taken appropriate steps to minimize interference with river traffic, work with EPA, in coordination with the NYS Canal Corporation, to evaluate potential measures to address the complaint, and if both GE and EPA agree, implement such measures.
6. Notify the person registering the complaint of the steps taken to resolve the complaint, and include a report on the complaint and response actions (if any) in the monthly reporting of complaints to EPA.

As noted above, the QoLPS for navigation defines the "exceedance level" to include "frequent, recurrent complaints indicating project activities are unnecessarily hindering overall

non-project vessel movement." Such complaints will be defined on a case-by-case basis. These complaints will be handled in the same manner described above.

10.5.4 Potential Mitigation Measures

In the event that mitigation measures are required to address a deviation from applicable federal or state navigation regulations, the mitigation measures will consist of taking the necessary steps to comply with those regulations.

In the event that the steps described above indicate the need for additional mitigation measures, GE will implement such measures, as appropriate. Selection of specific actions will be determined on a case-by-case basis. GE may consider the following, or other, as-yet-unidentified measures, depending on the specific circumstances:

- Spacing in-river vessels to minimize channel encroachment;
- Repairing or replacing aids to navigation; and/or
- Revising the schedule for work in dredge areas and/or times of project vessel and equipment movement in the river to reduce impacts on non-project navigation, including performing certain activities during off-peak hours, if practical.

10.6 REPORTING

As discussed above, if there is a deviation from the applicable federal and state navigation regulations listed in the QoLPS for navigation or from the design plans relating to navigation, GE will notify EPA and the NYS Canal Corporation within 24 hours for deviations at the concern level and immediately for deviations at the exceedance level. GE will provide weekly status reports to EPA on any such deviations at either the concern or the exceedance level, describing the cause of the problem and actions taken (if any) in response to such deviations. These reports will be provided in a tabular format in the regular weekly progress reports and may combine reportable situations that occur in the same location on consecutive days and in similar circumstances.

In addition, during in-river operations, GE will submit monthly navigation reports to EPA and the NYS Canal Corporation (as part of the CD Monthly Progress Reports), summarizing navigation activities for the previous month, including daily records, as well as a log of navigation compliance and follow-up actions. It will also identify any in-river project activities not previously identified that may significantly affect navigation by commercial and recreational vessels. In addition, a report on complaints in tabular format and including a log of navigation complaints and follow-up actions taken to resolve the complaints will be included in the separate monthly report on complaints.

SECTION 11

SUBSTANTIVE WATER QUALITY REQUIREMENTS FOR DISCHARGES TO CHAMPLAIN CANAL AND BOND CREEK

This section addresses the WQ Requirements for discharges from the processing facility to surface water. Such discharges will occur at three outfalls. Treated water from sediment dewatering operations and Type I storm water (i.e., storm water draining from areas where PCB-containing sediment is managed) will be discharged at Outfall 001 to the Champlain Canal (land cut above Lock 7). During periods of overflow of the sedimentation basins at the processing facility, non-contact (Type II) storm water will be discharged from Outfalls 002 and/or 003 to Bond Creek. WQ Requirements for the discharge from Outfall 001 were set forth in the *Substantive Requirements of State Pollutant Discharge Elimination System Permit for Potential Discharges to Champlain Canal (land cut above Lock 7)* and *Substantive Requirements of State Pollutant Discharges to the Hudson River*, which were provided by EPA to GE on January 7, 2005 (EPA 2005). EPA provided GE with the substantive requirements for the Type II storm water discharges to Bond Creek on September 14, 2006 (EPA 2006). All of these requirements will continue to apply to Phase 2 of the RA and thus will be followed during processing facility operations in 2012.

This section describes the effluent limits for these discharges, as well as the associated monitoring requirements, response actions, and reporting requirements.

11.1 EFFLUENT LIMITATIONS

11.1.1 Effluent Limitations for Dewatering Facility (Outfall 001)

During the period beginning with the effective date of discharge (EDD) and lasting until the completion of the project, the discharge of treated water from the sediment dewatering operations, as well as Type I storm water, through Outfall 001 to the Champlain Canal (land cut above Lock 7) will be subject to a set of effluent limits and associated monitoring requirements specified in the January 2005 documents identified above. Table 11-1 summarizes the effluent limits for this discharge to the Champlain Canal.

Table 11-2 lists the permitted discharges from Outfall 001 for chromium (Cr), cadmium (Cd), lead (Pb) and copper (Cu) concentrations (mg/L) and mass loadings (lbs/day) at various flow rates from 0.10 MGD to 15 MGD.

Table 11-1
Effluent Limits for Discharge from Outfall 001 to the Champlain Canal

Outfall Number and Parameter	Discharge Limitations		Units	Minimum Monitoring Requirements		Footnote
	Daily Avg.	Daily Max		Measurement Frequency	Sample Type	
Outfall 001 - Treated Remediation Discharge for Hudson River PCB Site:						
Flow	Monitor	Monitor	GPD	Continuous	Meter	
pH (range)	6.0 to 9.0		SU	Monthly	Grab	
Solids, Total Suspended	Monitor	50	mg/L	Weekly	Grab	9
Total Organic Carbon	Monitor	Monitor	mg/L	Weekly	Grab	9
PCBs, Aroclor 1016	Monitor	0.3	µg/L	Weekly	Runtime composite	2,9
PCBs, Aroclor 1221	Monitor	0.3	µg/L	Weekly	Runtime composite	2,9
PCBs, Aroclor 1232	Monitor	0.3	µg/L	Weekly	Runtime composite	2,9
PCBs, Aroclor 1242	Monitor	0.3	µg/L	Weekly	Runtime composite	2,9
PCBs, Aroclor 1248	Monitor	0.3	µg/L	Weekly	Runtime composite	2,9
PCBs, Aroclor 1254	Monitor	0.3	µg/L	Weekly	Runtime composite	2,9
PCBs, Aroclor 1260	Monitor	0.3	µg/L	Weekly	Runtime composite	2,9
PCBs, Total	Monitor	Monitor	µg/L	Weekly	Runtime composite	2,9
Cadmium, Total	Monitor	0.04	mg/L	Weekly	Grab	3,9
		0.62	lb/day			
Chromium, Total	Monitor	0.21	mg/L	Weekly	Grab	3,9
		18.9	lb/day			
Copper, Total	Monitor	0.136	mg/L	Weekly	Grab	3,9
		0.75	lb/day			
Lead, Total	Monitor	0.038	mg/L	Weekly	Grab	3,9
		0.31	lb/day			
Mercury, Total	Monitor	0.0002	mg/L	Weekly	Grab	4,9
Dissolved Oxygen	Monitor	Monitor	mg/L	Weekly	Grab	8

Additional Conditions and Footnotes:

1. During the period beginning with the EDD and lasting until the completion of the project, discharges from the treatment facility through Outfall 001 will be limited and monitored by the operator. EPA will not require a modification to the PCB method or treatment technologies that are not being required at other facilities by NYSDEC.
2. PCBs:
   A. GE will monitor this discharge for PCBs using EPA laboratory Method 608. The laboratory must make all reasonable attempts to achieve the Minimum Detection Levels (MDLs) of 0.065 µg/L for each of the subject Aroclors. Monitoring requirements may be modified in the future if EPA approves a method different from Method 608.
   B. Non-detect at the MDL of 0.065 µg/L is the discharge goal. GE will report all values above the MDL. If the level of any Aroclor is above its listed MDL, GE will evaluate the treatment system and identify the cause of the detectable level of PCBs in the discharge. Following three consecutive months that include analytical results above any MDL, GE will prepare an approvable report identifying the measures undertaken to eliminate the detections and propose additional steps to be taken to eliminate the recurrence of such detections. This report will be submitted to EPA within 28 days following receipt of sampling results from the third monitoring period.
   C. If EPA determines that effluent monitoring results above the MDL of 0.065 µg/L can be prevented by implementation of additional measures, GE will propose such measures for EPA review and approval, and then implement the approved measures.
   D. The treatment technology for this discharge shall be the maximum feasible treatment technology for treatment of PCBs. As treatment technology improvements become available, GE will review the available technology and submit for EPA approval, plans to improve the treatment technology and/or Best Management Practices employed to remove maximum feasible amount of PCBs from the wastewater discharge.
   E. This limit is a phased Total Maximum Daily Loading limit, prepared in accordance with 6 NYCRR 702.16(b). Discharge is not authorized until such time as an engineering submission showing the method of treatment is approved by EPA. The discharge rate may not exceed the effective or design treatment system capacity.
3. Effluent limits for these metals include both a maximum concentration and a maximum mass flow rate. The actual limit will be either the maximum concentration or the mass flow rate, if the discharge flow rate from the outfall is such that a lower concentration is necessary to maintain mass flows below the allowable maximum. The allowable concentrations and corresponding mass flow rates are provided in Table 11-2, for discharge flows from 0.1 MGD to 15.0 MGD
4. Mercury, Total will be analyzed using EPA Method 1631.
5. All monitoring data, engineering submissions and modification requests must be submitted to EPA, with copies to NYSDEC.
6. Only site-generated wastewater related to the Hudson River PCBs Site Remedial Action is authorized for treatment and discharge.
7. Both concentration (mg/L or µg/L) and mass loadings (lbs/day) must be reported for all parameters except flow and pH.
8. Any use of corrosion/scale inhibitors or biocidal-type compounds used in the treatment process must be approved by EPA prior to use.
9. In accordance with CERCLA Sections 121(d)(2) and 121(e), no permits are required for on-site CERCLA response actions. This discharge and the administration of this discharge will comply with the substantive requirements of 6 NYCRR Part 750.

Table 11-2
Outfall 001 Discharge Limits for Flows Above 0.1 MGD

Permit Flow (MGD)	Cr	Load	Cd	Load	Pb	Load	Cu	Load
0.100	0.210	0.175	0.040	0.033	0.038	0.032	0.136	0.113
0.300	0.210	0.525	0.040	0.100	0.038	0.095	0.136	0.340
0.500	0.210	0.876	0.040	0.167	0.038	0.158	0.136	0.567
0.700	0.210	1.226	0.040	0.234	0.038	0.222	0.128	0.750
0.900	0.210	1.576	0.040	0.300	0.038	0.285	0.100	0.750
1.100	0.210	1.927	0.040	0.367	0.034	0.310	0.082	0.750
1.300	0.210	2.277	0.040	0.434	0.029	0.310	0.069	0.750
1.500	0.210	2.627	0.040	0.500	0.025	0.310	0.060	0.750
1.700	0.210	2.977	0.040	0.567	0.022	0.310	0.053	0.750
1.900	0.210	3.328	0.039	0.620	0.020	0.310	0.047	0.750
2.100	0.210	3.678	0.035	0.620	0.018	0.310	0.043	0.750
2.300	0.210	4.028	0.032	0.620	0.016	0.310	0.039	0.750
2.500	0.210	4.379	0.030	0.620	0.015	0.310	0.036	0.750
2.700	0.210	4.729	0.028	0.620	0.014	0.310	0.033	0.750
2.900	0.210	5.079	0.026	0.620	0.013	0.310	0.031	0.750
3.000	0.210	5.254	0.025	0.620	0.012	0.310	0.030	0.750
3.500	0.210	6.130	0.021	0.620	0.011	0.310	0.026	0.750
4.000	0.210	7.006	0.019	0.620	0.009	0.310	0.022	0.750
4.500	0.210	7.881	0.017	0.620	0.008	0.310	0.020	0.750
5.000	0.210	8.757	0.015	0.620	0.007	0.310	0.018	0.750
5.500	0.210	9.633	0.014	0.620	0.007	0.310	0.016	0.750
6.000	0.210	10.508	0.012	0.620	0.006	0.310	0.015	0.750
6.500	0.210	11.384	0.011	0.620	0.006	0.310	0.014	0.750
7.000	0.210	12.260	0.011	0.620	0.005	0.310	0.013	0.750
7.500	0.210	13.136	0.010	0.620	0.005	0.310	0.012	0.750
8.000	0.210	14.011	0.009	0.620	0.005	0.310	0.011	0.750
8.500	0.210	14.887	0.009	0.620	0.004	0.310	0.011	0.750
9.000	0.210	15.763	0.008	0.620	0.004	0.310	0.010	0.750
9.500	0.210	16.638	0.008	0.620	0.004	0.310	0.009	0.750
10.000	0.210	17.514	0.007	0.620	0.004	0.310	0.009	0.750
10.500	0.210	18.390	0.007	0.620	0.004	0.310	0.009	0.750
11.000	0.206	18.900	0.007	0.620	0.003	0.310	0.008	0.750
11.500	0.197	18.900	0.006	0.620	0.003	0.310	0.008	0.750
12.000	0.189	18.900	0.006	0.620	0.003	0.310	0.007	0.750
12.500	0.181	18.900	0.006	0.620	0.003	0.310	0.007	0.750
13.000	0.174	18.900	0.006	0.620	0.003	0.310	0.007	0.750
13.500	0.168	18.900	0.006	0.620	0.003	0.310	0.007	0.750
14.000	0.162	18.900	0.005	0.620	0.003	0.310	0.006	0.750

Permit Flow (MGD)	Cr	Load	Cd	Load	Pb	Load	Cu	Load
14.500	0.156	18.900	0.005	0.620	0.003	0.310	0.006	0.750
15.000	0.151	18.900	0.005	0.620	0.002	0.310	0.006	0.750

Notes:

1. Mass loadings, in lb/day and concentrations, in mg/L, for chromium (Cr), cadmium (Cd), lead (Pb) and copper (Cu) for various discharge flow rates to the Champlain Canal.

EPA used the following basis for calculating the mass equivalent of the listed concentrations for cadmium, chromium, lead and copper which may be discharged up to the maximum mass flow rate listed.

- Load [lb/day] = [flow, MGD] x [concentration, ppm] x [8.34]

For example, 0.21 mg/L of chromium may be discharged at any discharge flow rate up to 10.8 MGD, which equates to 18.9 lbs/day at 0.21 mg/L. At discharge flow rates greater than 10.8 MGD, GE may discharge no more than 18.9 lbs/day of chromium (resulting in proportionally lower concentrations). Compliance for the metals in Table 11-2 will be determined by comparing the measured concentration in the effluent against the allowable concentration using the actual flow rates of discharge in Outfall 001.

11.1.2 Effluent Limitations for Non-Contact Storm Water through Outfalls 002 and 003

During the period beginning with the EDD and lasting until the completion of the project, the discharges from Outfalls 002 and 003 to Bond Creek will be limited and monitored as specified in Table 11-3 and Table 11-4.

Table 11-3
Effluent Limitations for Non-Contact Storm Water Discharge from Outfall 002

Outfall Number and Parameter	Discharge Limitations		Units	Minimum Monitoring Requirements		Footnote
	Daily Avg.	Daily Max		Measurement Frequency	Sample Type	
Outfall 002 – Storm Water Runoff Discharged from Storm Water Basin A:						
Flow	Monitor	Monitor	GPD	Daily	Estimate	
pH (range)	6.0 to 9.0		SU	Monthly	Grab	
Solids, Total Suspended	Monitor	50	mg/L	Once/2 Weeks	Grab	
Solids, Settleable	Monitor	0.1	ml/L	Daily	Grab	
Oil & Grease	Monitor	15	mg/L	Monthly	Grab	
Cadmium, Total	Monitor	13	µg/L	Once/2 Months	Grab	
Chromium, Total	Monitor	210	µg/L	Once/2 Months	Grab	
Copper, Total	Monitor	60	µg/L	Once/2 Months	Grab	
Lead, Total	Monitor	28	µg/L	Once/2 Months	Grab	
Mercury, Total	Monitor	0.20	µg/L	Once/2 Months	Grab	
Aroclor 1016	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1221	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1232	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1242	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1248	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1254	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1260	Monitor	0.30	µg/L	Monthly	Grab	2

Table 11-4
Effluent Limitations for Non-Contact Storm Water Discharge from Outfall 003

Outfall Number and Parameter	Discharge Limitations		Units	Minimum Monitoring Requirements		Footnote
	Daily Avg.	Daily Max		Measurement Frequency	Sample Type	
Outfall 003 – Storm Water Runoff Discharged from Storm Water Basin B:						
Flow	Monitor	Monitor	GPD	Daily	Estimate	
pH (range)	6.0 to 9.0		SU	Monthly	Grab	
Solids, Total Suspended	Monitor	50	mg/L	Once/2 Weeks	Grab	
Solids, Settleable	Monitor	0.1	ml/L	Daily	Grab	
Oil & Grease	Monitor	15	mg/L	Monthly	Grab	
Cadmium, Total	Monitor	13	µg/L	Once/2 Months	Grab	
Chromium, Total	Monitor	210	µg/L	Once/2 Months	Grab	
Copper, Total	Monitor	60	µg/L	Once/2 Months	Grab	
Lead, Total	Monitor	28	µg/L	Once/2 Months	Grab	
Mercury, Total	Monitor	0.20	µg/L	Once/2 Months	Grab	
Aroclor 1016	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1221	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1232	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1242	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1248	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1254	Monitor	0.30	µg/L	Monthly	Grab	2
Aroclor 1260	Monitor	0.30	µg/L	Monthly	Grab	2

Additional Conditions and Footnotes:

1. Bond Creek is water Index Number H-319 and is classified as a Class C water body.
2. PCBs:
   A. GE must monitor this discharge for PCBs using EPA laboratory Method 608. The laboratory must make all reasonable attempts to achieve the Minimum Detection Levels (MDLs) of 0.065 µg/L for each of the subject Aroclors. Monitoring requirements may be modified in the future if EPA approves a method different from Method 608.
   B. Non-detect at the MDL of 0.065 µg/L is the discharge goal. GE shall report all values above the MDL. If the level of any Aroclor is above its listed MDL, GE must evaluate the sedimentation basins and identify the cause of the detectable level of PCBs in the discharge. Following two consecutive sampling events that include analytical results above any MDL, GE shall prepare an approvable report identifying the measures undertaken to eliminate the detections and propose additional steps to be taken to eliminate the recurrence of such detections. This report shall be submitted to EPA within 45 days following receipt of sampling results from the second monitoring period.

C. If EPA determines that effluent monitoring results above the MDL of 0.065 µg/L can be prevented by implementation of additional measures, GE shall propose such measures for EPA review and approval, and then implement the approved measures.

This limit is a phased Total Maximum Daily Loading limit, prepared in accordance with 6 NYCRR 702.16(b).

3. All monitoring data, engineering submissions and modification requests must be submitted to EPA, with copies to NYSDEC.
4. Only site-generated Type II storm water runoff related to the Hudson River PCBs Site Remedial Action is authorized for discharge through Outfalls 002 and 003.
5. Any use of corrosion/scale inhibitors or biocidal-type compounds used in the treatment process must be approved by EPA prior to use.
6. In accordance with CERCLA Sections 121(d)(2) and 121(e), no permits are required for on-site CERCLA response actions. This discharge and the administration of this discharge shall comply with the substantive requirements of 6 NYCRR Part 750.
7. Monitoring of outfalls 002 and 003 is not required during the period beginning 2 weeks after the cessation of sediment management activities in the Fall/Winter and ending when these activities resume in the Spring.
8. Compliance with the substantive requirements of State Pollutant Discharge Elimination System (SPDES) general permits GP-02-01 and GP-0-06-002 shall also be maintained.
9. Compliance with the Substantive Requirements of State Pollutant Discharge Elimination System Permit for Potential Discharges to Bond Creek is explicitly conditioned on the provisions contained in Exhibits 1 and 2 of Attachment A, GE Response to Comment 5 for Contract 3 dated September 11, 2006.
10. Mercury, Total shall be analyzed using EPA Method 1631.

11.2 DISCHARGE MONITORING

The discharge monitoring program is described in Section 2.6 of the Phase 2 RAM QAPP, and is briefly summarized below.

11.2.1 Discharge Monitoring from the Dewatering Facility (Outfall 001)

Outfall 001 discharge monitoring will take place via sample taps in the treated water discharge line located in the eastern corner of the water treatment building. GE will monitor this discharge for the parameters listed in Tables 11-1 through 11-3. These include PCBs, mercury, chromium, cadmium, lead, and copper, as well as flow, pH, TSS, total organic carbon, and DO. The monitoring of these discharges will be performed in accordance with the requirements specified for Outfall 001 in Section 2.6 of the Phase 2 RAM QAPP, and the analyses will be conducted in accordance with the applicable methods listed in Section 2.7 of that RAM QAPP. For PCBs, GE will instruct the laboratory to make all reasonable attempts to achieve a Minimum Detection Level (MDL) of 0.065 µg/L for each Aroclor.

During the off-season following 2012 operations, beginning after the unloading of the last barge in 2012, the frequency of sampling the Outfall 001 discharge will be reduced from weekly to monthly, the collection of 24-hour composite samples for PCB analysis will be replaced by the collection of manual grab samples, and the sampling and analysis for metals will be suspended. These modifications will extend until the first barge is unloaded in the 2013 dredging season.

11.2.2 Discharge Monitoring for Non-Contact Storm Water (Outfalls 002 and 003)

Outfalls 002 and 003 discharge monitoring will take place at the discharges from the two non-contact storm water sedimentation basins. GE will monitor these discharges for the parameters listed in Tables 11-4 and 11-5 in accordance with the discharge monitoring requirements set forth for these outfalls in Section 2.6 of the Phase 2 RAM QAPP, using the applicable analytical methods listed in Section 2.7 of that RAM QAPP.

During the off-season following 2012 operations, beginning two weeks after the cessation of sediment management activities at the processing facility, monitoring of Outfalls 002 and 003 will be suspended until sediment management activities begin again in spring 2013.

11.3 RESPONSE ACTIONS

This section specifies the response actions that GE will take during 2012 in response to an exceedance of any of the effluent limitations set forth in Section 11.1.

11.3.1 Response Actions for Dewatering Facility (Outfall 001)

In the event of an exceedance of the discharge limitations for Outfall 001 (which includes a detection of Aroclors above the MDL of 0.65 µg/L), GE will perform an engineering evaluation and propose, for EPA approval, appropriate corrective action in an Engineering Evaluation Report to be submitted to EPA and NYSDEC. The corrective action for water passing through the treatment system and Outfall 001 may include various changes and/or modifications such as:

- Additional testing to assess the problem;
- Carbon change-out;
- Repairs to equipment;
- Operational modifications (e.g., modifying additive dosages, more frequent backwashing, lead/lag changes of activated carbon, reducing flow rate);
- Modifications to or replacement of treatment equipment; and/or
- If necessary, temporary cessation of operations.

In addition, if the level of any PCB Aroclor is above the MDL, GE will perform an investigation into the cause of the detectable level of PCBs in the discharge and provide the results in a report to EPA. If three consecutive months include PCB results above the MDL, GE will prepare and submit to EPA a report that identifies the corrective measures undertaken and proposes additional steps to eliminate the recurrence of such detections. GE will submit the report to EPA within 28 days from GE's receipt of the sampling results from the third monitoring period. GE will implement any additional corrective measures in accordance with an EPA-approved report recommending such corrective measures.

11.3.2 Response Actions for Non-Contact Water Discharge (Outfalls 002 and 003)

In the event of an exceedance of the discharge limitations for Outfalls 002 and 003 (which include a detection of Aroclors above the MDL of 0.065 µg/L), GE will perform an engineering evaluation and propose, for EPA approval, appropriate corrective action in an Engineering Evaluation Report, to be submitted to EPA and NYSDEC. The corrective action for non-contact water passing through the retention ponds and Outfalls 002 and 003 may include additional testing to assess the problem (with notification to EPA of the anticipated additional testing), operational modifications, or, if necessary, temporary cessation of operations.

In addition, if the level of any PCB Aroclor is above the MDL, GE will perform an investigation into the cause of the detectable level of PCBs in the discharge and provide the results in a report to EPA. If two consecutive sampling events include PCB results above the MDL, GE will prepare and submit to EPA a report that identifies the corrective measures undertaken and proposes additional steps to eliminate the recurrence of such detections. GE will submit the report to EPA within 45 days from GE's receipt of the sampling results from the second monitoring period. In the event of a PCB detection (of > 0.065 µg/L for any Aroclor) in two consecutive monitoring periods, GE will prepare and submit to EPA a separate report. In accordance with a letter from GE to EPA dated September 11, 2006 (GE 2006) (*GE Response to EPA Comment 5 for Contract 3*), this separate report will identify the monitoring data, engineering submissions and modification requests and corrective measures undertaken, and will propose additional steps to eliminate the recurrence of such detections. GE will implement any additional corrective measures in accordance with EPA-approved report recommending such corrective measures.

11.4 REPORTING

GE will submit to EPA and NYSDEC a monthly report that includes the routine monitoring results for dewatering facility discharges to the Champlain Canal (Land Cut above Lock 7) through Outfall 001 and non-contact water discharges to Bond Creek through Outfalls 002 and 003. Both concentration [mg/L or µg/L] and mass loadings [lbs/day] will be reported for parameters with mass loading limits. For Outfalls 002 and 003, flow and settleable solids results will be available to EPA daily. The other sample parameters will be available to EPA upon receipt from the laboratory. Flow to Outfall 001 will be recorded continuously by the automatic data acquisition system.

In the event of an exceedance of the discharge limitations or PCB detection, GE will notify EPA upon receipt of the data showing the exceedance or PCB detection. In such cases, GE will also prepare and submit to EPA and NYSDEC a separate Engineering Evaluation Report, as described in Sections 11.3.1 and 11.3.2 of this 2012 PSCP for Outfall 001 and Outfalls 002/003, respectively. GE will provide weekly status reports to EPA on any such exceedances of the discharge limitations or PCB detections, including a description of any corrective actions taken. These reports will be provided in a tabular format in the regular weekly progress reports and may

combine reportable situations that occur in the same location on consecutive days and in similar circumstances.

All monitoring data and reports, engineering submissions, and modification requests will be submitted to EPA with a copy sent to NYSDEC.

SECTION 12

REFERENCES

Anchor QEA. 2012. *2012 Remedial Action Monitoring Quality Assurance Project Plan*. Prepared for General Electric Company. February.

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United States Environmental Protection Agency and General Electric Company. 2005. Consent Decree in *United States v. General Electric Company*, Civil Action No. 05-cv-1270, lodged in United States District Court for the Northern District of New York on October 6, 2005 and entered by court on November 2, 2006.