Introduction

The CPG is providing the attached responses to the EPA comments on the Lower Passaic River Remedial Alternatives Screening (RAS) memorandum and the Remedial Alternatives Evaluation (RAE) memorandum received on 9/29/16. Because some supporting information, such as revised LPRSA model outputs and final risk assessment (i.e., BHHRA and BERA) is not yet available, this submission is considered a partial and preliminary response, but is provided in good faith to support further discussions with the Region and resolution of our differences.

As noted in the response to comments, the CPG intends to follow the EPA's directives in revising the two documents. However, there are several key areas where the CPG does not agree with the EPA's directives. In these cases, the CPG will document the disagreements where appropriate and note where the CPG contends that the EPA directives are in conflict with statutes, guidance, policy, sound engineering principles, field experience and/or site-specific data. The CPG hopes that by providing EPA with the details on areas of disagreement, we will be able to resolve our differences and work towards EPA's objective of an approved 17-mile FS by the 1st quarter of FY 2019. Given the CPG's disagreements with some of EPA's key directives on the two memoranda, the CPG reserves all rights under the May 2007 AOC in revising and completing the FS Technical Memoranda and other deliverables related to the 17-mile RI/FS.

Achieving EPA's goal of an approved 17-mile RI/FS during the 1st quarter of FY 2019 will require the CPG and EPA to participate in a streamlined process for the FS. Completion of the FS, including the final content of the RAS and RAE memoranda, depends upon finalization and EPA approval of the Remedial Investigation report, the modeling, and the human health and ecological risk assessments. This process will require a substantial amount of time. Therefore, if the FS process itself is not streamlined, it will be difficult to meet a 1st quarter of FY 2019 timeframe for final approval of the 17-mile RI/FS

In its written response to a previous (January 2014) CPG request to reconsider the AOC requirements for the FS technical memoranda, the Region stated its support for a streamlined approach to the FS deliverables. The CPG is certainly willing to participate in a more efficient FS process, and looks forward to working with the Region to develop this process. In consideration of this process, the CPG suggests a collaborative review of the AOC to identify those deliverables that may be eliminated, including whether the RAE memo needs to be finalized. Additionally, the CPG requests that the Region carefully consider its desire to have the model peer-reviewed, and to evaluate the extent to which Partner Agency review, and in some cases re-review, of the deliverables is needed.

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General Responses to Comments

Although there were a large number of individual comments on the RAS and RAE memoranda, many of the individual comments are related to a few key subjects. To simplify the Region's review process, the CPG is providing the following general responses on these key subjects:

1. RALs and Remedial Alternatives: The CPG proposes to develop a set of alternatives using a range of RALs for 2,3,7,8-TCDD, total PCBs, and possibly other selected risk drivers to be determined in consultation with Region 2. A breakpoint analysis of cost/benefit will be performed to identify an appropriate range of RALs. The FS will evaluate risk reduction and protectiveness for primary or representative risk drivers, consistent with the approach implemented in the lower 8-mile FFS/ROD.

2. Adaptive Management: The CPG agrees with the Region's comments that adaptive management can be applied to both the remedy design and implementation phases. As noted in the lower 8-mile ROD, the Region is willing to consider such items as alternative capping techniques that would make the remedy implementation more efficient. The CPG also presumes that the Region will review and evaluate data from the lower 8-mile Pre-design Investigation and other supplemental studies, consistent with the ROD language stating, "[Adaptive management] means testing of hypotheses and reevaluating site assumptions as new information is gathered."

   Details of an adaptive management approach (which were presented in Appendix E of the draft FS submitted to EPA on 4/30/15) are included with these responses to comments. Adaptive management will be a component of all alternatives for the upper 9 miles. Consistent with the EPA's comments, for the 17-mile FS, adaptive management refers holistically to the design, implementation, and performance of a remedy. This construction of the role of adaptive management in the 17-mile FS is consistent with EPA policy and guidance and precedent at similarly complex sediment sites.

3. Implementability Assumptions: The CPG has significant reservations regarding Region 2's assessment of the challenges and constraints of implementing remedial actions on the LPR. The Region has essentially dismissed many implementation obstacles that have been experienced within the LPR and at other sites. For example, the evaluation performed by Region 2 and presented in the lower 8-mile ROD Responsiveness Summary regarding the efficacy of hydraulic transport around bridges with very low clearance did not consider the multitude of engineering and implementation difficulties and, therefore, concluded that the effort would be relatively straightforward. However, significant and numerous implementation challenges exist for implementation of both the lower 8-mile remedy and the remedy for the upper nine miles, and these challenges will affect construction schedule. The 17-mile FS will adopt realistically conservative assumptions pertaining to construction means and methods and associated schedule implications, with the overarching goal of satisfying CERCLA requirement to maintain

consistency in FS assumptions across alternatives to facilitate a balanced comparison of alternatives.

4. FS Design: The set of FS design assumptions will be reviewed and refined as appropriate to support development, costing, and evaluation of remedial alternatives. Technologies will be retained where appropriate to permit maximum flexibility and inclusion of new technologies during remedial design. The FS will not specify exact technologies, construction means or methods; these will be developed during design process. This level of design detail is not necessary or typical for FS assumptions. All FS assumptions will be reasonably supported and consistent across alternatives to support a balanced and objective evaluation relative to the nine NCP criteria for remedy evaluation.

5. Lower 8-Mile Remedy Inclusion: All alternatives for the 17-mile FS will include the bank-to-bank remedy selected in the lower 8-mile ROD. As directed by the Region, a no-action alternative for the entire 17-mile study area will not be included in the revised set of alternatives presented in the revised 17-mile FS. The timing and schedule of the remedial actions in the upper and lower portions of the LPRSA will have a significant effect on the short- and long-term effectiveness evaluations and will play a large role in engineering assumptions and cost estimates. The CPG anticipates significant discussions with Region 2 regarding reasonable assumptions on the incorporation of the lower 8-mile remedy in the evaluation of alternatives for the full 17-mile LPRSA.

6. Federal Navigation Channel (FNC): The CPG assumes that Region 2 supports deauthorization of the FNC for the upper nine miles of the LPRSA, and that the Region will seek Congressional approval for deauthorization of this reach in conjunction with seeking deauthorization/reauthorization for the lower 8 miles. Within the 17-mile FS, discussion of the navigation channel and the need for deauthorization will be limited to the upper nine miles, to the extent that active remedial alternatives may fall within the FNC. This approach is consistent with the lower 8-mile ROD (p. 42):

   "USACE has advised that based on current information about reasonably anticipated future use of the channel, it will support a recommendation for Congressional action to deauthorize the federal navigation channel from RM 1.7 to RM 8.3."

7. No Further Action: A No Further Action alternative will be evaluated, which will incorporate the lower 8-mile remedy, the RM 10.9 removal action, and the Phase I removal action at the Lister Avenue facility, but no additional active remediation for the upper 9 miles of the LPRSA. The FS will assume monitoring associated with these actions. This approach is consistent with the NCP, which states:

   "The no-action alternative, which may be no further action if some removal or remedial action has already occurred at the site, shall be developed." NCP §300.430(e)(6)

8. Biologically Active Zone (BAZ): Remedial performance metrics for the sediment bed will be based on the 0 to 15 cm depth, consistent with the Region's directives from the June 2016 dispute resolution. The CPG continues to disagree with EPA's unilateral determination that the BAZ thickness is 15 cm. The CPG has previously provided to the Region a substantial amount of technical evidence that the BAZ is in fact much shallower, and the CPG continues to consider its interpretation the correct one. Although the CPG will use the 15 cm thickness as directed, we note that the EPA determination has not been peer reviewed pursuant to the AOC; as such, the CPG reserves all rights and defenses.

9. Evaluation Period: The evaluation of alternatives will extend 30 years following the completion of active remediation per the Region's request. Model projections will be modified accordingly (note that model run times on the order of several months will be required). Evaluation and comparison of alternatives will consider both the construction period and the 30-year period following completion of construction. Construction periods for all alternatives will be based on realistically conservative assumptions regarding dredge production rates and construction schedules. The CPG continues to believe that the timeframes used by EPA in the ROD for the lower 8-mile remedy are not realistic and do not incorporate an appropriate level of conservatism that is needed for the comparison of alternatives. The CPG expects to have further discussion of construction assumptions for the 17-mile FS with the Region.

10. Exposure Reduction Measures: The role of institutional controls, which may include enhanced advisories and public notifications, and/or carp reduction measures or fish exchange programs, in achieving additional exposure reduction will be discussed in the evaluation of remedial alternatives for the 17-mile FS. Additional protection that may be attained through implementation of institutional controls will be acknowledged but not quantified. Additionally, the sensitivity of future exposure estimates to the assumed fish diet composition will be described.

11. Residuals Release: The FS will develop a reasonable set of engineering assumptions regarding management of residual releases. During remedy implementation, residuals will be managed through a variety of means to achieve performance goals established during remedial design. A residuals release rate of 3% will be used in the modeling, consistent with the modeling performed to support the lower 8-mile ROD and FFS.

12. Principal Threat Waste (PTW): The FS will discuss the process to determine whether PTW is present in the upper 9 miles and how any PTW will be handled. The approach will be generally consistent with the Region's discussion presented in the lower 8-mile ROD.

EPA COMMENTS
DRAFT REMEDIAL ALTERNATIVES SCREENING TECHNICAL MEMORANDUM
LOWER PASSAIC RIVER STUDY AREA
DATED APRIL 15, 2015

No.	RAS General Comments	CPG Response 12/2/16
1	The Draft Remedial Alternatives Screening Technical Memorandum (memorandum) presents the development and preliminary screening of remedial alternatives for the Lower Passaic River Study Area (LPRSA). The memorandum needs to be revised based on EPA-accepted information, evaluations, concepts and conclusions of the remedial investigation (RI), baseline human health risk assessment (BHHRA) and baseline ecological risk assessment (BERA). The RI, BHHRA and BERA are currently being developed and this memorandum may require additional revisions after the three documents are accepted by EPA. In addition, the development of any remedial alternatives must reflect EPA's selected remedy in the Record of Decision (ROD) for the Lower 8.3 Miles of the Lower Passaic River (LPR). This comment set does not include further direction on the remedial action objectives (RAOs) language that was presented in this memorandum. EPA is having further deliberations internally on the RAOs and will provide direction to CPG on the matter at a later date.	See Introduction and General Response #5. Per the email from J. LaPoma to R. Law on 10/11/16, EPA stated that it will not provide further direction on the RAOs.
2	The memorandum fails to conduct a meaningful screening of remedial alternatives. Please revise the memorandum to provide greater detail regarding the development of alternatives, to recognize EPA's selected remedy for the lower 8.3 miles of the LPR, to develop a wider range of alternatives, and to screen and evaluate them consistent with EPA guidance. The memorandum should include additional alternatives that focus on contaminated sediments upstream of RM 8.3 that are based on a range of remedial action levels (RALs) for COCs identified based on	See General Responses #1 and #5. The revised memo will include a description of the development of an expanded set of alternatives that incorporate EPA's selected remedy for the lower 8.3 miles of the LPR. Where appropriate, the memo will acknowledge that additional supporting detail for the evaluation of alternatives will be provided in the RAE memo and appendices to the FS.

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No.	RAS General Comments	CPG Response 12/2/16
	the results of the baseline human health and ecological risk assessments (which will impact the remedial footprint), and provide a discussion of how these RALS were developed and selected. This will allow for the development of a series of targeted cleanup alternative similar to Alternative 4, provided that sufficient data density exists to properly evaluate such a targeted alternative. This will also allow the long- and short-term effectiveness, cost, and implementability of the alternatives to be properly evaluated in the detailed and comparative evaluation of alternatives in the feasibility study (FS) by better understanding the uncertainties and tradeoffs associated with either a targeted or comprehensive remedial strategy above RM 8.3. It is the purpose of the FS to evaluate the tradeoffs associated with either approach through the remedy selection factors.	
3	The memorandum makes frequent reference to an adaptive management approach. However, the details of such an approach are not described. Please revise the memorandum to describe the elements of an adaptive management strategy (e.g., interim targets, contingencies, monitoring, etc.) that is specific to each alternative. It should be noted that EPA's selected remedy for the lower 8.3 miles of the LPR as specified in the ROD contemplates an adaptive management approach during the design and implementation of the remedy. As a result, the memorandum should be revised to include adaptive management strategies for Alternatives 2, 3, and 4 (and any additional developed alternatives) as a component of monitored natural recovery (MNR), capping, and dredging activities.	See General Response #2. A discussion of adaptive management and the development and application of interim targets was included in Appendix E of the FS, submitted to EPA on 4/30/15, and will be included with the revised memo. Appendix E is attached to these RTCs.
4	The memorandum over-emphasizes the impacts of bridges and other infrastructure on implementation of the remedy. While it is appropriate to acknowledge these difficulties during the implementability evaluation, the memorandum should consider	See General Responses #3 and #4. The CPG disagrees with the EPA's contention that the LPR's bridges and other structures are not a significant factor in conducting any active remediation. Both TMO's Phase 1 and

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No.	RAS General Comments	CPG Response 12/2/16
	measures to mitigate these issues (e.g., the use of low profile barges that can pass beneath bridges and hydraulic transport of dredged materials via pipelines under bridges to lessen the number of required bridge openings.), as also discussed in the ROD for the Lower 8.3 Miles of the LPR. Also, the memorandum should include the need for coordination with bridge authorities and associated costs in the analysis. Please revise the memorandum to include discussions of these mitigation measures and associated costs.	CPG's RM 10.9 Removal Actions were impacted by the bridges. While costs of coordination with state and local authorities will be reflected in general manner in indirect cost estimate assumptions for the FS, costs of bridge repairs themselves are outside of CERCLA requirements and will not be included in the evaluation of alternatives.

No.	Page No.	RAS Specific Comments	CPG Response 12/2/16
5	Page 1-1, Section 1	All remedial alternatives (including the no action alternative) should assume dredging and capping of the lower 8.3 miles of the LPR consistent with EPA's selected remedy presented in the ROD for the Lower 8.3 Miles of the LPR.	See General Response #5.
6	Page 1-1, Section 1, second paragraph, last sentence	Paragraph two makes reference to the "site-specific" Baseline Human Health Risk Assessment. If this is referring to the separate risk assessment submitted by the CPG on Feb. 18, 2015 with the letter transmitting the draft RI Report to EPA, the risk assessment should not be used in support of the FS and alternative screening technical memo. As previously stated, this risk assessment was developed outside the RI/FS process using assumptions and methods that are unacceptable to EPA. As noted in EPA's comments on the draft RAO/PRG Technical Memorandum provided to the CPG on August 4, 2016 references to the "alternate" BHHRA should be deleted and the memorandum should be	The CPG stands behind its Site-Specific HHRA which presented a realistic and CERCLA-compliant assessment of human health risks within the entire 17-miles. This sentence refers to the documents developed and submitted as part of the RI/FS process, all of which were based on site-specific data and supporting evaluations. References specific to the site-specific, or "alternate" BHHRA will be deleted. Nevertheless, the memo will be revised consistent with the EPA-approved RI and Risk Assessments.

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No.	Page No.	RAS Specific Comments	CPG Response 12/2/16
		revised to be consistent with EPA comments on the RI, BHHRA, and BERA.	
7	Page 2-1, Section 2.1, bullets	As discussed in General Comment 1, EPA will provide direction to CPG on this section at a later date.	Per the email from J. LaPoma to R. Law on 10/11/16, EPA has no further direction on the RAOs.
8	Page 2-1, Section 2.2	The PRGs presented in this section were developed using unacceptable risk assessment assumptions and conclusions which will require significant modifications. The PRGs should be revised to be consistent with EPA comments on the BHHRA, BERA and RAO/PRG technical memorandum.	Revised PRGs will be developed in the RAO/PRG technical memorandum, consistent with the EPA-approved BHHRA and BERA and pending resolution of EPA comments on the RAO/PRG memo.
9	Page 2-2, Section 2.3, first paragraph, third through fifth sentences	The text states: "At many sites, attaining a final cleanup level will not be achieved solely by active remediation and will rely in whole or part on natural recovery processes continuing over time. There are also circumstances…" This is not relevant to the discussion of RALs. Please delete these sentences from the paragraph.	These statements were intended to describe the application of RALs, and the process by which PRGs can be met following active clean up, for remedies where RALs are not equal to PRGs. The sentences will be revised for clarification.
10	Page 2-2, Section 2.3	Although the concept and potential application of RALs for the LPR may be acceptable, the development of the RALs requires close coordination with the EPA to ensure use of appropriate methods relative to conditions within the LPR. The development of RALs must be consistent with an appropriate PRG, and the agreed upon COPC mapping procedures that appropriately consider uncertainty and sediment bed dynamics.	RALs will be developed in coordination with EPA and based on EPA-approved COPC mapping. The development of the RAL does not depend on the PRG; rather, the efficacy of a particular action level is evaluated relative to a PRG.

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No.	Page No.	RAS Specific Comments	CPG Response 12/2/16
11	Page 2-2, Section 2.4	This section references CPG's fate and transport modeling work, which has not been fully presented, reviewed or approved by EPA. This section also mentions that within this modeling, CPG has used two exposure zones, 0-2 cm and 0-15 cm. Consistent with the June 28, 2016 letter from Walter Mugdan, EPA Director, Emergency and Remedial Response Division to Dr. Robert Law, the top 15 cm of sediment must be used to represent contaminant concentrations applicable to the biological exposure depth.	See Introduction and General Response #8.
12	Page 3-1, Section 3, last bullet	Adaptive management represents a management framework and should not be considered a general response action (GRA). Please revise the text accordingly.	The text will be revised to clarify the role of adaptive management in the FS process.
13	Page 3-2, Section 3.1, second paragraph	Consistent with EPA guidance, the text should note that "cost plays a limited role in the screening of process options" (Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, EPA/540/G-89/004, October 1988). Please revise the text accordingly.	The text will be revised to reflect the referenced guidance, that "each process is evaluated as to whether costs are high, low, or medium relative to other process options in the same technology type."
14	Page 3-3, Section 3.1.1	The No Action alternative should not include five year reviews.	See General Response #7.
15	Page 3-5, Section 3.1.3	Please revise the text to consider monitoring as an ancillary activity, rather than as a process option. Monitoring does nothing to reduce risk; rather, it documents whether risk reduction is occurring and helps to inform if the remedy is functioning as intended.	Consistent with EPA guidance, monitoring has been included as a general response action in the screening evaluation. This is considered appropriate, given monitoring results may have significant implications to any future

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No.	Page No.	RAS Specific Comments	CPG Response 12/2/16
			modifications to the remedy that may be necessary to maintain compliance with the RAOs.
16	Page 3-6, Section 3.1.4.1, first paragraph, third sentence	The text states that "natural recovery may be inhibited by ongoing contaminant sources and is not applicable in areas subject to net erosion." It is more appropriate to state that MNR may not be effective in areas subject to erosion. In addition, MNR may not be effective in areas that, while stable and not defined as "net erosional," are subject to periodic erosion and deposition. Please revise the text accordingly.	It is agreed that natural recovery may not be effective in areas subject to net erosion, and the text will be revised. However, in areas that are not defined as "net erosional" or potentially subject to periodic erosion under extreme events, MNR may be effective with appropriately defined monitoring and associated response actions.
17	Page 3-10, Section 3.1.5.2, Thermal Desorption	The CPG removed thermal desorption from further consideration. However, given the successful use of thermal desorption for PAHs and other organic contaminants from hazardous waste sites (coal gas wastes in particular), retention of this technology should be re-considered. Although elevated levels of metals exist in sediment, the observed levels may not present conditions that would preclude use of thermal desorption along with other remedial technologies within a future sediment treatment train.	The text will be revised to retain thermal desorption as a remedial technology.
18	Page 3-11, Section 3.1.5.3	The boxed text regarding the conclusion that beneficial reuse may be an effective alternative to landfill disposals should also note the requirements of the state where the material is destined for beneficial use as one of the factors relevant to the feasibility of this approach.	The text will be revised.

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No.	Page No.	RAS Specific Comments	CPG Response 12/2/16
19	Page 3-12, Section 3.1.6, first bullet	Please revise the discussion of physical isolation to note that the goal of physical isolation is to prevent exposure by human and ecological receptors.	The text will be revised.
20	Page 3-15, Section 3.1.7	The ROD and responsiveness summary for the Lower 8.3 Miles of the LPR explain why it is necessary to either obtain de-authorization of the federal navigation channel and/or modification of the authorized depth, or to dredge to meet the authorized depth after capping. The second sentence should be deleted. Alternately, the text could note that the selected remedy for the sediment of the lower 8.3 miles includes deeper dredging in the lower 1.7 miles. The CPG's opinion that it is "not a requirement of the LPRSA AOC or under CERCLA" to consider the navigation channel should be omitted.	See General Responses #5 and #6. The text will be revised accordingly.
21	Page 3-18, Section 3.1.7.2	The statement that "locations within the LPRSA … would more easily comply with EPA's Off-Site Rule" is perplexing. How is the location of the processing facility related to the Off-Site Rule? The Off-Site Rule has to do with whether disposal facilities where material is sent for disposal are in compliance with RCRA or other applicable Federal or State regulations. The location of the processing facility within the LPRSA would mean that permits would not be required, but how would that change the application of the Off-Site rule?	EPA's Off-Site Rule (40 CFR § 300.440) applies to any remedial or removal action involving the off-site transfer of any hazardous substance, pollutant, or contaminant as defined under CERCLA sections 101 (14) and (33) ("CERCLA waste"). Given that sediment processing is a form of treatment, the Off-Site rule is applicable in the evaluation of permitting requirements.
22	Page 3-20, Section 3.1.7.3, second paragraph, third sentence	The text states: "A mass balance analysis using monitoring data from 11 environmental dredging projects estimated generated residuals from 2 to 9 percent of the mass of contaminant removed (Patmont and Palermo 2007; USACE	See General Response #11.

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No.	Page No.	RAS Specific Comments	CPG Response 12/2/16
		2008b)." Please revise this analysis to include residuals estimates from more recent dredging projects such as the recent Boeing Plant 2 dredging project on the Lower Duwamish Waterway in Seattle, WA. Recent improvements in engineering controls and best management practices (BMPs) have the potential to reduce the mass of generated residuals.	
23	Page 3-23, Section 3.1.9.1, continuing paragraph from previous page	Please revise the last sentence to state that the Tierra Phase 2 Removal is for 160,000 cubic yards (not 140,000).	The text will be revised.
24	Page 3-23, Section 3.1.9.1, second paragraph	With regard to the State of New Jersey's and the other Natural Resource Trustees' opposition to citing a CAD in Newark Bay for Passaic River sediments, the text states: "For the purpose of this evaluation, it assumed that these administrative feasibility challenges can be overcome through thoughtful consideration of the technical merits of this disposal option, in the context of the relative risks and impacts to the environment and the public posed by upland landfill disposal options." Please revise the second sentence to reference NJ Governor's November 28, 2012 letter to Lisa Jackson regarding the matter.	The text will be revised to reference the NJ Governor's letter.
25	Page 3-24, Section 3.1.9.3	In the description of landfill disposal of dredged sediment from the lower Passaic River for both the Tierra Phase I Removal Action and the RM 10.9 TCRA, the CPG omitted information on where prior dredged sediments were actually disposed. This section should be amended to	The text will be revised to include disposal locations for the prior removals, and to include the specified sentence.

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No.	Page No.	RAS Specific Comments	CPG Response 12/2/16
		indicate that these sediments were disposed at properly-licensed, hazardous waste facilities. Most dredged materials were taken to a selection of Subtitle C Hazardous Waste Landfills, however, a small portion of Phase I dredged material was taken for pre-treatment at a licensed hazardous waste incineration facility, prior to Subtitle C landfill placement. Insert a sentence prior to last sentence of the last paragraph that reads "Testing will be performed to properly characterize the sediment for disposal, and all applicable disposal requirements will be met."	
26	Page 3-26, Section 3.2	The last sentence refers to "adaptive management" as though it were a phase of the remedial action. Revise the last sentence to read "Emerging and innovative technologies not considered by the feasibility study may be evaluated during remedial design and remedial action under an adaptive management strategy."	The text will be revised to reflect future evaluation of emerging and innovative technologies.
27	Page 4-1, Section 4	The memorandum includes the following alternatives: • Alternative 1: No further action (river mile [RM] 0 to 17.4) • Alternative 2: Targeted dredge and cap, MNR, and adaptive management (RM 0 to 17.4) • Alternative 3: Dredge and cap for RM 0 to 8.3, including reestablishment of the navigation channel from RM 0 to 2.2 (EPA FFS Alternative 3), and MNR for RM 8.3 to 17.4 • Alternative 4: Dredge and cap for RM 0 to 8.3, including reestablishment of the navigation channel	See General Responses #1, #5, and #7. The CPG notes that pursuant to section §300.430(e)(6) of the NCP, it is correct to refer to Alternative 1 as no further action, given the performance of the RM 10.9 Removal Action. *"The no-action alternative, which may be no further action if some removal or remedial action has already occurred at the site, shall be developed."*

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		from RM 0 to 2.2, targeted upstream dredge and cap for RM 8.3 to 17.4, and MNR Alternative 1 should be "no action" – not "no further action" which implies some action is being taken. All remedial alternatives, including the No Action alternative should assume dredging and capping of the lower 8.3 miles of the LPR consistent with EPA's selected remedy. The other alternatives should only address remedial actions in RM8.3 to RM 17.4 and any additional remedial actions in RM 0 to RM 8.3 that are necessary to address surface water quality (if any). In addition, Alternatives 2 and 4 utilize an RAL of 500 nanograms per kilogram (ng/kg) 2,3,7,8-tetrachlorodibenzodioxin (TCDD). EPA recommends development and evaluation of additional alternatives that rely on a range of RALs for 2,3,7,8-TCDD and other COCs identified based on the results of the baseline human health and ecological risk assessments. A break point analysis should be performed that investigates the relationship between surface weighted average concentration (SWAC) and area remediated for 2,3,7,8-TCDD RALs ranging from 50 ng/kg to 1,000 ng/kg. The results of this analysis should be used to develop supplemental alternatives that target a range of 2,3,7,8-TCDD RALs under a targeted dredge and cap scenario, in conjunction with bank-to-bank remediation between RM 0 and RM 8.3. A similar analysis should be performed for other COCs.	
28	Page 4-2, Section 4.1.1	References to deepening or reestablishment of the FNC should be eliminated since dredging within the FNC is addressed through EPA's selected remedy for the Lower 8.3	See General Response #6.

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No.	Page No.	RAS Specific Comments	CPG Response 12/2/16
		Miles of the LPR. The discussion of dredge depths should focus on the targeted removal upstream of RM 8.3 and the dredging depth required to remove contamination, limit flooding if conducted in conjunction with capping and any allowable overdredging.	The specific dredge depths will be included in the description of the remedial alternatives.
29	Page 4-2, Section 4.1.1, first paragraph, third sentence	The text states: "The removal of this additional sediment is not necessary to achieve the RAOs, and there is no evidence of reasonably anticipated future uses that would require accommodation through deepening of the FNC." This statement of the CPG's opinion conflicts with EPA's analysis as documented in the FFS Report, the Proposed Plan, and ROD for the Lower 8.3 Miles of the LPR, and it is not relevant because dredging in the navigation channel is incorporated in the remedy between RM 0 and 1.7. The two sentences beginning with "The removal of this additional sediment…" should be removed. Further discussion of the navigation channel should reference, or be consistent with, the ROD for the Lower 8.3 Miles of the LPR.	See General Responses #5 and #6. The text will be revised accordingly.
30	Page 4-2, Section 4.1.1, third paragraph	The text notes that "a clean stable surface over the removal areas" will be in place at the end of construction and that this clean surface material would "range in thickness from approximately 6 inches to 3 ft." Please revise the text to discuss the difference between a 6-inch residual management layer and a 3-foot cap in this section.	The text will be revised to include a discussion the difference between a management layer and a cap.
31	Page 4-3, Section 4.1.2.2	Please revise the text to incorporate a treatment option into Dredge Material Management (DMM) Scenario A – Off-Site Disposal for management of dredged materials that may require treatment due to land disposal restrictions (LDRs) or other regulatory disposal requirements or to facilitate	A treatment option will be incorporated in DMM Scenario A to address sediments that may be subject to disposal restrictions or to facilitate beneficial use.

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No.	Page No.	RAS Specific Comments	CPG Response 12/2/16
		beneficial use of contaminated sediments subsequent to treatment.	
32	Page 4-4, Section 4.1.3	Please revise the text to include analyses to determine whether reactive amendments should be included in the cap design. In addition, the memorandum should investigate whether armoring is required in potential high-scour areas.	A Cap Design Evaluation was submitted as Appendix G of the Draft FS to EPA on 4/30/15 and will be included with the revised memo. Appendix G is attached to this RTC. The final cap design, including the need for and locations of amendments and armoring, will be performed as part of the remedial design.
33	Page 4-4, Section 4.1.4	Ongoing contaminant sources include both internal sources (e.g., areas of sediment contamination subject to erosion and transport) and external sources (e.g., sediment entering the LPR from above Dundee Dam, and from Newark Bay). Please revise this section to discuss these classes of sources.	Ongoing contaminant sources are discussed in the RI, and the corresponding section will be referenced here.
34	Page 4-5, Section 4.1.5, first paragraph, second sentence	The text in line three that refers to baseline monitoring should be changed from post-remediation to pre-remediation.	The text will be revised.
35	Page 4-5, Section 4.1.6	In light of EPA's selected remedy for the lower 8.3 miles of the LPR, the discussion of adaptive management should focus on areas upstream of RM 8.3 where either MNR or targeted remediation is planned. Please revise the text accordingly. Furthermore, please revise the third paragraph to allow for adaptive management to be a component of all remedial alternatives. Contrary to CPG's assertion, adaptive management practices could be implemented for all active	See General Response #2. The text will be revised.

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		remedial alternatives and are explicitly included in the lower 8.3 mile remedy. Adaptive management methods, which are wide-ranging, can always be considered and used to enhance attaining remedial goals sooner, more safely, and/or with lower costs, depending on the circumstances.	
36	Page 4-7, Section 4.1.8	CPG should address whether impacts to aquatic habitat will require compensation beyond restoration, e.g., for the temporal loss of natural resources.	Remedial activities will be designed to avoid net loss of habitat. Consideration of compensatory restoration is beyond the scope of the FS.
37	Page 4-7, Section 4.1.9	Please provide citation for the projections of sea level rise by researchers at Rutgers University. Missing from the description of potential sea level rise in the Passaic River is the additional, inseparable component of expected higher frequency of extreme storm and flooding events. Both sea level rise and extreme storm and flooding events will need to be considered during remedial design. This section should be amended accordingly.	Citation will be provided. The text will be revised.
38	Page 4-7, Section 4.1.10	The Lower 8.3 Miles Responsiveness Summary discusses how EPA identified the depths included in the ROD. Please revise this discussion, removing the CPG's critique of the 2010 survey and its conclusion that EPA has not provided sufficient basis for the additional dredging in the navigation channel. Deauthorization and/or modification of the federal navigational depths in the Lower 8.3 Miles will be addressed during the remedial design phase for OU2. Please delete Paragraph 3 of Section 4.1.10 ("The USACE has not performed…") because it is incorrect. This has previously been addressed by EPA in the responsiveness summary of	See General Response #6. The CPG disagrees that adequate justification for the reconstruction of the FNC has been provided. However, it is not relevant to the evaluation of remedies in the upper 9 miles. This section will be revised to focus on the impact of the presence of the FNC on the set of alternatives to be evaluated.

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		the lower 8.3 mile ROD. For the same reason, the last sentence of paragraph 5 should be deleted ("However, as detailed above…" Additionally, the 6th paragraph should be deleted as it is unnecessary, since the lower 8.3 mile ROD will be included as the No Action alternative.	
39	Pages 4-9 through 4-10, Section 4.1.11.1	The text describes in length the effects of bridges on remedial measures. EPA acknowledges the challenges associated with bridges within the LPRSA. Please revise the text to discuss management approaches such as the use of low profile barges that can pass beneath bridges and hydraulic transport of dredged materials via pipelines under bridges to lessen the number of required bridge openings that can minimize the effect of bridges and bridge openings on the transport of dredged material and dredging equipment rather than only indicating that remedial activities will be impacted. The memorandum should consider these measures to mitigate the issues as also discussed in the ROD for the Lower 8.3 Miles of the LPR.	See General Responses #3 and #4.
40	Page 4-12, Section 4.1.11.3	Many of the constraints described in Section 4.1.11 can be minimized during remedial design through appropriate selection of equipment, development of multiple processing stations, active management of the transport and staging of equipment and dredged material, and development of specifications regarding the timing of dredging and transport activities. Please revise the text accordingly. Note, construction constraints are typically not considered a "long-term stress" in the nine criteria analysis. These are better described as short term impacts.	See General Responses #3 and #4. The EPA has yet to demonstrate the ability to mitigate many of the constraints that are present in the LPR. Nevertheless, the text will be revised to clarify further that opportunities exist to mitigate the impact of some of the construction constraints using the approaches enumerated in this

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		Third and fourth bullets include broad statements referring to frequent bridge openings and "economic, social and environmental impacts" that are not well supported.	comment; these approaches will be evaluated further during remedial design. In the nine criteria analysis, the evaluation of construction impacts will be presented in the evaluation of short-term impacts. For clarity, the phrase "long-term stress" will be modified to read "stress". Additional evaluation of short-term impacts of large-scale remedy construction on the environment and surrounding communities was presented in Appendix I of the Draft FS submitted to Region 2 on 4/30/2015 and will be referenced in this section. Appendix I is attached to this RTC.
41	Pages 4-13 through 4-21, Section 4.2	Please revise the text to provide additional detail regarding the development of the proposed remedial alternatives. In addition, please develop a larger suite of alternatives followed by screening consistent with EPA guidance. All alternatives (including the no action alternative) should assume that capping and dredging will take place within the lower 8.3 miles of the LPR consistent with EPA's selected remedy for this portion of the LPR. Alternatives for the upper portion of the LPR should be developed by considering a range of RALs that achieve a range of SWACs, including at least one alternative that will achieve a protective SWAC or background concentrations immediately following construction. Furthermore, site-specific data should be evaluated to identify the preferred remedial technology/process option in various portions of the river considering contaminant characteristics, sediment characteristics, land and waterway use characteristics,	See General Responses #1, #5, and #7. The development of alternatives will consider site-specific data and information in the identification of preferred remedial technologies and process options for various locations in the river, in the development and application of a range of RALs, and in the preliminary identification of potential staging, processing, and treatment areas.

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		physical characteristics and other relevant information. Please revise the discussion of RALs, the associated target areas for given RAL and the resulting reduction in SWAC to reflect the updates to the CPG's mapping approach once it receives approval from EPA. Alternative 1 should be "No Action" not "no further action", or no further remedial action, though it is appropriate to acknowledge the remedy for the Lower 8.3 Miles. "No Action" typically should not include five year reviews – however, the text can acknowledge that five year reviews will be conducted for the Lower 8.3 Miles, as that is part of the selected remedy.	
42	Pages 4-13 through 4-18, Section 4.2.2	Please revise the text to provide greater justification for the selection of a 500 ng/kg RAL for 2,3,7,8-TCDD and describe the resulting sediment concentrations on a SWAC basis over a range of exposure areas (e.g., site-wide and over 1 RM). A similar analysis should be conducted for other COCs identified based on the results of the baseline human health and ecological risk assessments. The text should provide analysis for the selection of a range of RALs (e.g., SWAC vs. area curves with a range of RALs depicted on the curve). Ultimately, the text should be revised to consider a range of RALs for targeted remediation.	See General Response #1.
43	Page 4-14, Section 4.2.2, first full paragraph	Alternative 2 calls for targeted dredge and cap. However, no basis for the targeted dredge depth of 3 feet is provided. If this depth is to accommodate a 3-foot cap, that should be stated in the text. In addition, dredging and capping between RM 0 and RM 8.3 will be addressed as part of OU2, so the targeted dredge and cap option should focus on the	The text will be revised to provide support for the dredge depths for the alternatives above RM 8.3.

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		portion of the LPR upstream of RM 8.3. Please revise the text to discuss the dredge depths in different areas of the upper portion of the LPR based on consideration of water depth and other factors (e.g., scour potential).	
44	Page 4-14, Section 4.2.2, second full paragraph, first sentence	Dredging and capping between RM 0 and RM 8.3 will be addressed as part of OU2. Above RM 8.3, some dredging and capping is likely implementable near some structures. Please revise the text to include an allowance for dredging and capping in these areas using specialized equipment and consideration of the removal of certain structures to facilitate the application of capping and dredging technologies. The added costs associated with capping and dredging in the vicinity of structures should be included in the cost estimate.	See General Response #4. The FS will allow sufficient flexibility to select appropriate equipment to perform dredging near structures. The selection of specific equipment will be part of the remedial design and/or the implementation process. For the purposes of the FS, conservative assumptions will be made regarding existing structures and associated engineering constraints and costs. Appropriate consideration of structural impacts (e.g., dredge offsets or removal) will be made during remedial design.
45	Pages 4-15 through 4-16, Section 4.2.2.1	For human health, only risks due to direct contact are discussed here. Please revise this section to discuss the risks associated with fish and shellfish consumption as well. In addition, the development of RALs must be consistent with the results of the RI (including delineation of contamination and contaminant fate and transport modeling), BHHRA and BERA and, as a result, may require revision based on the resolution of EPA comments on these documents.	The discussion of the development of RALs will be revised to include a range of RALs (See General Response #1) and the discussion of the benefits of the RALs will be revised accordingly. The discussion referenced in this comment was focused on benefits immediately following construction (e.g., achievement of the direct contact PRG). Longer-term benefits (based on the model projections) such as reduction in fish and crab consumption risk are mentioned in the last paragraph on Page 4-16, and discussed in the evaluation of alternatives. This distinction of

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			post-construction and longer-term risk reduction will be retained.
46	Page 4-16, Section 4.2.2.1, last bullet	Please revise the text to provide information regarding incoming particle concentrations at Dundee Dam for other COCs, in addition to 2,3,7,8-TCDD and total polychlorinated biphenyls (PCBs). This information can be used to evaluate recontamination potential and background concentrations.	The text will be revised to include COC concentrations of sediments entering the LPR over Dundee Dam.
47	Page 4-17, Section 4.2.2.3	This section should be revised to remove references to the CPG's Fish Exchange Program. EPA offered in 2014 to discuss and/or evaluate the CPG's carp management/fish exchange program, but the CPG declined to submit its program for EPA review. Also, any remaining language that references carp as being invasive species should be revised. Carp should be referred to as non-native species.	See General Response #10. The CPG does not agree with the Region's characterization and chronology associated with the fish exchange or carp management programs. Federal and state agencies including the USFWS and more recently NJDEP have identified the common carp as an invasive species. It remains unclear to the CPG why the Region denies that common carp are an invasive species.
48	Page 4-19 to 4-20, Section 4.2.3.0	The discussion of the work below RM 8.3 is largely unnecessary as this will be addressed as part of OU2. Last sentence of this section incorrectly refers to the need to modify and/or deauthorize portions of the federal navigation channel as an institutional control. It is a legal prerequisite for a capping remedy, not an IC.	See General Response #6. Text will be revised to reflect that deauthorization of the FNC is a legal prerequisite for capping and not an IC.
49	Page 4-21, Section 4.2.3.1, second paragraph	Please provide information regarding the number of dredge plants, production rates, etc. that can be used to determine dredging durations in order to evaluate the durations presented in this memorandum.	Information supporting the dredging durations was provided in Appendix H of the Draft FS, submitted to EPA on 4/30/15, and will be

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No.	Page No.	RAS Specific Comments	CPG Response 12/2/16
			included with the revised memo. Appendix H is attached to the RTC.
50	Page 4-21, Section 4.2.4.1, first paragraph, second sentence	Both Alternatives 3 and 4 state 2.6 million cy of fill and capping material. Please correct one or both of the volumes stated.	Volumes will be updated.
51	Page 5-1, Section 5	The entirety of Section 5, which presents the preliminary screening of remedial alternatives, must be revised to reflect changes in the remedial action alternatives. Remedial action alternatives should focus on a range of RALs and remedial technologies targeting contaminated sediments within the LPR upstream of RM 8.3. All alternatives (including the no action alternative) should assume that capping and dredging will take place within the lower 8.3 miles of the LPR consistent with EPA's selected remedy for this reach of the LPR. In addition, the alternatives should be revised to address EPA comments on the screening technical memorandum and revisions to the RI, BHHRA and BERA resulting from EPA comments on these documents.	See Introduction and General Responses #1 and #5.
52	Section 5.1 and Section 5.1.1	Alternative 1 should be "No Action" not "no further action", or no further remedial action, though it is appropriate to acknowledge the remedy for the Lower 8.3 Miles. "No Action" typically does not include five year reviews – however, the text can acknowledge that five year reviews will be conducted for the Lower 8.3 Miles, as that is part of the selected remedy.	See General Response #7.

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No.	Page No.	RAS Specific Comments	CPG Response 12/2/16
53	Page 5-1, Section 5.1.1, first paragraph, first sentence	Please provide further discussion of the mechanism for declines in fish and crab tissue concentrations given the statement about little change in the SWAC.	Effectiveness evaluation and discussion will be revised following development of the set of remedial alternatives and the approval of the CFT model.
54	Page 5-1, Section 5.1.1, footnote 7	EPA anticipates that revisions to the CPG's model projections resulting from EPA's review of the CPG's mapping approach, contaminant fate, and bioaccumulation models as presented in the RI may be potentially significant. This document should be revised once EPA has approved the necessary changes to the models and reviewed both the calibration and projection model code, inputs, and results. To date the CPG has not provided the 2014 version of their model projection code, inputs, or results for EPA's review.	See Introduction.
55	Page 5-2, Section 5.1.3	Revise to reflect that there is no cost associated with the No Action alternative.	The text will be revised.
56	Page 5-5, Section 5.3.1, Second Paragraph	Projection runs should extend 30 years past the completion of each remedy, the impact of each remedy on fluxes should also be evaluated over this same period.	See General Response #9.
57	Page 5-4, Section 5.3.1, Page 5-6 Section 5.4.1	Please provide further details about the analysis that was done to determine that COCs other than 2,3,7,8-TCDD and Tetra-PCB would decline and approach regional background levels.	Effectiveness evaluation and discussion will be revised following development of the set of remedial alternatives and the approval of the CFT model, which will include projections for other COCs in addition to 2,3,7,8-TCDD.
58	Page 6-1, Section 6, second paragraph, last two sentences	The summary states: “A thorough consideration of the primary balancing criteria involves evaluation of cost-effectiveness in the context of differences in the manner and degree to which the alternatives address the remaining	Noted. Costs of long-term monitoring and maintenance will be included in the FS cost estimates.

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		primary balancing criteria. Alternatives that involve "[c]osts that are grossly excessive" compared to their overall effectiveness in comparison to other alternatives may be eliminated from further consideration, as may those that provide "effectiveness and implementability similar to that of another alternative by employing a similar method of treatment or engineering controls, but at greater cost" (40 CFR 430(e)(7)(iii); USEPA 1996)." The overall idea conveyed seems to be preference for less costly alternatives that are judged to similarly achieve the project's remedial action objectives. However, long-term, post remedial monitoring and maintenance costs must be considered for alternatives that leave material in place that must be managed in place over time. Since surface and near surface contaminated sediments are the primary source of unacceptable chemical risks/hazards to human and ecological receptors, use of in-place control measures, particularly for uncapped areas where sediment contamination remains in place, will require development of comprehensive cost estimates for long term (in perpetuity) monitoring and maintenance.	

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EPA PRELIMINARY COMMENTS
DRAFT REMEDIAL ALTERNATIVES EVALUATION (RAE) TECHNICAL MEMORANDUM
LOWER PASSAIC RIVER STUDY AREA
DATED APRIL 24, 2015

No.	RAE General Comments	CPG Response 12/2/16
1	The Draft Remedial Alternatives Evaluation Technical Memorandum (memorandum) presents the evaluation of remedial alternatives for the Lower Passaic River Study Area (LPRSA). The memorandum needs to be revised based on EPA-accepted information, evaluations, concepts and conclusions of the remedial investigation (RI), baseline human health risk assessment (BHHRA) and baseline ecological risk assessment (BERA). The RI, BHHRA and BERA are currently being developed and this memorandum may require additional revisions after the three documents are accepted by EPA. In addition, the evaluation of any remedial alternatives must reflect EPA's selected remedy in the Record of Decision (ROD) for the Lower 8.3 Miles of the Lower Passaic River (LPR). This comment set does not include further direction on the remedial action objectives (RAOs) language that was presented in this memorandum. EPA is having further deliberations internally on the RAOs and will provide direction to CPG on the matter at a later date. Sections 2.2 through 2.5 and all of Chapter 3 were not reviewed in detail because they present the evaluation of remedial alternatives that need to be revised. Any comments on specific alternatives should be incorporated into a revised evaluation of alternatives.	See Introduction and General Response #5. Per the email from J. LaPoma to R. Law on 10/11/16, EPA has no further direction on the RAOs.
2	The memorandum inconsistently and inappropriately considers the effect of institutional controls. For example, estimates of fish tissue concentrations are included in the evaluations based on assumptions regarding the effectiveness of institutional controls. The effect of institutional controls on risk reduction should be described qualitatively	See General Response #10.

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No.	RAE General Comments	CPG Response 12/2/16
	and the limitations on the effectiveness of such institutional controls should be discussed. Please revise the memorandum to eliminate the quantitative reduction in fish tissue levels associated with such institutional controls.	
3	The memorandum evaluates a limited number of alternatives. The memo should be revised to include the evaluation of a range of alternatives that address sediment contamination above RM 8.3. Alternatives should consider a range of remedial technologies and remedial action levels (RALs) for COCs identified based on the results of the baseline human health and ecological risk assessments (which will impact the remedial footprint), and provide a discussion of how these RALS were developed and selected. This will allow for the development of a series of targeted cleanup alternative similar to Alternative 4, provided that sufficient data density exists to properly evaluate such a targeted alternative. This will also allow the long- and short-term effectiveness, cost, and implementability of the alternatives to be properly evaluated in the detailed and comparative evaluation of alternatives in the feasibility study (FS) by better understanding the uncertainties and tradeoffs associated with either a targeted or comprehensive remedial strategy above RM 8.3. It is the purpose of the FS) to evaluate the tradeoffs associated with either approach through the remedy selection factors.	See General Response #1.
4	Please revise the analyses to clearly state the assumptions used to estimate the remediation timeframes, and ensure that these estimates reflect multiple dredge and/or capping plants operating simultaneously. The text should also be revised to discuss how the estimated 12-week dredging shutdown period was determined, accounting for weather and/or operational delays. The focused feasibility study (FFS) for the lower 8.3 miles assumed dredging to occur for 24 hours a day, 6 days a week, for 32 weeks of the year.	See General Responses #3 and #4. Detailed assumptions for dredge plant operations, production rates, and dredging season were presented in Appendix H of the Draft FS, submitted to EPA on 4/30/15, and will be included with the revised memo.

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No.	RAE General Comments	CPG Response 12/2/16
5	The memorandum makes frequent reference to an adaptive management approach. However, the details of such an approach are not described. Please revise the memorandum to describe the elements of an adaptive management strategy (e.g., interim targets, contingencies, monitoring, etc.) that is specific to each alternative. It should be noted that EPA's selected remedy for the lower 8.3 miles of the LPR as specified in the ROD contemplates an adaptive management approach during the design and implementation of the remedy. As a result, the memorandum should be revised to include adaptive management strategies for Alternatives 2, 3, and 4 (and any additional developed Alternatives) as a component of monitored natural recovery (MNR), capping, and dredging activities.	See General Response #2. A discussion of adaptive management and the development and application of interim targets was provided in Appendix E of the Draft FS, submitted to EPA on 4/30/15, and will be included with the revised memo. Appendix E is attached to this RTC.
6	The memorandum over-emphasizes the impacts of bridges and other infrastructure on implementation of the remedy. While it is appropriate to acknowledge these difficulties during the implementability evaluation, the memorandum should consider measures to mitigate these issues (e.g., the use of low profile barges exist that can pass beneath bridges and hydraulic transport of dredged materials via pipelines under bridges to lessen the number of required bridge openings), as also discussed in the ROD for the Lower 8.3 Miles of the LPR. Also, the memorandum should include the need for coordination with bridge authorities in the analysis. Please revise the memorandum to include discussions of these mitigation measures and associated costs.	See General Responses #3 and #4. While costs of coordination with state and local authorities will be reflected in general manner in indirect cost estimate assumptions for the FS, costs associated with bridge repairs are outside of CERCLA requirements and will not be included in the evaluation of alternatives.
7	The approach used to represent remediation in the CPG's models does not include the release of either solids or organic carbon. Instead, model results from the calibration period were recycled (Draft FS Section 5.2.1). This approach results in a significant overestimate of the impact of residuals proportional to the volume of sediments dredged. As an example, assuming about 40 mg/L of solids in the water column with a concentration of 100 ppt of 2,3,7,8-TCDD, if one adds another 20 mg/L of dredged solids with 800 ppt of 2,3,7,8-TCDD, the resulting concentrations	The model will be revised consistent with ongoing discussions between the CPG and EPA. The final set of FS projection runs will be performed with the EPA-approved version of the CFT model.

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	would be 60 mg/L of solids with a 2,3,7,8-TCDD concentration of 333 ppt, but one simply adds the contaminant mass without the solids, the result is 40 mg/L of solids with a 2,3,7,8-TCDD concentration of 500 ppt. The release of solids and organic carbon, and the changes in bathymetry and bed composition associated with remediation must be represented in the model projections in order to make a valid comparison between alternatives. These corrections should be made and the comparisons should be revised accordingly.	

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8	Page 1-1, Section 1, third paragraph	Please revise the text to describe the ROD and selected remedy for the lower 8.3 miles.	The text will be updated to reflect issuance of the ROD for the lower 8.3 miles.
9	Page 1-2, Section 1, second paragraph, second sentence	Text states: "A key finding of the remedial investigation is that contamination in the sediment, water column, and biological tissue data follows predictable spatial and temporal patterns that reflect the evolution of the river's sediment deposits, the nature of the sediments, *well-understood* erosion and deposition and contaminant fate and transport processes, and interactions between the sediment and biota. " (Emphasis added.) Remove the term "well understood". It's agreed that contaminant patterns have emerged as the RI progressed, particularly above RM 8.3. However, river conditions are highly variable and although some patterns exist, these patterns may not be reliably	The CPG disagrees that the patterns are not well understood, based on physical and chemical data collected during the RI, bathymetric surveys, modeling, geomorphological analysis, and consideration of fluvial/estuarine processes. If it is EPA's position that patterns of erosion and deposition are not well-understood throughout the river, then it follows that EPA's selection of a remedy for the lower 8-miles maybe premature and that the effects of erosion, deposition and transport from the upper 9-miles, above Dundee Dam and other areas may impact the lower 8-mile remedy in ways not understood by the EPA. An expanded discussion of erosion, deposition, sediment stability, and contaminant fate and transport will be presented in the RI and referenced in the FS.

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		repeated to the same degree elsewhere in the river, i.e., therefore not "well understood".	
10	Page 1-2, Section 1, second paragraph, second sentence	Text states: "To reduce contaminant levels in fish and crab tissue, remediation should focus on reducing contaminant levels in *contributing* sediments. These are the sediments that are not recovering, have relatively high contaminant concentration in the top few centimeters, and are inhibiting the overall recovery." (Emphasis added.) Remove the word "contributing" and the sentence that follows, beginning with "These are the sediments…". As currently presented, the characterization and scope of project sediments to be addressed by remedial actions is too limited. Current site conditions reveal contaminant levels in surface sediments that are several orders of magnitude greater than levels that are risk-based, and considered acceptable for human and ecological receptors. Therefore, it is expected that remedial actions will need to address a larger footprint, than currently conveyed, of sediments considered as "contributing" to unacceptable site risks. Contaminant levels in sediment must be reduced to levels protective of human health and ecological receptors, based on the findings of an Agency-approved project risk assessment and the resulting, derived, PRGs.	The word "contributing" will be deleted. The following sentence will be revised per RAE Specific Comment #11.
11	Page 1-2, Section 1, first full paragraph,	The memorandum states that remediation should focus on reducing contaminant levels in sediments that have relatively high contaminant concentrations in the "top few centimeters." The relevant sentence should be	The relevant sentence addressed in the comment will be revised. The following sentence will be clarified to state that the remediation of sediments driving risk will result in an immediate reduction to exposure and risk, which will continue to decline over time, but that

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	second to last sentence	revised to read: "These are the sediments that are not recovering, have relatively high contaminant concentrations, and are inhibiting the overall recovery." In addition, the word "immediately" should be removed from the following sentence because risks to human health will be reduced gradually over time following remediation due to the disruption of the sediment bed associated with implementation of the remedy.	risk reductions during active construction may be limited by disruption of the sediment bed during remedy implementation.
12	Page 1-2, Section 1, last paragraph	The discussion of phased remediation does not address the impact on cost, schedule, the community, etc., if the initial phase is found not to be protective, leading to additional phases, with additional costs and impacts from repeated mobilizations over time. Please revise the text accordingly.	The text will be revised.
13	Page 1-2, Section 1, last paragraph	All remedial projects, especially the larger, more complex ones such as the LPRSA, are amenable to enhanced implementation through use of adaptive management. EPA's selected remedy for the lower 8.3 miles of the LPR as specified in the ROD contemplates an adaptive management approach during the design and implementation of the remedy. As a result, the memorandum should be revised to include the elements of an adaptive management strategy (e.g., interim targets, contingencies, monitoring, etc.) that is specific to each alternative.	See General Response #2.
14	Page 1-3, Section 1, first	Remove the full sentence beginning with "Targeted remediation….".	The text will be revised to state, "A targeted remedy affords more opportunities for a phased remediation approach than a bank-to-bank remedy."

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No.	Page No.	RAE Specific Comments	CPG Response 12/2/16
	paragraph, last sentence		
15	Page 1-2, Section 1, last paragraph, second sentence	The text states: "The largest remedial alternatives considered in this evaluation will require decades to construct and a massive commitment of resources to implement." Please revise the text to temper this statement. There are means available to limit the duration and impact of the remedy (e.g., water quality controls, additional dredge plants to shorten the duration, proper staging of the remedial work), which should be included in the revised remedial alternative evaluations. Please review the entire document to ensure that all such statements are revised and clarified.	This text will be revised to state, "Together with EPA's selected remedy for the lower 8.3 miles, remedial actions for the upper 9 miles will involve significant timeframes for design and construction and a large commitment of resources to implement. While reasonably conservative assumptions regarding remedy construction and implementation impacts on the community and environment are adopted in this feasibility study, it is also recognized that means to limit the duration and impact of the remedies may be identified and will be fully evaluated during remedial design."
16	Page 1-3, Section 1.1, entire section	Remedial alternatives (current list and additional alternatives) to be presented in Section 1.1 must be consistent with EPA's selected remedy for the Lower 8.3 Miles of the LPR. The scope and description of each alternative must focus on contaminated sediment in the area between RM 8.3 to Dundee Dam. Each alternative should focus on achieving sediment remedial goals, enhance achieving river-wide surface water and biota remedial goals, and to complement the existing remedial action to be implemented per the ROD for the Lower 8.3 Miles of the LPR. Per this section, two Dredged Material Management (DMM) options are used: dewatering and transport/disposal in Subtitle C Landfill and a Confined Aquatic Disposal (CAD) facility to be built in Newark Bay. Although CADs in Newark Bay have been used for	See General Responses #1 and #5. The opposition expressed by the state of New Jersey will be discussed and considered in the discussion and evaluation of a CAD facility.

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No.	Page No.	RAE Specific Comments	CPG Response 12/2/16
		sediments obtained from other dredging projects in the region, due to the type of and degree of contamination in LPR sediments, potential for opposition should be considered during the evaluation of administrative implementability and state and community acceptance.	
17	Page 2-2, Section 2.1.1.1, bullets	As discussed in General Comment 1, EPA will provide direction to CPG on this section at a later date.	Per the email from J. LaPoma to R. Law on 10/11/16, EPA has no further direction on the RAOs.
18	Pages 2-1 through 2-47, Section 2	The evaluation of protection of human health and the environment and evaluation of residual risks are referenced to "the start of remediation." These should be evaluated after the completion of remediation. Evaluations from "the start of remediation" lead to invalid estimates that the surficial sediment 2,3,7,8-tetrachlorodibenzodioxin (TCDD) concentrations for Alternative 3 are higher than Alternative 2 since the construction period is longer. The real purpose of the evaluation of protection of human health and the environment should be for the long term, 30 years after completion of remediation and into the future. Please revise the text accordingly	See General Response #9. The text will be revised.
19	Page 2-1, Section 2.1.1.1	Consistent with EPA guidance, the "Overall Protection of Human Health and the Environment" criterion **does not** take short-term risk into account: "Evaluation of the overall protectiveness of an alternative during the RI/FS should focus on whether a specific alternative achieves adequate protection and should describe how site risks posed through each pathway being addressed by the FS	The CPG seeks clarification of this comment and refers the EPA to the boldface text in its comment. The guidance states explicitly that any unacceptable short-term or cross-media impacts may be taken into account in the evaluation of overall protectiveness of human health and the environment.

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		are eliminated, reduced, or controlled through treatment, engineering, or institutional controls. **This evaluation also allows for consideration of whether an alternative poses any unacceptable short-term or cross-media impacts"** (Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, EPA/540/G-89/004, October 1988). The text does not specify whether there are unacceptable short-term or cross-media impacts. The impacts during construction and implementation should be evaluated under "Short-Term Effectiveness" (Section 2.1.2.3). Please revise the text accordingly.	
20	Page 2-2, Section 2.1.1.1, Performance Metrics	Please revise the text to evaluate the proposed metrics both at T = 0 (immediately following construction) and at T = 30 years. This will help to demonstrate the tradeoffs between active remediation and natural recovery.	See General Response #9. The text will be revised.
21	Page 2-3, Section 2.1.1.1, PRGs	PRGs are not selected for tissue because tissue is not remediated. Please remove references to site-specific PRGs (SSPRGs) based on "realistic human health exposure assumptions and scenarios developed using site-specific information." This appears to be a reference to risk assessment that CPG conducted on its own which utilized their own assumptions about fish consumption, cooking loss, etc. The CPG cannot rely on SSPRGs developed through that process, based on a document that EPA did not approve and which utilizes exposure factors that they were directed by EPA not to use.	As stated in the CPG response to comments on the RAO/PRG Technical memorandum, the CPG disagrees with the Region's contention that sediment and surface water PRGs are more appropriate than tissue-based PRGs for fish consumption risks. Tissue exposure is the exposure pathway of concern and tissue concentrations reflect integrated uptake into the food web from sediment and surface water. For that reason, unique PRGs for sediment and surface water cannot be reliably established. Region 2's assertion that a tissue-based RBTC cannot be a PRG is surprising and inconsistent with precedents established at other Region 2 large sediment sites. Tissue-based PRGs have been established in Region 2 RODs addressing contaminated sediments for the Hudson River and Grasse River.

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		Please remove any references to SSPRGs that appear in the detailed and comparative evaluation of alternatives presented in this memo.	Reference to the SSPRGs will be removed although the CPG stands behind its Site-Specific HHRA which presented a realistic and CERCLA-compliant assessment of human health risks and the estimated SSPRGs.
22	Page 2-3, Section 2.1.1.1, Interim Targets	Please revise the text to include further discussion of the use of interim targets in the evaluation of overall protectiveness. For example, how do interim targets fit into an adaptive management strategy? Would additional actions be taken if the interim targets are not met? What is the time frame for achieving the interim targets?	A discussion of the development and application of interim targets was included in Appendix E of the Draft FS, submitted to EPA on 4/30/15, and will be included with the revised memo. Appendix E is attached to the RTC.
23	Pages 2-4 through 2-5, Section 2.1.1.1, Protection of Human Health	Add an evaluation of cancer and noncancer risk for all COCs which are determined by the baseline risk assessment. For polychlorinated biphenyls (PCBs), noncancer risks often drive cleanups because they result in a lower PRG than the 1×10^{-4} cancer risk level.	The discussion will be expanded to include an evaluation of cancer risks and noncancer hazards for fish and shellfish consumption for human health risk drivers evaluated in the CFT and food web models.
24	Page 2-5, Section 2.1.1.1, Protection of the Environment	The second bullet refers to the use of 0-2 cm depth interval to evaluate risk to sandpiper. Consistent with the June 28, 2016 letter from Walter Mugdan, EPA Director, Emergency and Remedial Response Division to Dr. Robert Law, the top 15 cm of sediment must be used to represent contaminant concentrations applicable to the biological exposure depth.	See General Response #8.
25	Page 2-6, Section 2.1.1.2,	It is premature to discuss the need for an ARAR waiver for the New Jersey SWQS based on technical impracticability. A detailed technical evaluation is	Please see the CPG's September 6, 2016 responses to Region 2's comments on the RAO/PRG technical memorandum on the issue of an ARAR waiver for the New Jersey SWQS. The water column data

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	second full paragraph	required to support the need for an ARAR waiver based on technical impracticability.	collected above Dundee Dam during the 17-mi RI shows that concentrations of some COPCs exceed New Jersey Surface Water Quality Standards. The 17-mile FS will include a technical evaluation to demonstrate the likely need for a TI waiver.
26	Page 2-6, Section 2.1.1.2, first bullet	Further clarification regarding fish windows as an ARAR should be provided. NOAA has not established a specific fish window for the LPRSA. Rather, fish windows are established on a yearly basis based on watershed and climatic factors.	This statement is consistent with EPA's discussion of this fish window (see below) in the lower 8-mile ROD. Please clarify what "further clarification" should be provided. The Region's lower 8-mile ROD Responsiveness Summary states on page 265 (H.4.3) "*based on comments and a review of fish windows recommended by NJDEP and NOAA's National Marine Fisheries Service during the Tierra Phase 1 Removal and RM 10.9 Removal work, EPA adjusted the fish window to 17 consecutive weeks, anticipated to occur from about March 1st to June 30th.*" The Region has anticipated in its lower 8-mile ROD schedule that NMFS will recommend fish windows that will restrict dredging activities during certain times of the year, and therefore it is important for the FS to recognize this likely restriction. Fish windows are likely to be developed as the Region's lower 8-mile ROD states in its ARAR Table from *"a fish migration study will be conducted during remedial design and consultation will occur with NMFS and the New Jersey Department of Environmental Protection (NJDEP) regarding fish windows."*
27	Page 2-6, Section 2.1.1.2, first bullet, third sentence	Please revise the text to present further justification of the 23-week dredging season. The expected timing of winter shutdowns should be discussed since, when combined with the fish migration work window, this will limit dredging operations. It would be reasonable to assume that dredging would take place 6 days a week with 1 day for equipment maintenance and other shutdowns.	The assumptions for dredging duration and dredging season were documented in Appendix H of the Draft FS, submitted to EPA on 4/30/15, and will be included with the revised memo. Reasonable assumptions were made based on lessons learned from past projects performed on the LPR and professional judgement. Appendix H is attached to the RTC.

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28	Page 2-6, Section 2.1.1.2, first bullet at bottom of page	The memorandum states that bridge opening notification and timing requirements are ARARs. Bridge opening notification and timing requirements should not be considered ARARs but should be addressed during the implementability evaluation. EPA does not consider this to be an ARAR	It is not clear why EPA does not consider LPR bridge opening notification and timing requirements an ARAR, given that they are specified in the CFR, and consistent with the EPA 1988 CERCLA guidance regarding ARARs: "*Other federal and state criteria, advisories, and guidance and local ordinances should also be considered, as appropriate, in the development of remedial action alternatives.*"
29	Page 2-7, Section 2.1.1.2, last bullet	Please revise the text to note that the Off-Site Rule also establishes requirements for any landfill that would accept contaminated sediment.	The text will be revised.
30	Page 2-8, Section 2.1.2.1, Adequacy and Reliability of Controls	Please delete all commentary on bank-to-bank remedial approaches and revise this section to discuss the adequacy and reliability of containment-based capping remedies. This should include an assessment of the long-term effectiveness/reliability of capping and any necessary operation and maintenance (O&M) and monitoring. In addition, please discuss the reliability and adequacy of other institutional controls, such as regulated navigation areas or other waterway use restrictions.	The text will be revised to be consistent with the remedies under evaluation for the upper 9 miles, including an assessment of the long-term effectiveness/reliability of capping, any necessary operation and maintenance (O&M) and monitoring, and the reliability and adequacy of other institutional controls, such as regulated navigation areas or other waterway use restrictions.
31	Page 2-9, Section 2.1.2.1, first paragraph	The blanket statement that alternatives based on a phased approach are more likely to be effective is overly broad and should be revised to discuss the potential need for additional cleanup measures that may be required. Any additional cleanup measure will require additional mobilizations, additional costs, and an extended time to attain protectiveness.	The text will be revised to clarify that phased approaches provide the opportunities to learn and adapt remedial activities to achieve effectiveness, which are not afforded by bank-to-bank approaches. Text will be added to acknowledge that additional cleanup measures may be needed and that there are costs associated with these measures.

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32	Page 2-9, Section 2.1.2.1, second paragraph	Please revise paragraph to address the challenges associated with asking Congress to deauthorize a channel that is still in use, and that capping within the channel therefore would be at best interim, unless the channel were dredged to the depth needed for reasonably anticipated use.	See General Response #6.
33	Page 2-10, Section 2.1.2.2	Please revise the text to discuss the process used to determine whether principal threat waste (PTW) is present at the site. Consistent with EPA guidance (A Guide to Principal Threat and Low Level Threat Wastes, November 1991), PTW includes non-aqueous phase liquid (NAPL) or areas "where toxicity and mobility of source material combine to pose a potential risk of 10^{-3} or greater." Consistent with EPA's sediment remediation guidance (Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, EPA-540-R-05-012, December 2005), the memorandum "should evaluate an alternative that includes treatment" for those areas where PTW exists. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that cannot be reliably contained or would present significant risk to human health should exposure occur. Based on the high concentrations of highly toxic, persistent and bioaccumulative chlorinated dibenzo dioxins and furans, PCBs and other key contaminants of concern present in the LPRSA, including in the removal areas, the analysis should focus on whether the material can be reliably contained.	See General Response #12.

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34	Page 2-10, Section 2.1.2.2, last paragraph, second sentence	The text states: "These technologies are not categorized as treatment under CERCLA, but are consistent with the NCP preference for engineering controls to address low threat wastes and reduction of the mobility and toxicity of COCs." This sentence implies that contaminated sediments within the LPRSA are low threat waste. Please provide clarification of this statement.	The text will be revised to clarify that if there are sediments that are classified as low threat wastes, these technologies provide engineering controls.
35	Page 2-10, Section 2.1.2.2, last paragraph, last sentence	Burial (or containment) does not reduce toxicity. Furthermore, it does not reduce toxicity or mobility through treatment, which is the criterion being discussed in this section. Based on studies to date, burial has not resulted in reaching acceptable, health-based contaminant levels (2016, EPA, FFS ROD). Although MNR in groundwater may represent a steady, predictable, reduction of certain contaminants, for the type and concentrations of contaminants in the sediments of this particular river system, (i.e., subject to sediment scour, resuspension, and other forces), MNR is likely not capable of reliably reducing contaminant mobility and toxicity. To be effective, MNR will need to be bolstered by implementation of other significant, active, remedial actions. Please revise the text accordingly.	The text will be revised to clarify that MNR does not involve treatment, but that reductions in contaminant mobility may be achieved through burial, and that reductions in toxicity and exposure may be achieved through burial, mixing, and natural attenuation of contaminant concentrations. Finally, the EPA's presumption that MNR can only be effective if "bolstered by other significant, active remedial actions" is over generalized and simply untrue.
36	Pages 2-10 through 2-12, Section 2.1.2.3	EPA's policy is to reduce the environmental footprint of the selected alternative, not to consider the environmental footprint in the evaluation of short-term effectiveness. EPA's Superfund Green Remediation Strategy (September 2010) states: "Green remediation is viewed as a means to enhance remedy protectiveness,	It is unclear why Region 2 is taking the position that energy use, greenhouse gas emissions, and resource consumption are only relevant in the evaluation of the NCP's nine criteria for remedial alternatives to the extent they give rise to site-specific impacts. Nothing in the NCP or EPA's RI/FS guidance restricts the evaluation of short-term effectiveness in this way. Consumption of energy and other resources and generation of emissions are appropriate to address in the evaluation of the nine NCP criteria to provide relevant

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		not as a disincentive to active remediation processes or an approach that reduces remedy protectiveness." Carbon footprint, in and of itself, is not one of the NCP's nine criteria used to evaluate alternatives and to select a remedy, and neither is "sustainability." Energy use, greenhouse gas emissions and resource consumption associated with remedial alternatives are considered part of the NCP's nine criteria to the extent they give rise to the site-specific impacts, such as would be evaluated under the short-term effectiveness of implementability criteria. Please revise this and all similar text accordingly.	information to the public on the impacts and tradeoffs associated with different remedial alternatives, and to provide information on those potential impacts so that they may be mitigated during remedy design and implementation. The CPG also questions the consistency of Region 2's position on this issue – which the Region also took in the Responsiveness Summary to the ROD for the lower 8.3 miles of the LPR – with EPA's mission and priorities. Further, the Region's comment is misplaced with respect to the text it addresses in the technical memorandum. There is no assertion or implication in the text that carbon footprint, in and of itself, is one of the nine NCP criteria. The text is appropriate as written and does not need revision. The CPG requests that EPA withdraw this comment.
37	Page 2-11, Section 2.1.2.3, Community and Worker Protection	It should be noted in this section, that in addition to quantitative PM10 monitoring and assessment, other types of monitoring may be indicated and performed based on the selected remedial alternative and associated design. It should also be noted that for large projects such as the LPRSA, substantial community engagement will be performed to identify, and plan for the mitigation of, short- term project impacts to the maximum extent possible. This was successfully performed as part of the Hudson River Project, using Quality of Life Performance Standards (QoLPS).	PM10 is mentioned in this section because it was the metric selected to evaluate short-term community impacts for the purposes of the FS. This section is not intended to identify the suite of monitoring activities that may be performed during remedial implementation or present community engagement plans. Text will be added to indicate that additional community impacts may be monitored.
38	Page 2-11, Section 2.1.2.3, Community and Worker Protection,	Contaminant exposure risk to workers participating in remedial activities will be related to the magnitude and duration of construction as well as the concentration in the environmental media being remediated (i.e., the average concentration remediated). The sentence should be revised to: "Potential physical hazards and	The text will be revised.

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	second paragraph, second sentence	risks to workers from exposure to contaminants and operational hazards such as light, noise, and air emissions are proportional to the magnitude of remedial construction, contaminant concentrations, and overall construction duration."	
39	Page 2-12, Section 2.1.2.3, first two full paragraphs	Dredge residuals should be managed through rapid placement of a thin sand cover to minimize exposure to these materials. In addition, best management practices (BMPs) can further minimize the generation of residuals. Please revise the text to include the evaluation of measures to limit and manage residuals, which would improve short-term effectiveness.	See General Response #11.
40	Page 2-12, Section 2.1.2.3, second paragraph, last sentence	The memorandum should remove references to specific projects such as the Fox River or the Hudson River and instead state generally that increases in fish tissue concentrations can occur immediately following remedy implementation but then decline over time.	It is not clear why EPA is directing that a general statement be made without support, when specific relevant supporting examples are available. The CPG will not remove the text referring to other sites.
41	Page 2-13, Section 2.1.2.4, Technical Feasibility, last sentence	The text states: "The effect of key constraints on implementability of an LPRSA remedy (Integral [in prep]) is proportional to the area and volume of materials to be removed and replaced from the river." It should be clarified in the text that a larger volume or area to be remediated represents greater widespread contaminant conditions necessitating more highly involved remedial actions in order to reach CERCLA-based risk goals. Furthermore, please clarify how dredging a larger volume is less technically feasible, other than it taking longer.	The text will be revised to clarify that widespread contaminant conditions, which may necessitate more highly involved remedial actions to reach CERCLA-based risk goals, may present greater technical implementability challenges than remedial actions of smaller scope and complexity. Larger volumes equate to larger more complex systems for transport, handling, dewatering, and storage of sediments, with inherent technical (and administrative) feasibility challenges. The text will be revised.

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42	Pages 2-14 through 2-15, Section 2.1.2.5	Cost, not "cost effectiveness", is one of the balancing criteria specified in the NCP. Although the NCP states that each remedial action selected shall be cost-effective, "cost effectiveness" is not considered in the development, screening, and evaluation of alternatives, but rather during the selection of the alternative. Please revise the text accordingly.	The text will be revised.
43	Page 2-14, Section 2.1.2.5, second paragraph	The text refers to the "statutory requirements of the NCP," please revise to "regulatory." Please make this change throughout the section.	The text will be revised.
44	Page 2-14, Section 2.1.2.5, second paragraph, last sentence	The text quotes the National Contingency Plan (NCP) as follows: "Costs that are grossly excessive compared to the overall effectiveness of alternatives may be considered as one of several factors used to eliminate alternatives (40 CFR 300.430(e)(7)(iii))." This refers to the screening stage, not the evaluation stage. Please revise the text accordingly.	The text will be revised. The FS will address cost-effectiveness in the comparative evaluation of alternatives.
45	Page 2-5, Section 2.2.1, Overall Protection	Please remove reference to the five review in Alternative 1. If this refers to the five-year review associated with lower 8.3 mile remedy, please clarify that in the text.	See General Response #7.
46	Pages 2-15 to 2-47, Sections 2.2-2.5	This portion of the memorandum requires revision consistent with previous EPA direction to revise and expand the list of alternatives evaluated, and since the evaluations were performed using some site characterization concepts and site evaluation methods	See Introduction and General Responses #1 and #8.

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		not approved by EPA. For example, consistent with the June 28, 2016 letter from Walter Mugdan, EPA Director, Emergency and Remedial Response Division to Dr. Robert Law, the top 15 cm of sediment must be used to represent contaminant concentrations applicable to the biological exposure depth, not the top 2 cm.	
47	Page 2-16, Section 2.2.2	The no action alternative would not meet chemical specific applicable or relevant and appropriate requirements (ARARs) such as surface water quality standards (SWQS). Action-specific and location-specific ARARs are not triggered since there is no action at any location within the LPRSA under this alternative. Please revise the text to clarify this statement.	See General Response #7.
48	Page 2-16, Section 2.2.3.1	The reference to the 30-year projection of a reduction in 2,3,7,8-TCDD SWACs of 29% for the 0 – 2 cm depth interval should be removed since the evaluation will focus on the 0 – 15 cm depth interval. This is consistent with the June 28, 2016 letter from Walter Mugdan, EPA Director, Emergency and Remedial Response Division to Dr. Robert Law, stating that the top 15 cm of sediment must be used to represent contaminant concentrations applicable to the biological exposure depth.	See General Response #8.
49	Page 2-17, Section 2.2.3.2, Adequacy and Reliability of Controls	The No Action Alternative should not include monitoring. If this refers to monitoring associated with the lower 8.3 mile remedy, please clarify that in the text.	See General Response #7.

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50	Page 2-18, Section 2.2.5.2	The no-action alternative should not include monitoring, as that would imply an action. The only monitoring discussed in the no action alternative would be monitoring associated with the actions that have already been performed. Please revise the text to clarify.	See General Response #7.
51	Page 2-18, Section 2.2.7	This section of the memorandum discusses the costs of reporting, institutional controls, and agency oversight under the no-action alternative. Discussion of cost is not appropriate here since these costs are associated with the early actions. Please revise the text accordingly.	See General Response #7. The text will be revised.
52	Page 2-19, Section 2.3, first full paragraph	The fish exchange and carp reduction measures have not been evaluated by EPA. Please update the text accordingly.	See General Response #10. The text will be revised.
53	Page 2-19, Section 2.3.1, first paragraph, fourth sentence	The text states: "Adaptive management may identify a need for additional actions to be implemented in areas that do not recover within an acceptable time frame." Please revise the text to provide more detail on specific triggers for additional actions within the proposed adaptive management framework. Specific contingent actions and the effect on overall protection of human health and the environmental of the delay in completing the remedial action should also be described for each alternative evaluated in a revised memorandum.	See General Response #2. A discussion of adaptive management and the development and application of interim targets was included in Appendix E of the Draft FS, submitted to EPA on 4/30/15, and will be included with the revised memo. Appendix E is attached to this RTC.
54	Page 2-19, Section 2.3.1.1, first paragraph,	The text states: "The baseline fish tissue PRG of 4 ng/kg (based on 1×10^{-4} cancer risks for the RME adult angler) is achieved in approximately 9 years following the start of remediation. The baseline PRG is not achieved in the	See General Response #10. The text will be revised to include risk reduction estimates in the absence of institutional controls.

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	third sentence	absence of exposure reduction measures over the 30-year projection period." This discussion is unclear. It appears that the memorandum incorrectly ties fish tissue concentrations to assumptions regarding the effectiveness of institutional controls (fish consumption advisories and fish exchange programs). The effectiveness of such institutional controls cannot be quantitatively estimated. The memorandum should estimate risk reduction in the absence of institutional controls and the effectiveness of institutional controls should be qualitatively estimated. Please revise the text accordingly.	
55	Page 2-21, Section 2.3.2, first paragraph, second sentence	The text states: "Alternative 2 may require one or more ARAR waivers during and after construction to meet the threshold criterion of compliance with ARARs." The text should describe which ARARs might require waivers and which waivers would be used. It is assumed that a technical impracticability (TI) waiver might be required for the New Jersey SWQS. However, other potential ARARs should be discussed in this section as well. Please revise the text accordingly.	The text will be revised to describe which ARAR waivers may be required.
56	Page 2-21, Section 2.3.3.1	Please revise the first sentence of the first paragraph for consistency with the June 2016 dispute resolution decision. The second paragraph refers to exposure reduction measures. Exposure reduction measures such as fish exchange could be viable as short-term risk reduction measure, but is not appropriate to factor into the long-term effectiveness analysis.	See General Responses #8 and #10.

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57	Page 2-22, Section 2.3.3.2, first paragraph, third sentence	The text states that "the need for future cap replacement is low." Please revise the text to provide supporting information for this statement.	During remedial design, a detailed capping evaluation will be performed, and a cap will be designed and implemented such that it will be expected to last. The text will be modified to clarify that the *anticipated* need for future cap replacement is low.
58	Page 2-22, Section 2.3.3.2, second paragraph, first sentence	Please clarify that Appendices E and F in the FS are the Conceptual Adaptive Management Plan and Long-Term Performance Monitoring.	The text will be revised.
59	Page 2-22, Section 2.3.3.2, second paragraph	This paragraph discusses the navigation channel, but it does not distinguish between the reaches that are still in use and those that are expected to be deauthorized as part of the lower 8.3 mile remedy. Revise the text accordingly.	See General Response #6.
60	Page 2-23, Section 2.3.3.2, last sentence	The text says that RAOs will be achieved within 10 years but does not address the schedule for "possible supplemental actions" which would extend the schedule beyond 10 years. Revise the text accordingly.	The text will be revised to clarify that, if the projected recovery is not achieved and supplemental actions are determined necessary, the timeframe to achieve RAOs would extend beyond 10 years.
61	Page 2-23, Section 2.3.4	Quantitative estimates of treatment should be provided (e.g., acres, cubic yards [cy], gallons, etc.). Please revise the text to provide assumptions regarding areas where in situ treatment will be used to reduce chemical toxicity and mobility (bioavailability) along with associated costs.	The text will be revised.

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62	Pages 2-24 through 2-25, Section 2.3.5.1	The text describes the impacts on the community resulting from bridge openings. As commented previously, the memorandum should consider measures to mitigate these impacts (e.g., low profile barges, hydraulic transport, etc.) and include these costs in the analysis. Please revise the text accordingly.	See General Response #3.
63	Page 2-25, Section 2.3.5.2	A discussion should be added to mitigate for temporal loss of habitat when the CAD cell is open. This would apply throughout where the CAD is analyzed.	A discussion of mitigation of temporal loss of habitat when the CAD is open will be added, consistent with the analysis in the lower 8-mile FFS/ROD.
64	Page 2-28, Section 2.3.6	Under Implementability, please include a discussion of deauthorization of the navigation channel.	See General Response #6.
65	Page 2-28, Section 2.3.7	Please use EPA guidance value of 7% for discount rate. An alternate rate can be included as a point of comparison.	The 7% discount rate is an inappropriate and unrealistic discount rate for current and future projects. The 2016 revision to Appendix C of the OMB guidance[1] (OMB 2016) suggests real discount rates for projects of various durations, ranging from 0.3% (3 years) to 1.5% (30 years), based on real rates of return for federal treasury notes and bonds. These rates reflect the changes in economic conditions since the publication of the 7% discount rate; over this period interest rates on 20-year treasury bonds and corporate bonds have dropped by 3% to 4% and money market yields have dropped to <0.1%. Changes in economic conditions since 1993 do not support Region 2's use of a constant discount rate over the same period. The use of a 7% discount rate provides misleading information to the public with respect to the true cost of remedial alternatives.

[1] OMB. 2016. Circular A-94 Appendix C. Discount rates for cost-effectiveness, lease purchase, and related analyses. Revised February 2016. Available at: http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c. U.S. Office of Management and Budget.

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			Nevertheless, cost estimates will be provided using a 7% discount rate as directed by EPA and a more realistic discount rate based on current OMB guidance.
66	Page 2-29, Section 2.4, first paragraph	Please remove the following: "not a requirement of the LPRSA AOC or under CERCLA" to consider the navigation channel. Please note that this comment also applied to Alternative 4 discussion.	See General Response #6. The text will be revised.
67	Page 2-29, Section 2.4.1.1, first paragraph, first sentence	The text states: "Alternative 3 is not expected to provide overall protection of human health for the entire 17.4-mile LPRSA." If this alternative does not meet the threshold criterion of protectiveness, it should be screened out from further evaluation. Alternative 3 includes bank to bank dredging and capping for RM 0 – 8.3 and is similar to EPA's selected remedy for the Lower 8.3 Miles of the LPR. Alternatives should be developed that include a range of remedial options for the upper portion of the LPRSA.	See General Response #1. A set of alternatives that encompass a range of remedial options will be developed and evaluated.
68	Page 2-32, Section 2.4.3.2, second paragraph	The second paragraph discusses additional controls and technologies during RD to address sediment contamination in constrained areas. This will be addressed in the RD for the lower 8.3 so it not necessary to address in the FS for the 17.4 miles. The need to dredge in the federal navigation channel to address navigation needs is not an institutional control. It is a legal prerequisite to either obtain deuthorization/modification. Please revise the text accordingly.	The CPG disagrees. If physical constraints are within remedial action areas in the upper 9 miles, it is appropriate for the CPG to retain a conceptual discussion of alternative controls and technologies in the FS. The text will be revised.

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69	Page 2-39, Section 2.5.1.1, first paragraph, first sentence	The text states: "Alternative 4 is not projected to provide overall protection of human health during the 30-year projection period." This statement seems to be based on an assumption of a long remedy construction phase. The evaluation should consider appropriate dredging production rates and risk reduction for 30 years following the completion of active dredging and capping within the LPRSA. In addition, the evaluation does not consider the added protection that might be provided by fish consumption advisories as was done for Alternative 2. Please revise the text accordingly.	The CPG's dredging productions rates are based on recent experience from other large environmental dredging projects and are appropriate rates. See General Responses #9 and #10.
70	Pages 2-44 through 2-45, Section 2.5.5.3	The evaluation of the risk reduction associated with Alternatives 3 and 4 does not assume the use of institutional controls. When the assumption of further risk reduction associated with institutional controls such as fish exchange programs, is removed from the evaluation of Alternative 2 (Tables 2-5, 2-7, and 2-8) the risk reduction is comparable to Alternatives 3 and 4. Because of the additional areas of contamination that will be subject to removal and/or capping under Alternatives 3 and 4, as compared to Alternative 2, further reductions in risk beyond the 30-year time period should be expected. Please revise the text to develop more realistic estimates of dredging and capping production rates and extend the project period to ensure that these effects are appropriately accounted for.	See General Responses #3, #4, and #9.
71	Page 3-1, Section 3.1.1, second	The text states: "Alternative 2 was developed by application of the 500 ng/kg RAL for 2,3,7,8-TCDD, which results in achievement of human health and ecological	The text will be revised to reflect the set of RALs and remedial alternatives evaluated and to describe the protection of human health and the environment for each alternative. Additional protection that

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	paragraph, last sentence	risk-based PRGs for 2,3,7,8-TCDD." Per Section 2, Alternative 2 meets the direct contact RAO but does not reduce fish tissue concentrations to protective levels. Protectiveness is assumed by quantifying a reduction in tissue levels associated with institutional controls, which is inappropriate. Please revise the text accordingly.	may be attained through implementation of institutional controls will be acknowledged but not quantified.
72	Page 3-2, Section 3.1.1, second paragraph after bullets	Alternative 4 does not include the use of institutional controls. When the assumption of further risk reductions associated with institutional controls is removed from Alternative 2, the resulting risk reduction at 30 years is comparable to Alternative 4. Furthermore, the significant amount of contaminant mass removed from the system under Alternative 4 should improve the effectiveness of Alternative 4 at T > 30 years. Please revise the text accordingly.	See General Responses #9 and #10, and RAE Specific Response #71.
73	Page 3-2, Section 3.1.1, footnote 5	Please clarify in the text why model results are not used to define conditions at the end of remediation similar to other discussions of projected results.	The revised COC mapping and model results will be used to evaluate the effectiveness of the alternatives. The text will clarify how evaluations were selected and performed.
74	Page 3-3, Section 3.1.1.1, first paragraph	Figure 3-2 presents background levels for total PCBs. However, Figure 3-1 does not present background results for 2,3,7,8-TCDD. Please revise the memorandum to provide sediment background estimates for 2,3,7,8-TCDD. These estimates should consider bedded sediment concentrations and suspended sediment particle concentrations upstream of Dundee Dam.	The background results for 2,3,7,8-TCDD will be presented.
75	Page 3-3, Section 3.1.1.1,	These last two sentences are irrelevant to the meaning of the paragraph. The last two sentences should be deleted.	The text will be revised.

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	second paragraph, last two sentences		
76	Page 3-3, Section 3.1.1.1, second paragraph, first sentence	The text states: "Only Alternative 2 (which includes exposure reduction measures) achieves EPA's target cancer risk range for human exposures to 2,3,7,8-TCDD from fish consumption (Figure 3-3)." Although Alternative 2 is inconsistent with EPA's selected remedy for the Lower 8.3 Miles of the LPR, the memorandum should provide additional detail regarding the use of fish consumption advisories to reduce risks to human health and evaluate these in a consistent manner between alternatives.	See General Responses #5 and #10, and RAE Specific Response #71.
77	Page 3-4, Section 3.1.1.2	Protection of the Environment: The tissue concentrations are targets, but are not PRGs. Please revise text.	See RAE Specific Response #21.
78	Page 3-4, Section 3.1.1.2	Please revise the text to discuss the assumptions regarding water quality controls during dredging. The use of water quality controls such as BMPs to reduce generation of residuals, placement of a thin sand cover as a residual management layer, and the use of silt curtains or sheet pile walls to minimize release of contaminants to the surrounding water column can minimize the flux of contaminants to Newark Bay during implementation of the remedy.	See General Response #4. General assumptions regarding water quality controls will be discussed.
79	Page 3-5, Section 3.2	It is an oversimplification to state that the balancing criteria weigh effectiveness and cost tradeoffs. There	The text will be revised.

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		are five criteria that are evaluated individually. Please revise accordingly.	
80	Page 3-5, Section 3.2.1.1	Please revise the text to note that while Alternative 3 includes bank-to-bank remediation downstream of river mile (RM) 8.3, no remediation takes place upstream of RM 8.3. This explains the lower effectiveness of this alternative and demonstrates why additional alternatives that address sediment contamination between RM 8.3 and 17.4 must be developed and evaluated.	The text will be revised to describe and compare the revised set of alternatives.
81	Page 3-5, Section 3.2.1.1	Figures 3-8 and 3-9 show that significant risk reductions for Alternatives 3 and 4 begin after approximately 15 years of remediation. It would be possible to achieve earlier reductions in risk by reducing the remediation period and/or releases of contaminants and residuals during remediation. Please revise the memorandum accordingly.	See General Responses #3, #9, and #11. The projections will support a comparative evaluation to address the RAO of contaminant migration.
82	Page 3-6, Section 3.2.1.2	Please revise the first paragraph to mention that Alternative 2 might require more work if monitoring does not confirm recovery. Also, Alternative 1 should not include monitoring as it is the no action alternative. Additionally, as previously discussed deauthorization of the navigational channel is not an institutional control.	The text will be revised to acknowledge the potential for additional monitoring and other controls if monitoring does not confirm recovery for any of the revised set of alternatives. See General Response #7.
83	Page 3-7, Section 3.2.2	Reduction in Toxicity: The second paragraph discusses resuspension/residuals. This should be addressed in short-term effectiveness. It Is not a basis to assign a “score” for this criterion. Please revise accordingly.	The potential impact of residuals will be evaluated under short-term effectiveness.

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84	Pages 3-8 to 3-10, Section 3.2.3	Global impacts are not addressed under the NCP analysis, only site-specific impacts. Revise the text accordingly.	See RAE Specific Response #36.
85	Page 3-14, Section 3.2.5, first paragraph, first sentence	The text references Table 3-2 which does not include rankings. Please correct this reference to Table 3-1.	The reference will be corrected.
86	Page 3-16, Section 3.4, second paragraph, third sentence	The scores stated in the text do not match Table 3-1.	The text/table will be revised.
87	Figures 3-10 and 3-11	Please arrange the panels on these figures in river mile order.	The figures will be revised.

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