Appendix G
Summary and Specific Examples of Region 2's Failure to Rely on Internal and External Technical Reviews

Comments on Behalf of the Lower Passaic River Study Area Site Cooperating Parties Group on the Proposed Plan and Feasibility Study for the Lower Eight Miles of the Lower Passaic River Study Area Portion of the Diamond Alkali Superfund Site

Region 2 has demonstrated a pattern of seeking support from technical experts from within the U.S. Environmental Protection (EPA), its Partner Agencies, and its external peer reviewers in the development of the Focused Feasibility Study (FFS) since 2008 and then summarily dismissing this advice and counsel if it does not support its presumption of the need for bank-to-bank dredging in the FFS study area. It can be reasonably concluded that these consultations with external resources appear to be **"checking the box"** rather than actually seeking technical support to develop an effective remedial decision for the Lower Passaic River Study Area (LPRSA). It is striking that many of the issues that are the focus of Cooperating Parties Group's (CPG's) technical comments on the 2014 Proposed Plan were identified more than 6 years ago in April 2008 by the Contaminated Sediments Technical Advisory Group (CSTAG) and the Region's external conceptual site model (CSM) peer reviewers and are still not satisfactorily addressed; these include

I. Risk of Recontamination, Targeted Remedies & Integrated CSM – CSTAG Principle 1,4,5 and 7

II. Impacts to the Public – CSTAG Principle 2

III. Appropriateness of Navigational Dredging & Future Use – CSTAG Principle 3

IV. Risk Characterization – CSTAG Principle 8

Unfortunately, it appears in most cases that the Region has done nothing with or ignored the recommendations. The following examples highlight the most egregious examples of Region 2's failure to heed the advice of its experts.

I. RISK OF RECONTAMINATION, TARGETED REMEDIES & INTEGRATED LPRSA CSM[1]

CSTAG and Region 2's external peer reviewers expressed concern about the significant risk of recontamination by sediment upstream and in Newark Bay. These comments are provided below.

A. April 1, 2008 CSTAG Comment -Principle #1: Control Sources Early.

- *"In order to more reliably predict the expected effectiveness of the remedial options in reducing risks, the Region needs to evaluate more quantitatively the relative contribution of risks from dioxin and PCBs entering from upstream (i.e., over Dundee Dam), from tributaries, from combined sewer outfalls (CSOs), and from instream sediments above mile eight and from Newark Bay. Therefore, CSTAG recommends that additional data be collected in order to better characterize the contaminant loads that enter the lower eight miles (i.e., from upstream of the early action area) and that enter the LPR from upstream of the Dundee Dam. The significance of inputs from downstream (Newark Bay) and lateral loading (from outfalls and tributaries) should be evaluated as well. ….. The Region should ensure that these data are adequate to ensure that there is not an on-going source(s) that needs to be addressed before taking action in the lower*

[1] 2008 CSTAG Comments, excerpts of CSM Peer Review Reports, and Region 2's responses to the CSTAG Comments are in italics – peer review comments and Region 2's response are included at the end of the appendix CPG comments are in plain text.

eight miles, to more reliably predict post-remedial surface sediment concentrations and to more accurately estimate long-term risk reduction in the lower eight miles that may result from any early action."

B. April 1, 2008 CSTAG Comment - Principle #5: Use an Iterative Approach in a Risk-Based Framework.

- *Region II should give additional consideration when revising the FFS to add one or more limited early action alternatives that address the highly contaminated erosional areas within the lower eight miles, for example, in the vicinity of the Diamond Alkali plant. The Region should perform additional analyses of all available data and/or collect additional sediment contaminant data and sediment stability data in order to adequately evaluate the potential effectiveness of these limited early actions. Due to our concern about the uncertainties associated with the data supporting the EMBM predictions, the CSTAG believes the existing information is insufficient to support the Region's conclusion that any early action addressing only a portion of the lower eight miles of the LPR would not be effective in reducing dioxin risks within the LPR or releases to Newark Bay.*

C. 2008 CSM Peer Review Comments

The following are three excerpts from the 2008 CSM Peer Review Report (LBG 2013[2]) that address primarily four comments (115, 117, 135, and 140) made by a peer reviewer and provided to the CPG after a request subject to the Freedom of Information Act (FOIA) (this report is not publicly available on the Region's web site ourpassaic.org) that clearly identify the Region's own peer reviewer's (1) concern about the significance of recontamination from primarily sources above RM 8 and Newark Bay, and (2) the development of a targeted remedy.

2008 CSM Peer Review Comment - 4.2 Potential Sources of Recontamination
Three of the peer reviewers were concerned by high concentrations of dioxin found in sediments above RM8. There was concern that remediation of the lower 8 miles might not be effective in the long term, based on the potential for erosion and sediment transport from fine-grained sediment deposits located between RM8 and RM12 to recontaminate the remediated areas in RM0-8.

The peer reviewers re-stated that the sediments between RM8-RM12, and perhaps to a lesser extent, sediments in Newark Bay, are of concern for implementation of a remedy in RM0-RM8. One panel member concluded that there is not a general belief among the peer reviewers that surface concentration projections associated with the remedial alternatives are reliable, without further investigation of potential erosional areas. This member did not believe the RM0-RM8 can be remediated without experiencing significant recontamination from RM8-RM12.

2008 CSM Peer Review Comment - 4.3 Potential for Targeted Remediation
Three of the reviewers felt that a remedial action should be focused on erosional areas with high contaminant concentrations close to the current sediment surface elevation. One of these reviewers also indicated that special attention should be paid to erosional areas near the 80 Lister Avenue plant site, while another advised against any dredging in depositional areas to avoid unnecessary release of contaminants during construction (dredging resuspension).

2008 CSM Peer Review Comment - 5.0 CONCLUSIONS
The peer reviewers recommended that contaminated, fine-grained sediments detected between RM8 and RM12 required further evaluation before a Source Control Action remedy could be selected for RM0-8 alone. The concern centered on potential recontamination of the remediation area in RM0-8 due to erosion and transport of sediments from RM8-12. Some peer reviewers opined that there was a benefit to further examining the RM0-RM12 portion of the river in detail

[2] The Louis Berger Group, Inc. (LBG). 2013. Lower Passaic River Restoration Project, Report of Peer Review of Conceptual Site Model. February 2013.

for depositional areas, erosional areas, and the depth of contamination, with the objective of tightening the spatial focus of the Source Control Action remediation; however, others pointed out in response that there is too much change from year to year in the location of depositional and erosional areas to confidently design such a targeted remedy.[3]

- *CSTAG Comment: The Region should use the information being collected as part of the RI/FS for the 17-mile LPR to refine the CSM and verify the basis for the early actions proposed for the lower eight miles.*

D. April 1, 2008 CSTAG Comment - Principle #4: Develop and Refine a Conceptual Site Model that Considers Sediment Stability.

- *Compare the underlying assumptions for the bases for the CSMs as described in the FFS for the early action plan and in the longer-term RI/FS, and if necessary, align them in order to ensure that data from future sampling efforts will be useful in making all remedy decisions.*

E. April 1, 2008 CSTAG Comment - Principle #7: Select Site-specific, Project-specific, and Sediment-specific Risk Management Approaches that will Achieve Risk-based Goals.

- *Projections of post-cleanup sediment concentrations appear unrealistically low. The CSTAG supports the Region's recent decision to reevaluate the level of post-remediation residual risk by incorporating more reasonable estimates of recontamination resulting from dredging and capping the lower eight miles. CSTAG also supports a more robust assessment of the potential for post-cleanup recontamination from upstream, lateral, and downstream sources, as discussed in Principle 1.*
- *The CSTAG recognizes the complexity of establishing risk-based cleanup goals when background concentrations present unacceptable risks, but it is not confident that the existing limited contaminant sediment concentrations above Dundee Dam are the most appropriate concentrations to use to represent background levels in the lower eight miles; additional analysis is encouraged.*

F. CPG Comments on CSTAG Principles #1,4,5 & 7.

Three excerpts from the 2008 CSM Peer Review Report (LBG 2013)[4] are provided above that primarily address 4 comments (115, 117, 135, and 140) made by peer reviewers. These comments clearly identify the Region's own peer reviewer's concern about the significance of recontamination from primarily sources above RM 8 and Newark Bay. Moreover, CSTAG recommended that "the Region needs to evaluate more quantitatively the relative contribution of risks from dioxin and polychlorinated biphenyls (PCBs) entering from upstream." However, instead of proposing measures to eliminate or control ongoing sources of contamination to the lower 8 miles of the LPRSA such as also addressing areas in the upper 9 miles, the Region ignored these concerns and continued with the FFS bank to bank alternatives that lack any source control measures. As discussed in Appendix B of these comments, Region 2's empirical mass balance (EMB) model estimates that the Upper Passaic River accounts for nearly one-third of the recently deposited sediments in the FFS study area while resuspension accounts for 48%. The Preferred Alternative with its bank-to-bank sand cap will reduce the internal resuspension to a negligible amount but do nothing to lessen the recontamination of the cap from the Upper Passaic River, its tributaries, and Newark Bay.

[3] See peer comments 115, 117, 135, and 140 and Region 2 responses from the 2008 CSM Peer Review Attachment B Table – p. 23 (LBG 2013) included at the end of this appendix.

[4] The 2008 CSM Peer Review report was provided to the CPG after a FOIA request (this report is not publicly available on the Region's web site ourpassaic.org)

As to CSTAG's concern that the Region's FFS alternatives will not reduce the transport of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD) to Newark Bay, the FFS Report states that "Alternative 3 would produce substantial reductions in the transport of contaminants in the water column towards Newark Bay." However, according to its own modeling, the Region's preferred alternative will only provide a modest 21% reduction (260 g) in the 2,3,7,8-TCDD flux into Newark Bay as compared to a No Action flux of 330 g from 2030 to 2059.

The FFS CSM does not include and consider all the data that has been collected as part of the LPRSA RI/FS as recommended by CSTAG. In fact, the CPG provided a preliminary CSM in December 2013 for the entire LPRSA, which the Region has (1) failed to consider in advance of its April 2014 FFS and Proposed Plan, and (2) has yet to discuss with the CPG—nearly 8 months after its submission. As such, Region 2 has clearly failed to align the FFS CSM and LPRSA CSM as CSTAG recommended.

The Region inexplicably changes its position on the development of preliminary remediation goals (PRGs), background, and its effects on attaining cleanup goals. As noted above, Region 2's own modeling indicates that sediment from the upper river will continue to have a profound effect and will be the dominant factor in driving recontamination and the inability to attain PRGs if a bank-to-bank alternative is implemented rather than a comprehensive cleanup of the entire LPRSA.

II. IMPACTS TO THE COMMUNITY

A. April 1, 2008 CSTAG Comment - Principle #2: Involve the Community Early and Often.

- *The Region should use the information in EPA's 2005 Contaminated Sediment Remediation Guidance for Hazardous Waste Sites and the 2007 National Research Council report: Sediment Dredging at Superfund Megasites Assessing the Effectiveness to assist in communicating to stakeholders that this site presents several challenges for effective dredging and capping, and that it may take many years, if not decades, to reach remediation goals (RGs) for this site.*

B. CPG Comments on CSTAG Principle #2 –

Region 2 has not provided an honest and clear assessment of the actual time and impacts to the community of its preferred alternative. At the Region's May 21, 2014, public meeting, Region 2 representatives were either unwilling or unable to provide an answer to number of bridge openings that would be required when asked by a Hudson County official. Region 2 representatives take great care in public in saying that they estimate that their dredging and capping will take 5 years, but that this time estimate does not include predesign investigations, design, permitting, pre-dredging construction and procurement. The time to conduct these "ancillary" activities will take at least 5 years and more likely 10 years. The Region's statements that the dredging of the lower 8 miles will start in 2018 and be completed in 2023 are without merit, foundation, and knowingly deceive the public.

III. APPROPRIATENESS OF NAVIGATIONAL DREDGING & FUTURE USE

A. April 1, 2008 CSTAG Comment - Principle #3: Coordinate with States, Local Governments, Tribes, and Natural Resource Trustees.

- **CSTAG Comment**: *Consider developing an alternative that addresses additional dredging for flood control but not for navigational purposes in the lower two miles. Region II could use this information on the differences in cost, short-term effectiveness, implementability, etc., as it evaluates the cleanup options for the site.*
  - **Region 2 Response***: Region 2 will evaluate a new alternative in the FFS that includes capping the sediments of the lower 8 miles of the river, with pre-dredging so as not to cause additional flooding, but with no navigation channel.*

- **CSTAG Comment**: *Coordinate with local and state governments to understand what the realistic and reasonable anticipated future land uses will be for the LPR. The Region's understanding of the future land uses of the riverfront and river itself may impact the suite of remedial alternatives that are to be evaluated in the revised FFS for early action and, potentially, in the RI/FS for the 17-mile study area.*

  - **Region 2 Response**: *Region 2 has held extensive discussions with the State of New Jersey on the reasonably anticipated future uses for the Lower Passaic River. As a result of those discussions, the FFS is being reconfigured to reduce the number of capping alternatives that retain a navigation channel, and that channel is being limited to the lower two miles of the river. In order to justify the need for commercial navigation in the lower two miles, Region 2 and the State of New Jersey have met with the City of Newark to review its Master Plan and other documentation of reasonably anticipated future land use. The FFS will be revised to include an appropriate justification supporting navigation in the lower two miles and the alternatives that provide for it.*

  - *In order to understand the reasonably anticipated future uses for the Lower Passaic River above River Mile two, the Region organized two municipalities' workshops (in April and July 2007) to discuss revitalizing the river in conjunction with the Early Action and 17-mile Study. Each workshop was well attended by municipal officials and community groups. In general, they confirmed the results of a memorandum prepared by the State of New Jersey presenting recommendations for future navigational use of the channel (Appendix F of the draft FFS of June 2007), which was based on surveys of municipal planning officials and review of municipal master plans.*

B. CSTAG Comment - Principle #9: Maximize the Effectiveness of Institutional Controls and Recognize their Limitations.

- **CSTAG Comment**: *If capping is selected as part of an early action remedy, it will be important to evaluate which institutional controls will be needed to protect the integrity of the cap in light of any planned future navigational uses and construction activities in or bordering the river. It will also be important to evaluate and identify who will be responsible for ensuring that these controls remain in place over the long-term.*

  - **Region 2 Response**: *The need for institutional controls specifically to protect the integrity of a cap is discussed at several points in the draft FFS. If capping is selected in the Record of Decision, institutional controls needed to protect the integrity of the cap will be delineated and responsibilities for enforcement will be identified.*

C. CPG Comments on CSTAG Principles #3 & 9.

Region 2 agreed to follow through on CSTAG's comment to develop a bank-to-bank remedy with no navigational dredging but failed to do so in the 2014 FFS and Proposed Plan. The Region provides no rationale for its decision to ignore its previous commitment to CSTAG.

The Region is not forthcoming in the fact that large portions of the lower 8 miles of the river will have significant restriction and limitations and as a result may be unusable with regard to recreational boating (anchoring and access); the construction of piers and docks of piers and docks for both recreational and commercial use may be restricted.

IV. RISK CHARACTERIZATION

A. CSTAG Comment - Principle #8: Ensure that Sediment Cleanup Levels are Clearly Tied to Risk Management Goals.

- **CSTAG Comment**: *Because it will likely take many years or even decades to achieve Remedial Action Objectives, both long-term and short-term or interim remediation goals should be developed for fish and crab tissue. Because many consumers eat only crab muscle, goals based on the ingestion of just muscle should also be presented. The time to achieve these goals should be estimated for each alternative.*

  - **Region 2 Response***: Both short-term and long-term remediation goals for fish and crab tissue were developed for the draft FFS (June 2007). The methodology is developed in Appendix B of the draft FFS and the resulting Preliminary Remediation Goals (PRGs) are presented in Table 4 of that appendix. The FFS will be updated to present that information.*

  - *The New Jersey Department of Environmental Protection (NJDEP) is the lead agency for establishing fish and crab consumption advisories for the State of New Jersey, including the Lower Passaic River. NJDEP's crab consumption advisories are based on data from surveys of urban anglers around the Newark Bay complex. When crabbers were asked if they eat the hepatopancreas, a percentage (15% in 1995) indicated that they eat this part of the crab. NJDEP also found that since the crab is cooked whole, even those consumers who do not deliberately eat the hepatopancreas are likely exposed to all or part of its contents due to its fluid nature and its dispersion in the cooking liquid. In addition, NJDEP found that 40% of crab consumers in 2005 used the cooking liquid to flavor other foods. Therefore, even though NJDEP's advisories for crab consumption include narrative recommendations for cooking practices to remove the hepatopancreas to reduce potential exposure, the advisories themselves are calculated based on consumption of the whole crab. A review of EPA guidance on fish and shellfish consumption advisories indicates that NJDEP's approach is consistent with how most other states issue shellfish consumption advisories. Since PRGs must be protective of the Reasonable Maximum Exposure (RME) individual and since Region 2 considers it unlikely that NJDEP would issue advisories specifically for consumption of crab muscle, we believe it is inappropriate to establish PRGs based on ingestion of only crab muscle.*

- **CSTAG Comment**: *The risk assessment should also estimate risks from direct contact exposure scenarios (e.g., recreational user and construction worker) and develop RGs for these exposures. This information can be used to inform the community about risks due to direct contact with sediment and surface water.*

  - **Region 2 Response***: Risks from direct contact exposure will be evaluated in the 17-mile RI/FS. The data available in the Lower Passaic River are too limited for direct contact exposure to be evaluated in the FFS for the Early Action. However, this was not considered a significant limitation on remedial decision-making for the Early Action, since the results of other Superfund human health risk assessments for similar river sites and bioaccumulative chemicals of potential concern (i.e., Hudson River, Housatonic River, and Centredale Manor) have demonstrated that consumption of fish and shellfish is associated with the highest cancer risks compared to direct contact.*

- **CSTAG Comment**: *The CSTAG suggests that the Region consider placing more emphasis on the potential benefits from reducing dioxin loading to Newark Bay than on achieving significant risk reduction in the LPR itself. It may also be helpful to explain the anticipated benefits of the proposed action to ecological resources (i.e., beyond what was presented in the screening ecological risk assessment) in the LPR and Newark Bay.*

  - **Region 2 Response**: *It is a statutory requirement (CERCLA 121(d)(1)) that remedial actions attain a degree of cleanup of hazardous substances which assures protection of human health and the environment. Thus, the Early Action must achieve significant risk reduction in the Lower Passaic River itself. However, the FFS will be updated to place more emphasis on the potential benefits from reducing dioxin loadings to Newark Bay in addition to achieving risk reduction in the Lower Passaic River.*

B. CPG Comments on CSTAG Principle 8 # –

The refusal on the part of Region 2 to include a crab-muscle-only consumption goal is yet one more example of the Region's practice to make overly conservative, unrealistic assumptions about fish and crab consumption in the LPRSA. First there is almost no data indicating that there is any measurable consumption of crabs from the LPRSA. Second, Region 2 readily admits that only 15% of crab consumers actually consume the hepatopancreas and that is an estimate that is nearly 20 years old and only 40% use the cooking water. Third, the Region fails to consider cooking loss in its calculations; wrongfully assuming that all chemicals are retained in the tissue and cooking water and always consumed.

The Region has not included direct contact risks for the FFS but relies on fish and crab consumption to characterize risk in support of the preferred alternative. However, if the Region was to consider the sediment data collected in 2013; these data indicate that any direct contact risks are confined to discrete portions of the lower 8 miles that could be addressed by a targeted remedy.

As previously noted in Section I of this appendix, the FFS Report states that "Alternative 3 would produce substantial reductions in the transport of contaminants in the water column towards Newark Bay." However, according to its own modeling, the Region's preferred alternative will provide only a modest 21% reduction (260 g) in the 2,3,7,8-TCDD flux into Newark Bay as compared to a No Action flux of 330 g from 2030 to 2059. The Region has failed to develop a remedy that significantly reduces the flux of 2,3,7,8-TCDD to Newark Bay.

Comment No.	Charge Category	Charge Question	Comment Summary	Substance of Response
115	Appropriateness of Conclusions	12	An optimal approach to remediation could well involve more focused (and less costly) remediation of specific high-risk source areas, but such scenarios cannot be evaluated within the current framework. If the EMBM forecasts are used as a basis for Early Action decision, other lines of geochemical evidence need to be used to remediate the highest-risk locations first, with provisions for adaptive management to adjust the remedy as additional information is collected.	Multiple bathymetric surveys show that erosional and depositional areas shift unpredictably from year to year, so that it would be impossible to find a discrete erosional area to remediate. In addition, high concentrations of dioxin and other contaminants exist throughout the surface sediments of RM 0-8, so that targeted remediation aimed at cutting off the source of contamination would fail to address the high levels of risk that exist throughout RM 0-8. However, as recommended by the peer reviewers, a fine-grid sediment transport model based on SEDZL-J is being run to investigate the possibility of focused remediation of discrete erosional areas.
117	Appropriateness of Conclusions	12	It is clear, as stated (p. 11-40), that “much of the river bottom is subject to large movements of several inches of sediment, resulting in multiple layers of deposition of alternating silts and sands.” It does not necessarily follow from this observation that remedial alternatives must address the entire sediment bed of the lower eight miles of the river - although that is the only alternative that the EMBM approach is really capable of evaluating	
135	Appropriateness of Conclusions	12	The reviewer has some reservation with the idea of only remediating fine grained depositing, but also resuspending, sediment in the RM 0-8 compartment. From Fig. 7-1 it is apparent that there is a significant dioxin source at RM 11.5. Before remediating the RM 0-8 stretch once should consider removing high dioxin sediment erosion source areas such as those around RM 11.5.	The magnitude of the reservoir of material at RM 11 is substantively smaller and less thick than the inventory below RM 8. Based on the dated sediment cores, there was no measureable gradient between RM 2.2 and RM 11 in the decade prior to the circa 2000 release event. Additionally, about 86% of the fine-grained sediment surface area is located below RM 8 and only 6% of the fine grained area is located between RM 8 and RM 12. Even if the dioxin concentrations in surficial sedi ments between RM 8 and RM 12 were twice as high as those in the lower 8 miles, the flux from the sediments below RM 8 would still be seven times greater than the flux originating in RM 8-12, assuming that the rate of fine-grained sediment resuspension is proportional to the fine-grained sediment surface area. Therefore, the fine-grained sediments below RM 8 remain the single-most important source of dioxin to the Lower Passaic River. Also, EPA will be using the sediment transport model SEDZLJ to evaluate whether a remediation should start in RM 0-8 or RM 8-12.
140	Appropriateness of Conclusions	12	Remediation should proceed in three stages: First remediate upstream hot points such as dioxin around RM 11.5. Considering the heterogeneity of the RM 0-8 stretch with respect to contaminant concentrations and sedimentation rates, I think one should next design a remediation plan for perhaps 20% of the RM 0-8 stretch concentrating on sites with high contaminant concentrations that are likely to undergo resuspension frequently. The third step, if necessary, would be removal or capping of most of the remainder of the river stretch.	See response to Comment 135 on remediation above RM 8. As to detailed procedures for remediation within RM 0-8, the design of the remedy will take into consideration these types of concerns and is not part of the Focused Feasibility Study.