



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

May 18, 2006

Mr. Thomas Macchiarella, Code 06CA. TM
Department of the Navy
Base Realignment and Closure
Program Management Office West
1455 Frazee Road, Suite 900
San Diego, CA 92108-4310

Re: Review of the Draft Remedial Investigation Report IR Site 20 (Oakland Inner Harbor) and IR Site 24 (Pier Area), Alameda Point, Alameda, California, March 2006

2006 MAY 30 10:18

BRAC OFFICE

Dear Mr. Macchiarella:

The U.S. Environmental Protection Agency (EPA) Region 9 has received the Draft Remedial Investigation Report IR Site 20 (Oakland Inner Harbor) and IR Site 24 (Pier Area), Alameda Point, Alameda, California, dated March 9, 2006. We have reviewed the aforementioned document and our comments are enclosed.

If there are any questions, please feel free to contact me at (415) 972-3002.

Sincerely,

A handwritten signature in cursive script, appearing to read "Xuan-Mai Tran".

Xuan-Mai Tran
Remedial Project Manager
Federal Facilities and Site Cleanup Branch

cc: Andrew Baughman, BRAC PMO, West
Mary Parker, BRAC PMO
Judy Huang, SFRWQCB
Dot Lofstrom, DTSC Sacramento
George Humphreys, RAB Co-Chair
Peter Russell, Russell Resources, Inc.
John Chesnut, EPA

**Review of the Draft Remedial Investigation Report
IR Site 20 (Oakland Inner Harbor) and IR Site 24 (Pier Area)
Alameda Point, Alameda, California
March 2006**

GENERAL COMMENTS

1. In Section 4 temporal differences in the distribution of organic and inorganic constituents are difficult to assess because the sampling did not reoccur in the same location. Even though there are sampling sites that are proximal to one another among the various years studied, the differences over time could be interpreted as spatial differences because the sample locations are not co-located. This is of particular concern when locations in 2005 have lower concentrations than previous years, yet these sites are at a greater distance from the outfall and the shore. Temporal analyses should be limited to co-located sample locations and to locations that are the same distance from the sources (i.e., outfalls and piers). Please limit the comparison of temporal differences in constituent distributions to co-located samples and to those samples that are located the same distance from outfalls and piers.

2. Analytical sampling results for site sediments were compared to background, or “ambient” chemical concentrations in the Draft Remedial Investigation Report, IR Site 20 (Oakland Inner Harbor) and IR Site 24 (Pier Area), Alameda Point (the RI Report), but it is not clear how the background information is being used or when it is being applied in the risk assessment process. Furthermore, it is not clear that information obtained on the “ambient background levels for San Francisco Bay” is appropriate for use as representative background values. For example, additional discussion should be provided to clarify that the background data is representative and useable; and to provide sampling depths, analytes examined, the date when the data was collected, sampling methodologies used for data collection. In addition any assumptions associated with the data set and discussion of background locations relative to the IR sites should be discussed. Some of this information appears to be provided in sections spread throughout the RI Report, but the RI Report should be revised to provide the additional requested information, along with all other information regarding the methodologies and assumptions used for collecting and using background data sets, in one complete comprehensive section. Please revise the RI Report to include this information in one section.

3. The environmental data sets collected for the various ecological measurement endpoints appear to have been gathered independently and were not always spatially or temporally co-located. For example, it appears that the bioassay analyses were completed in 1998 for IR Site 24, but it appears that the sediment sample analyses were completed at different time periods. Additional information should be provided in the RI Report in order to aid in assessing the connection between bioassay analysis results and contaminant concentrations. Please revise the RI Report to provide the types of data collected for each sampling event for each site, to provide a time-line that lists all of the

activities and analyses or tests for each event, and to discuss any uncertainties that may arise from the spatial and temporal gaps between measurement endpoint sampling efforts.

4. It is unclear whether the default value is one-half the detection limit or one-half the reporting limit. Since the detection limit and reporting limit can vary by as much as a factor of 5, consistency is important. For example, the second bullet at bottom of page 13 indicates that the reporting limit was used, but in numerous other places throughout the RI Report, such as in the second bullet on Page 14 the detection limit is referenced. Please resolve this discrepancy.
5. The information provided in figure form for data results is useful and aides in interpretation of the information obtained for the ecological risk assessment (ERA) effort. However, the inclusion of additional figures would be useful for interpreting the data, including a site map showing selected chemicals of potential ecological concern (COPECs) hazard quotient (HQ) exceedance for sampling locations, and the HQ values for various receptors. This information provides a clearer picture of which COPECs might be risk drivers based on spatial examination of HQ exceedance. Please consider revising the RI Report to include this information for compounds that appear to be the major risk drivers at the IR sites.
6. It is unclear why marine mammals were not selected as receptors of concern (ROCs) for the IR sites. Section 6.2.1.4 indicates that mammals such as the seal lion and harbor seal could be present in the site area. Please revise the RI Report to provide further justification for not selecting marine mammals as potential ROCs, or include this receptor in the ERA process.
7. It is unclear why measurement endpoints are not provided and discussed for the associated assessment endpoints for the screening-level ecological risk assessment (SLERA) portion of the RI Report. Please revise the RI Report to include measurement endpoints for the assessment endpoints provided in the SLERA. These measurement endpoints can then be modified as necessary in the baseline ecological risk assessment (BERA).

SPECIFIC COMMENTS

1. **Executive Summary, Page vii:** The text describing the distribution of analytes at Sites 20 and 24 states that the distribution is “relatively uniform,” and that concentrations do not generally exceed Effects-Range Median (ER-M) values, but as discussed in several comments below, there are areas of both sites where there are elevated concentrations of both inorganic and organic constituents. There are also several exceedences of ER-Ms at each site. Please revise the text to provide a more accurate description of the distribution of inorganic and organic constituents and acknowledge the ER-M exceedences.
2. **Section 1.0, Introduction, Page 1 and Section 2.1.1, IR Site 20, Page 3-4:** The description of Site 20 in relationship to Todd Shipyards appears to contradict Figure 2-2.

Most of Site 20 is to the west of Todd Shipyard, and is not offshore from Todd Shipyards as implied by the statement in the text. Please resolve this discrepancy.

3. **Section 2.1.1, IR Site 20, Pages 3 and 4:** Although the text describes dredging in the Oakland Inner Harbor, it is not clear how much of Site 20 would be impacted by dredging. Please clarify the extent of the impact that dredging would have on Site 20.
4. **Section 2.1.2, IR Site 24, Page 4:** The text states that radiological compounds were eliminated from further consideration from the site based on the results of a Historical Radiological Assessment (DON, 2000), and an independent U.S. EPA study. However, as a conservative measure, Ra226 and Ra228 were retained for further consideration of potential ecological exposures at the IR sites. No information is provided in the RI Report regarding the methods and results of these studies, such as a general discussion of how radiological compounds were screened to evaluate potential risk of ecological exposures, whether data from the assessments was collected at or near the IR sites, or even the reference for the U.S. EPA study. Please revise the RI Report to include a general summary and presentation of the information contained in the two referenced RI Reports in order to support the approach presented for examining radionuclide compounds at the IR sites.
5. **Section 2.2.1, IR Site 20, Page 5:** Information contained in this section indicates that tidal marsh habitat within the vicinity of the site area is limited. However, there is no information about the size of actual tidal marsh habitat available in the area. Please revise the RI Report to provide the actual percentages of habitat types present near and within the site areas, as well as a map depicting these habitat areas. In addition, this section should also be revised to provide a full reference for the March 2001 sediment study that was cited to support the claim that the soft, undredged sediment shelf in the area is expected to be less extensive than previously believed.
6. **Section 2.2.2, IR Site 24, Page 5:** Please provide a better description of the location of the sediment shelf and include this feature on a figure.
7. **Section 2.4.1, IR Site 20, Page 6:** It is stated towards the end of the first paragraph that historical sediment samples collected to the west of IR Site 20 were not included in the RI Report, as the samples were outside the IR boundary and did not contain chemicals at potential levels of concern. However, it does not appear that the data and results of the data screening have been presented in the RI Report for review. It is important to provide this information in order to justify the statements made in this section. In addition, this data could provide useful information on the nature and extent of contamination in the area. Please revise the RI Report to include the samples in the ERA analysis, or provide further justification as to why these sample results were not provided for initial review before being removed from the risk assessment process.
8. **Section 2.4.1, IR Site 20, Page 8:** It is stated in the second paragraph that, "Historical dredging of piers is likely to have removed much of the contamination associated with wastewater discharges along the piers." No information has been provided to support this

claim, such as confirmatory sediment sampling results from the dredged areas. In addition, dredge materials are often compiled into bank material immediately adjacent to the dredged area, creating a new exposure scenario of potential concern. Please revise the RI Report to provide more information to support the claim that dredge spoils were actually removed and that the remaining material has decreased COPEC concentrations, or remove the quoted statement from the RI Report.

9. **Section 2.4.2, IR Site 24, Page 8:** The text states that “a core sample was collected from a reference station outside of the footprint of IR Site 24 to characterize ambient surface sediments that have not been influenced by the pilings or outfalls,” but this location is still within the breakwater. Since sediment contaminated by discharge from the outfalls may have been redistributed inside the breakwater, information about current and historic sediment transport pathways needs to be considered before it can be concluded that this location has not been influenced by the pilings or outfalls or that it is representative of ambient conditions. Also, it is unclear if the breakwater is composed of the same material as the pilings. Please discuss the composition of the breakwater and specify whether it was constructed of wood with creosote. Then, please present an evaluation of sediment transport within the breakwater, including the pier area and outfalls. This evaluation should include sediment transport during tidal changes, storms that originate from different directions (e.g., during conditions with high wind and waves), and due to movement of large ships.

10. **Figure 2-2, Alameda Point:** This figure depicts Site 24 as a small area between piers 1 and 2 but the written description in section 2.1.2, paragraph 1, page 4, includes the area surrounding all three piers. Please change the map to illustrate total area of Site 24.

Also, Figure 2-2 indicates that Site 20 is offshore of a portion of Site 28, but Figure 2-4 indicates that Site 20 is offshore of all of Site 28. Please resolve this discrepancy.

11. **Figure 2-3, Storm-Sewer Lines and Outfalls at Alameda Point:** Figure 2-3 does not identify the locations of buildings referenced in Section 2.1.2. The relationship between buildings and respective activities would facilitate interpreting data associated with the outfalls. Please label buildings referenced in section 2.1.2 on Figure 2-3.
12. **Figure 2-7, IR Site 24 Sampling Stations:** Some sample stations listed in Appendix A data are missing from the map. Please include sample stations PA 11 through PA 30 of 1997 data set on Figure 2-7.
13. **Table 2-1, Summary of Development and Potential Historical Sources and Releases to the Offshore Sites, Page 163:** The importance of the construction of the San Antonio Channel is not clear. Please indicate the significance of this event in relation to sources or releases to the offshore sites.
14. **Section 3.1.2, Transport Mechanisms, Surface Runoff, Page 9:** It is stated in the first paragraph that a 1999 on-site storm water investigation found that for IR Site 20, engineering controls, wastewater treatment systems, and waste management

improvements have reduced discharges to off-shore areas but there is no specific information about these controls, systems, and improvements, nor has any analytical data been presented to verify this claim. Please expand this section to provide a more complete discussion of storm water discharges to off-shore areas, and further justification that discharges, and therefore contaminant loading, have been reduced for this transport pathway.

15. **Section 3.1.2, Transportation Mechanisms, Page 9:** The only transportation mechanisms in this section are surface runoff and food chain transport, but other mechanisms for transportation should be considered. Contaminants could be transported in groundwater and discharged into sediment; this pathway is considered in the IR Site 28 RI as a source of metals to Oakland Inner Harbor, so it should also be considered for IR Site 20. In addition, wave action, harbor activity and bioturbation can mobilize sediments, resuspending them into the water column and resulting in contaminant transport. Please include these transportation mechanisms in this section and on Figure 3-1.
16. **Section 3.1.2, Transportation Mechanisms, Page 10:** The second full paragraph on the page states the rationale for excluding surface water as a potential contaminated media at the site, but there is no rationale for the three reasons. The text should be expanded to include a more complete description of the rationale for each of the three presented points, in order to justify excluding surface water as an exposure pathway. For example, for the first listed rationale, specify the COPECs detected at the site, provide a general discussion on site-specific sediment and water chemistry, and include further information on these COPECs to justify the statement that they are fairly insoluble and will not partition under site-specific conditions, among others. Please revise the RI Report to include this information.
17. **Figure 3-1, Conceptual Site Model for Offshore Sites at IR Site 20, and Figure 3-2, Conceptual Site Model for Offshore Sites at IR Site 24:** The two Conceptual Site Models refer to oil-water separators (OWSs) as a potential source of contaminants, but it does not appear that any information is provided in the RI Report about these potential sources. Please revise the text in Sections 2 and 3 to include this information.
18. **Figure 3-2, Conceptual Site Model for Offshore Sites at IR Site 24:** Under primary sources on the flow chart the sixth text box has the words “Creosote treated,” but this should read “creosote treated pilings,” based on the text in Section 3.1.1. Please correct this figure.
19. **Section 4.1.1, Data Preparation, Page 14:** The first bullet on the page states that field duplicate samples were excluded from data sets, unless the primary sample was qualified as rejected, but field duplicate samples should be presented and used as part of the risk assessment. In addition, the discussion nature and extent of contamination should include a discussion of whether field duplicate results were higher or lower than the primary sample data. Please revise the RI Report to include all field duplicate data in the ERA

process and to include a comparison of field duplicate analytical results with primary sample data in the nature and extent of contamination discussion.

20. **Section 4.1.2, Sediment Chemistry Box Plots, Page 15:** It is stated in the third paragraph that data points falling outside of the “whiskers” of the box plots should be considered outliers, but this implies that the data may have been removed from the data sets based on evaluation of the data as an outlier. Please clarify whether data points were removed from the data sets, along with appropriate information to justify removal of the data point (e.g., a laboratory mistake resulted in an elevated value, specific field conditions that indicate the sample is unreliable, etc.).
21. **Section 4.1.2, Sediment Chemistry Box Plots, Page 15:** It is stated in the fourth paragraph that when replicate samples were taken, the average of the replicate and primary sample was presented for box plots, but it is unclear why replicate samples are being averaged for presentation in the box plots, and whether this averaged data is being used for the data set in the risk assessments. Please revise the RI Report to clarify and justify this methodology.
22. **Section 4.2.1.1, Surface Sediment Spatial Distribution, Page 17:** The statement is made in the third paragraph that the 1993 sampling results for antimony are erroneous, based on the fact that subsequent sampling failed to show the same elevated concentrations, but no information has been included to support this argument and samples were not collected from the same locations during later sampling rounds. Please delete this statement, or provide further information to justify the conclusion that the 1993 antimony data set is not representative of sediment conditions at that time period and in those sampling locations.
23. **Section 4.2.1.1, Surface Sediment Spatial Distribution, Pages 17 and 18:** Although the text states that “locations of higher concentrations were sporadic and not consistent through time,” but samples were not collected from the same locations during each sampling event, so this statement should not be made. Also, this section is supposed to include a discussion of spatial distributions, not temporal distributions. Please delete the quoted statement.

In addition, there are patterns of contamination, so it is not clear why the text says that locations with higher concentrations were “sporadic.” Three metals associations can be observed. 1) There are high concentrations of lead, copper, mercury and zinc in the portion of IR 20 that is offshore from Todd Shipyards. Since copper, mercury and zinc were used as antifouling additives to lead paint, the association of these four metals suggests the presence of spent sandblast grit in sediment. Similarly, in the western portion of IR-20, there is a location with high concentrations of antimony and cadmium. In the vicinity of Stations 28 and 57, it appears that the same or adjacent locations have high concentrations of copper, lead, and chromium, which may indicate discharge from metal plating and other metal-working operations. Please discuss these contaminant associations in the text.

24. **Section 4.2.1.1, Surface Sediment Spatial Distribution, Page 17 and Section 4.2.1.2, Surface Sediment Temporal Distribution, Page 18:** The text in these sections attributes temporal difference to differences in testing methodology, but the sample locations for each year of study were different, so it is not appropriate to attribute all of the observed variability to different analytical methods without providing information to substantiate this conclusion. The variable sample locations could account for some of the apparent discrepancies in contaminant distributions. Please discuss the impact of spatial variability of the sampling locations on the apparent distribution of contamination.
25. **Section 4.2.1.3, Subsurface Sediment Spatial Distribution, Page 18:** The text states that sediment samples from the 20 to 50 centimeter (cm) sampling interval were frozen for possible later analysis, but there is no information about whether freezing sediment samples is an acceptable method, how this method may impact specific chemicals contained in sediment samples, or what specific requirements or assumptions are related to the use of this method. Please revise the RI Report to include this information.
26. **Section 4.2.2.1, Surface Sediment Spatial Distribution, Page 19:** The text in paragraph 3 of Section 4.2.2.1 includes a conclusion that the observed pattern of polynuclear aromatic hydrocarbons (PAHs) “can be an indication that the observed pattern is associated with urban background,” but this is not the only explanation for the observed pattern. Further, the only information provided in the RI Report to support this conclusion is a brief discussion stating that PAH compounds were plotted for comparison to “urban background signatures,” but no information is provided on the approach of using anthropogenic background concentrations for selecting COPECs. For example, no information is provided to justify the data referenced from these studies are appropriate for use (e.g., comparable that sampling methods, analysis methods, sampling locations, sampling depths, site-specific conditions, etc.), much less the use of anthropogenic background or selection of organic COPECs based on a background screen in the ERA process. The observed PAH distribution pattern is most likely the result of discharges from the outfalls, which included industrial sources, and subsequent redistribution of sediments and the associated contamination; this appears to be substantiated by the fact that PAH concentrations in Site 20 sediment are higher than those in the San Francisco Bay comparison data set (Figure 4-8). Therefore, it should not be concluded that the observed pattern of PAHs can be attributed to urban background in this section or in Section 4.2.4 without substantiating the conclusion. Please discuss the comparison with urban background signatures in detail and or delete the quoted statement. In addition, please discuss the fact that the observed distribution is the result of discharges from the outfalls, which included industrial sources, and subsequent redistribution of the sediments and associated contaminants. Also, please remove the use of anthropogenic background and selection of organic COPECs base on a background screen for the SLERA and BERA.
27. **Section 4.2.2.2, Surface Sediment Temporal Distribution, Page 20:** The text states that “PCB concentrations appear to have declined over time,” but the 1993 and 2001 samples were not collected from the same locations, so this conclusion cannot be made. Please delete the quoted statement.

28. **Section 4.2.2.3, Subsurface Sediment Spatial Distribution, Page 20, Section 4.3.1.3, Subsurface Sediment Spatial Distribution, Page 23, and Section 4.3.2.3, Subsurface Sediment Spatial Distribution, Page 25:** There are several statements that discuss the areal distribution of contamination, but there are no figures to substantiate this information. The box plots cannot be used to substantiate statements about the areal distribution of contaminants, although they can be used to demonstrate the vertical distribution of contamination in the most general way. Please provide figures (i.e., postings maps or a series of bubble plots) that depict the areal distribution of contaminants in subsurface sediments for the analytes discussed in the text that were detected in more than one location.
29. **Section 4.3.2.1, Surface Sediment Spatial Distribution, Page 24:** The first paragraph asserts that the PAH concentrations appear to be declining over time at IR Site 24, but this assertion cannot be made without acknowledging that the older samples collected at Site 24 were closer to the source of contamination and that the 2005 sample locations were farther from the probable sources. Please acknowledge in the text that this apparent decrease over time could be associated with the distance between sampling locations and the outfalls and piers or delete the statement that PAH concentrations appear to be declining over time.
30. **Section 4.3.2.1, Surface Sediment Spatial Distribution, Page 24:** The last sentence at the end of the second paragraph implies that pesticide concentrations declined over time, based on elevated pesticide results from a 1996 data set as compared to the 1998 and 2005 data set, when the more recent data sets were not co-located with the 1996 data set. It is unclear how this statement is supported by the data presented. Please revise the text to further support the statement, or remove the statement from the RI Report.
31. **Section 4.3.2.2, Surface Sediment Temporal Distribution, Page 24:** The text states that “temporal patterns across years for Total PCBs and PAHs show a decline in concentration at IR Site 24,” but since samples were not collected from the same locations each year and the apparent decline may be spatially related to distance from the outfalls and piers, this conclusion is unsubstantiated. Most of the 2005 samples were not collected at the same distance from sources as samples collected in previous years. Please limit this temporal analysis to samples collected at the same distance from the outfalls and piers or delete this section.
32. **Section 4.3.3, Distribution of Radionuclides at IR Site 24, Page 25:** The conclusion that the distribution of Radium 226 (Ra-226) is not indicative of a release is not supported by the data, which indicate that the concentrations of Ra-226 were higher at depth. Since the deeper sediments would have been deposited when Ra-226 containing paint, dials, and devices were used at Alameda Point, it appears that the data may indicate that there was a release. However, since samples from only 3 locations near the outfalls were analyzed for radium, it may not be appropriate to draw conclusions based on this limited data set. Please delete the conclusion that the distribution of Ra-226 does “not appear to be indicative of a release associated with site activities.”

33. **Section 4.3.5, Summary of IR Site 24 Sediment Data, Page 26:** This summary primarily focuses on 2005 data, but since the 2005 data was generally not collected from the same locations as earlier data, the summary should include data collected in earlier sampling rounds. Please revise the text of this section to include a discussion of the data collected prior to 2005.
34. **Figure 4-8, Histograms Showing PAH Distributions and Concentrations for Three Urban Sediments Impacted by Urban Runoff and for IR Site 20:** For each of the different locations the y-axis has a different scale, which makes comparison of PAH concentration distributions between Site 20 and urban background difficult. Please use the same scale on the y-axis for all locations depicted on Figure 4-8.
35. **Table 4-9, Study of Organic Chemical Results for Surface Sediment at IR Site 24:** The maximum value reported for Radium 226 on the table is 0.32 pCi/g (picoCuries per gram), but the maximum value in Appendix A is actually listed at 0.43 pCi/g. Please reconcile this inconsistency.
36. **Section 5.1, Summary of Tissue Data, Page 27:** It is stated that tissue data were prepared for analysis according to Section 4.1.1, but Section 4.1.1 only contains information on how the tissue data points were processed. Specific details and procedures for tissue data preparation or collection were not included. Please provide the correct reference or expand the text to include this information.
37. **Section 5.1.1, IR Site 20 Tissue Data, Page 28:** The last paragraph of the section states, "Given that none of the organic constituents were detected in tissue, no attempt to compare values (DLs) to 90th percentiles was made," but it is unclear why this comparison was not made since the methodology had been approved by the Regulatory Agency and 4 samples is a very small data set. In addition, tissue chemical residues could be present below detection limits (DLs) and above comparison criteria for non-detect data. Therefore, DLs should be compared to the 90th percentile data. Please revise the RI Report to include a comparison of DLs with the 90th percentile data.
38. **Section 5.4, Sediment Exposure Point Concentrations, Page 30:** The text in the first paragraph of the section indicates that analytes that were never detected in sediment or tissue from any year were eliminated from further consideration, but this statement implies that data for chemicals where DLs were above benchmarks was not taken into considered by using one-half the detection limit of a chemical in this situation. Please clarify how chemicals with DLs above benchmarks were handled.
39. **Section 6.2.4.2, Selection of the Piscivorous Avian ROC, Page 41:** The second bullet of the section states that double-crested cormorants forage in shallow waters overlying substrates with flat relief, while the second paragraph on Page 42 appear to contradict that statement, indicating that double-crested cormorants will not forage in areas with "bottoms having no relief." Please resolve this discrepancy.

40. **Section 6.3.3, Screening-level Risk Estimate, Page 51:** Hazard quotient (HQ) results are examined in the RI Report by establishing a relative impact scale, with HQ results below 10 qualified as a low potential of risk for contaminant exposure to ecological receptors, values of less than 50 considered to be a measure of moderate risk, and HQ values over 50 considered a high potential risk, but justification or description of this scaling system does not appear to be present in the RI Report. Please revise the RI Report to remove the use of a qualitative scaling system, or provide a complete and clear technical rationale to justify this approach.
41. **Section 7.2.1.2, IR Site 24, Page 77:** It has been reported to EPA that people fish from these piers. Please evaluate the fish ingestion pathway for IR 24. Also, please include Ra226+D in this assessment.
42. **Section 7.3, Toxicity Assessment, Page 81-82:** Note as of March 2005, EPA's weight of evidence cancer classification are *Carcinogenic to Humans*, *Likely to be Carcinogenic to Humans*, *Suggestive Evidence of Carcinogenic Potential*, *Inadequate Information to assess Carcinogenic Potential*, and *Not likely to be Carcinogenic to Humans*. For more information, please visit <http://cfpub.epa.gov/ncea/raf>.
43. **Section 7.4.3, Risk Characterization Results, Page 84:** The risk characterization section must present and discuss the results of the quantitative evaluation, rather than simply referring the reader to a set of tables. Please include details about chemical drivers of risk, the location(s) of significant contamination and which pathways contribute most to the risk and hazard estimates. Also, this section must present additional discussion regarding the comparison of analytical results to reference concentrations. Please revise the risk characterization section of the RI Report to include additional discussion about the quantitative evaluation and the comparison of analytical data to reference concentrations.
44. **Section 9.1, IR Site 20, Page 97:** The text states that IR Site 20 "is defined as the 1,207-m portion of the Oakland Estuary adjacent to the former NAS Alameda, including areas offshore from Todd Shipyards," but only a small portion of the area offshore from Todd Shipyards is included in IR Site 20. Please resolve this discrepancy.
45. **Section 9.1.1, Nature and Extent of Sediment Contamination, Page 97:** The text concludes that "concentrations of most inorganic constituents and organic chemicals are relatively uniform across the site," but there are several areas with higher concentrations, based on the bubble plots in Appendix A. Please delete the quoted statement or revise it to clarify that there are areas with higher concentrations.
46. **Section 9.1.1, Nature and Extent of Sediment Contamination, Page 97:** It is unclear why the text only acknowledges that concentrations of mercury exceeded ER-M values when concentrations of antimony, chromium, lead, and zinc also exceeded ER-Ms. Further, the text states that pesticide concentrations do not exceed ER-Ms, but concentrations of 4,4-DDT (4,4'-dichlorodiphenyltrichloroethane) in surface sediment exceeded its ER-M. Since samples were collected from different locations during

different sampling events, it is not appropriate to focus only on the 2005 data set. Please revise the text to discuss all exceedences of ER-Ms.

47. **Section 9.2.1, Nature and Extent of Sediment Contamination, Page 98:** The text states that concentrations of analytes at locations other than in the northeast corner of the site are ‘lower and relatively uniform in distribution,’ but elevated concentrations of some analytes were detected in samples collected near Outfall L, which is located between Piers 2 and 3, and in the case of some PAHs, at a location south of Pier 2. Please revise the text to more accurately describe the locations of samples with elevated concentrations of analytes.
48. **Section 9.2.1, Nature and Extent of Sediment Contamination, Pages 98 and 99:** It is unclear why the text only states that nickel and silver concentrations exceeded ER-Ms when concentrations of cadmium, chromium, copper, and mercury also exceeded ER-Ms. Since samples were collected from different locations during different sampling events, it is not appropriate to focus only on the 2005 data set. Please revise the text to discuss all exceedences of ER-Ms.

In addition, the concentrations of PCBs were not relatively uniform in surface sediment; locations in the northeast corner had much higher concentrations of Aroclor 1254 and 1260 than other locations. Concentrations of certain PCB congeners were also elevated near Outfalls J and K. Please revise the text to more accurately describe the locations of samples with elevated concentrations of PCBs.