N60028_000612
TREASURE ISLAND
SSIC NO. 5090.3.A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

January 15, 1997

Ernesto M. Galang
EFA West - Code 1832.5EG
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, California 94066-2402

Re: Draft Remedial Investigation Report for Naval Station Treasure Island dated October 22, 1996

Dear Mr. Galang,

The U. S. Environmental Protection Agency (EPA) has received and reviewed the subject document. EPA's comments are enclosed.

If you have any questions, please call me at (415) 744-2383.

Sincerely,

Rachel D. Simons

Rachel D. Simons
Remedial Project Manager
Federal Facilities Cleanup Office

Enclosures

cc: Jim Sullivan, NAVSTA TI
Chein Kao, DTSC
Gina Kathuria, CRWQCB
Martha Walters, SFCHD
Sharon Tobias, PRC
File
Pat Nelson, RAB
Paul Hehn, RAB
Arc Ecology, RAB
Admin Record (3 copies)

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Draft Remedial Investigation (RI) Report for Naval Station Treasure Island dated October 22, 1996

General Comments:

1. Overall, the Draft RI Report is very thorough and well organized. EPA commends the Navy and PRC for their good work and successful coordination with EPA.

2. At sites where groundwater has been impacted, the risk assessment must identify groundwater as a medium of concern and the inhalation pathway must be evaluated. The results of the air sampling presented in Appendix I - Preliminary Evaluation of Air Sampling Data must be discussed in the text to evaluate the inhalation pathway.

3. Based on the detected concentrations of PCE, TCE and 1,2-DCE at IR Sites 21 and 24, it is likely that there is a DNAPL present. The DNAPL calculations should be conducted for both sites.

4. Plume maps should be provided for all groundwater COPCs. Also hydropunch results should be used to develop plume maps. This is particularly important for sites where there are more hydropunch CLP results than monitoring well results such as IR Sites 21 and 24. If the Navy is uncomfortable combining both hydropunch and monitoring well data sets, hydropunch plume maps can be developed separately from the monitoring well plume maps.

5. EPA understands that the groundwater modeling was not included in the Draft RI Report and will be included in the Draft Final RI Report. The following parameters, which are not presented in the Draft RI Report, are expected to be included in the modeling:

   1) Physicochemical Parameters: These parameters include migration, solubilization, and volatilization rates and retardation, adsorption, and partition coefficients. These parameters can influence migration and transport and should be presented using site specific measurements or calculations.

   2) Parameters for Metals:

   - Groundwater redox potential to determine oxidation state of contaminant metals to determine potential for adsorption, precipitation, or solubilization.

   - Cation exchange capacities to determine if site soils have adsorptive capacity for metals detected in soil and

groundwater.

- Measurements of humic and fulvic acid concentrations to determine if complexation of metals was possible.

6. The scales of the folded maps appear to be incorrect. Please verify the scales of these figures.

7. The calculations presented for the risk assessment concentration terms for the central tendency exposure (CTE) and the reasonable maximum exposure (RME) for data sets that are neither normal or lognormal is not acceptable and needs to be discussed with EPA.

8. The 1995 version of the Region IX PRGs was used to define nature and extent. Some of these values have been revised due to changes in toxicity values or new physicochemical information. No revision of the figures are necessary but this must be noted in the text.

9. The Summary Risk Tables in each chapter must reference the appropriate risk assessment tables located in Appendix G, Attachment G-3. For example, Table 9-8 Summary of Risks at Site 08 Associated with Residential Land Use and Soil Exposure Pathways should reference Tables G-3-23, G-3-24, and G-3-25.

10. The analytes and chemical family names are not consistently carried through the report. For example for IR Sites 07/10 in Section 8.6.1 Soil Sample Results (page 8-9), the chemical family names presented are SVOCs, chlorinated herbicides and TPH, but in Section 8.9.2 Nature and Extent of Chemicals of Concern in Soils (page 8-22), the chemical family names presented are PAHs, herbicides and TPH. Also in Table 18-1 Recommendations for IR Sites, Sites 07/10 identify the soil COCs as beryllium, PAHs, heptachlor and MCPP. Please revise the report to make it consistent.

Specific Comments:

1. Section 1.1.2 Federal Facilities Site Remediation Agreement, page 1-4

Although EPA is not a signatory to the FFSRA, please document EPA's involvement by discussing the BRAC Cleanup Team.

2. Section 2.2 Climate, page 2-1

Please provide references for the weather information (winds, temperature, precipitation, and humidity) cited in this section.

3. **Section 2.3.1 Regional Geology, page 2-3**

Please provide a regional geologic map with the report. The map should show the locations of geologic features discussed in section 2.3.1, including faults and lithologic units. Please indicate the project site on the map.

Sources must be cited for the information presented in this section.

4. **Section 2.3.2.1 Treasure Island Geology, page 2-4**

Please provide the ages for all of the units described in this section.

Please cite the appropriate cross-sections throughout the discussions of the units present at the site. All of the surface and subsurface units discussed in the text should be included on a cross-section. The Franciscan Complex should be indicated on Figures 2-2 and 2-3.

5. **Section 2.3.2.1.3 Older Bay Mud, page 2-5**

In the first paragraph, the use of "another interpretation" in this description of the Older Bay Mud unit is confusing. If there is evidence for the existence of Shoreline Deposits, provide a brief description of the Shoreline Deposits and the data indicating its existence. If there is no evidence of the existence for Shore Line Deposits then delete the reference.

6. **Section 2.3.2.1.4 Franciscan Assemblage, page 2-6**

In the first paragraph, the use of "another interpretation" is confusing and should be clarified. The ages and lithologies of the Shoreline Deposits should be discussed.

7. **Section 2.3.2.2 Yerba Buena Geology, page 2-6**

Please provide the ages for all of the units described in this section.

8. **Section 2.3.2.2.2 Colluvium/Eolian Sands, page 2-7**

Please include the "Dames and Moore 1949" reference in the reference section.

9. **Section 2.4.2 Yerba Buena Island, page 2-8**

Please provide a reference for the soil types discussed in the first paragraph of this section. Please also provide descriptions of Candlestick, Kron, and Beriberi soil types and a map showing the distribution of soil types.

10. Section 2.5.1.3 Treasure Island Tidal Influence, page 2-9

In the last sentence on this page, the mean groundwater gradients (0.0009 to 0.0016) listed are inconsistent with the statement in the first paragraph at the top of the page which state that the average gradients range from 0.002 to 0.003. Please explain this discrepancy.

11. Section 2.5.1.3 Treasure Island Tidal Influence, page 2-10

For purposes of comparison, please include the average salinity/total dissolved solids of bay water.

12. Section 2.5.2 Yerba Buena Island Hydrogeology, page 2-11

In the first paragraph, please replace the word "outcropped" in the fourth sentence with the words "was discharged" which more accurately describes the origin of the former springs.

13. Section 2.8.5 Threatened and Endangered Species, page 2-21

Threatened and Endangered Plants

Where was the dune gilia potentially observed in Yerba Buena Island? Please include the observed location on a figure.

14. Figure 2-6 Water Table Contour Map May 1995

The groundwater elevation at 24-MW04 does not match the groundwater contours. Please revise the figure or explain this discrepancy.

15. Section 3.2.1 Site Reconnaissance and Records Survey, page 3-3

Please reference the EPA document Aerial Photographic Analysis of Naval Station Treasure Island San Francisco Bay, California June 1995 which was used for scoping the RI workplan. The Navy should have a copy of this report.

16. Section 4.3 Potential Chemical-Specific ARARs, page 4-4

Are there applicable or relevant and appropriate requirements (ARARs) for industrial, process and agricultural water use?

IR SITE 01 - MEDICAL CLINIC

17. Section 5.1 Site Description and Operational History, page 5-1

The background information which is presented in the Site 01 -

Medical Clinic Additional Characterization Final Field Work Plan Addendum dated December 9, 1994 should be included in the text. The information provided in Section 2.2.1 Site 1 - Medical Clinic Description and Operations and Section 2.2.2 Previous Investigations would be particularly useful to include.

18. Section 5.1 Site Description and Operational History, page 5-1

Please include a description of the concrete slab in this section.

19. Section 5.2 Conceptual Model, page 5-1

IR Site 01 is not indicated on Figure 2-17 Site Conceptual Model. Please add this site to the figure.

20. Section 5.3 Geology and Hydrogeology, page 5-2

To be consistent with the other chapters, please include the number of borings and monitoring wells that were completed at IR Site 01. Please also include a summary description of the soils between 5 and 15 ft bgs.

21. Section 5.3 Geology and Hydrogeology, page 5-2

Please explain how the hydraulic gradient was calculated in the last paragraph and discuss whether this data was from the September or February water level measurements and whether the gradient changes seasonally.

22. Section 5.4 Analytical Results, page 5-3

Even though data from the PA/SI is discussed in the text and shown on Figure 5-2, the data should also be included in the tables.

23. Section 5.4.1 Soil Sample Results, page 5-3

Please correct the value for the ambient level of silver to 0.45 mg/kg.

24. Section 5.5 Source Control and Additional Characterization, page 5-4

Please show the area of excavated soil on Figure 5-2. Please also explain how the excavated soil was disposed.

25. Section 5.5 Source Control and Additional Characterization, page 5-4

Please reference the section of the Draft RI Report which

discusses the hazard index (HI) calculations presented in the third paragraph.

26. Section 5.6 Conclusions and Recommendations, page 5-5

The conclusion states in the third paragraph that "...no elevated silver concentrations remain at Site 01". This is not accurate since all areas exceeding silver ambient levels were not excavated. Please revise this statement to explain that silver concentrations remain at the site above ambient levels but that according to the risk assessment the contamination does not pose a risk.

IR SITE 03 - PCB EQUIPMENT STORAGE AREA

27. Section 6.3 Site Conceptual Model, page 6-2

As stated in the first paragraph, please include IR Site 03 on Figure 2-17 Site Conceptual Model.

28. Section 6.5 Geology and Hydrogeology, page 6-3

Please provide the distance from IR Site 03 to IR Sites 21 and 25 in the text.

IR SITE 05 - OLD BOILER PLANT

29. Section 7.1 Site Description and Operational History, page 7-1

The fuel pipeline on 5th Street should be identified on all figures for this section since it is a potential source of contamination.

30. Section 7.4.1.1 Phase I Remedial Investigation Approach and Section 7.4.1.2 Phase II Remedial Investigation Approach and Chapter 7 Figures

All three test pits are depicted as the same size on the figures while according to the text the length of the test pits varied from 18 to 38 feet. Please explain this discrepancy. Please also discuss whether the locations of the test pits are accurately shown on the figures.

31. Section 7.5.2 Hydrogeology, page 7-6

In the first paragraph, it is unclear what is meant by the statement "the groundwater characteristics at Site 24 will control the migration of contaminants from Site 05." Please clarify this sentence.

32. Section 7.9.3 Nature and Extent of Chemicals of Potential Concern in Groundwater, page 7-20

Please explain why PCE, TCE and 1,2-DCE are not considered COPCs in groundwater and provide a figure showing the COPCs for groundwater.

33. Section 7.10 Fate and Transport of Chemicals of Concern, page 7-21

The text states in the first paragraph that "Beryllium, lead, and mercury have a low volatilization rate,...low rate of biodegradation,..." With the exception of mercury, metals do not volatilize. Mercury, however, has a high volatilization rate. Metals do not biodegrade, and only lead has a tendency to sorb to soil. Please revise this sentence. These statements are also made in the Fate and Transport sections of Chapters 8, 11, 12, 13 and 14 and should be corrected.

IR SITE 07 - PESTICIDE STORAGE AREA AND IR SITE 10 - BUS PAINTING SHOP

34. Section 8.5 Field Geology and Hydrogeology Findings, page 8-7

Please provide the depth of the deepest boring at Sites 07 and 10.

35. Section 8.6.3. Catch Basin Sample Results, page 8-13

Besides this section, the catch basin sample results are not discussed in the text. If these catch basins are continually filled with contaminated soil, the soil must be evaluated as a source of contamination to the Bay. After the catch basins are cleaned out, how long does it take for the catch basins to accumulate soil? Please address these issues.

36. Section 8.9.3 Nature and Extent of Chemicals of Potential Concern in Groundwater, page 8-24

<u>TPH Extractables</u>

If monitoring well 14-MW03 mentioned in the third paragraph provides data relevant to the discussion, please include this well on Figure 8-3.

IR SITE 08 - ARMY POINT SLUDGE DISPOSAL AREA

37. Section 9.11 Conclusions and Recommendations, page 9-20

EPA can not concur on the "no action" conclusion for IR Site 8 until the risk is recalculated for the data set that is neither normal or lognormal distributed (See General Comment #7).

Since the concentrations of beryllium and lead generally decrease with depth, it has not been clearly demonstrated that these metals are not associated with sludge disposal practices. Although these metals do not pose an unacceptable risk, this statement should be revised.

IR SITE 11 - YBI LANDFILL

38. Section 11.5 Field Geology and Hydrogeology, page 11-8

According to Figure 11-1, boring 11-K is in the north-western part of the site, and is not on the southwestern boundary as described in this paragraph. Please resolve this discrepancy.

39. Section 11.5.3 Groundwater Flow Patterns and Velocity, page 11-10

Please indicate at what phase of the tidal cycle the May 1995 water levels were recorded.

40. Section 11.6.1 Soil Sample Results, page 11-13

<u>TPH-d</u>

It seems unlikely that USTs 204A and 204B are responsible for the widely dispersed TPH-d contamination at this site. Was the U.S. Coast Guard contacted for potential sources of TPH-d from their property? Please explain other potential sources on the site.

41. Section 11.6.2 Groundwater Sample Results, page 11-14

<u>Pesticides/PCBs</u>

Please move the phrase "at a maximum concentration of 0.15 μg/L" to the first sentence.

42. Section 11.9.2.1 Organic Chemicals of Concern in Soils, page 11-28

<u>SVOCs</u>

The text contradicts itself in that in the description of PAH contamination PAHs are described as concentrated in surface soil and also as having been detected mostly in subsurface soil.

43. Section 11.9.2.2 Inorganic Chemicals of Concern in Soil, page 11-29

Lead

Please note that the highest concentrations of lead were most often detected in intermediate depth (4 to 6 ft) samples.

Please also note that the highest detected concentrations of lead were found in samples collected at locations 11-TP02 and 11-TP03.

44. Section 11.11 Conclusions and Recommendations, page 11-33

If lead is most likely associated with painting operations and car emissions from the Bay Bridge, as stated in the text, explain why the highest detections of lead were in soil samples collected from intermediate depths (i.e., neither the surface nor the maximum depth). Normally, the highest concentrations of lead from these activities would be expected in surface soil.

45. Figures 11-11 through 11-14

Groundwater flow directions are not shown on these figures as indicated in the legends and text. Please add groundwater flow direction arrows to these figures.

46. Figure 11-3 Water Table Contour Map May 1995 and Figure 11-4 Water Table Contour Map November 1995

Since the tidal cycle can have a significant impact on groundwater levels and flow direction, indicate the time period during which groundwater levels were collected and the time of high and low tide for the day water levels were collected on these figures. This information would be useful for all sites impacted by tidal influence.

47. Figure 11-6 Inorganic Analytical Results for Soil

The detections of lead in the 4.00 and 6.00 ft samples from 11-TP03 should also be marked "R."

IR SITE 12 - OLD BUNKER AREA

48. Section 12.5 Field Geology and Hydrogeology, page 12-8

Please provide the number of borings completed at Site 12.

49. Section 12.5 Field Geology and Hydrogeology, page 12-9

The depth to groundwater range is incorrectly referred to as an "elevation range" in the first paragraph. Please correct. This depth range also contradicts the range given in the first paragraph on page 12-11. Please resolve this discrepancy.

50. Section 12.9.2 Nature and Extent of Chemicals of Concern in Soils, page 12-32

Dioxins

Please list all sample locations that were analyzed for dioxins. Dioxin results for 12-HP66 are missing from Figure 12-9. Please include these results on this figure.

51. Section 12.9.2 Nature and Extent of Chemicals of Concern in Soils, page 12-32

PAHs

Since PAHs are a COC, please include them on Figure 12-9. Also, the paragraph states that PAHs were detected at concentrations exceeding PRGs at 12-HP067, however, none of the data from this location is flagged on Figure 12-4.

52. Section 12.9.2 Nature and Extent of Chemicals of Concern in Soils, page 12-33

Metals

Please indicate the PRGs for antimony, arsenic, and lead.

53. Section 12.9.3 Nature and Extent of Chemicals of Potential Concern in Groundwater, page 12-36

Copper, Mercury, Nickel and TPH-d

Please reference Figure 21-10 in the discussion of TPH-d, Figure 12-11 in the discussion of copper, Figure 12-12 in the discussion of mercury and Figure 12-13 in the discussion of nickel.

54. Figure 12-9 Chemicals of Concern for Soil IR Site 12

TPH-g and TPH-m results are not shown on this figure for locations 12-HP066 and 12-HP067. TPH-m results are not shown on this figure for locations 12-HP072, 12-HP075, and 12-HP084. The text mentions these locations as having some of the highest concentrations the respective analytes detected, so these results should be added to the figure. Please check that no other data is missing from this figure.

IR SITE 17 - TANKS 103 AND 104

55. Section 13.1 Site Description and Operational History, page 13-1

Since the underground fuel pipelines are a potential source of

contamination, please show the pipelines on the figures for IR Site 17.

56. Section 13.5.2 Hydrogeology, page 13-6

In the first paragraph, it is unclear what is meant by the statement "the groundwater characteristics at Site 24 will control the migration of contaminants from Site 17." Please clarify this sentence.

57. Section 13.10 Fate and Transport of Chemicals of Concern, page 13-20

Since the entire site is paved as stated in the second paragraph, soil and groundwater would be expected to be oxygen deficient or anaerobic, particularly in the presence of oxidizable species such as hydrocarbons or iron (II). Degradation rates for TPH under anaerobic conditions are very slow and are not expected to be significant. Therefore, only a very slow source reduction would occur, especially if free phase or saturated soil were present.

58. Figure 13-2 Organic Analytical Results for Soil and Groundwater

The results from boring 17-HP001 are shown connected to boring 17-HP002. Please revise.

IR SITE 21 - VESSEL WASTE OIL RECOVERY AREA

59. Section 14.9.2 Nature and Extent of Chemicals of Potential Concern in Groundwater, page 14-18

Based on the methodology suggested in "Evaluation of the Likelihood of DNAPL Presence at NPL Site, EPA 540-R-93-073," there is a moderate probability that there is DNAPL present at this site in the vicinity of 21-MW02A/21-HP09 and 21-HP04. Please see Specific Comment #65 for more information about the method to evaluate the potential presence of DNAPL in multi-component situations.

60. Figure 14-6 through Figure 14-9 Concentration Maps

These figures should be modified or additional figures should be created using the hydropunch data to develop groundwater contours.

61. Section 14.10.2 Fate and Transport of Chemicals of Potential Concern in Groundwater, page 14-21

This section does not address specific chlorinated hydrocarbons,

1,2-DCE, TCE and PCE, which are described as primary contaminants in the conclusion. Please revise the text to address these specific compounds.

62. Section 14.11 Conclusions and Recommendations, page 14-21

The soil-gas and ambient air data collected for the Building 3 (Parcels T007, T008, T010, T014 and T116) Site-Specific Environmental Baseline Survey should be incorporated into this chapter to evaluate the inhalation exposure pathway.

IR SITE 24 - FIFTH STREET FUEL RELEASES AND DRY CLEANING FACILITY

63. Section 15.9.1 Evaluation of Adequacy of Data Collection, page 15-21

The detected concentrations of PCE and TCE from the shallow and intermediate depths of boring 24-HP001 indicate that there is a high probability that DNAPL is present in the subsurface. The detected concentrations suggest this boring is located downgradient of the DNAPL source area, indicating that the DNAPL is likely located under Building 99. This area under Building 99 would be the center of the solvent plume, so it is not correct to state that "the center of the solvent plume has migrated east of Building 99 near monitoring well 24-MW07."

64. Section 15.9.3 Nature and Extent of Contamination in Groundwater, page 15-23

<u>VOCs</u>

The text should include a discussion of the likely presence of DNAPL based on a calculation of the effective solubilities of the components of the plume and a comparison of Table 3-8 (see attached) from "Evaluation of the Likelihood of DNAPL Presence at NPL Sites."

65. Section 15.10.2 Fate and Transport of Chemicals of Potential Concern in Groundwater, page 15-24

Based on the detected concentrations of PCE, TCE and 1,2 DCE, it is highly likely that there is a DNAPL beneath Building 99. For a single component DNAPL, the environmental community generally accepts that a subsurface DNAPL is present at 1% of the compound's solubility. For a multi-component DNAPL, the solubilities of each component (effective solubilities) are depressed because of the effect of co-dissolution. To calculate the likelihood of DNAPL in a multi-component situation, the three DNAPL compounds found at the highest concentrations in groundwater should be used to calculate the percent solubility. The maximum percentage solubilities of the three components

should then be compared to the attached table. (Source: Evaluation of the Likelihood of DNAPL Presence at NPL Sites,m EPA 540-R-93-073, September 1993.)

Based on this method, in 24-HP001, PCE was detected at 16% of the solubility limit at the 9.5 to 11 ft interval. At 19 to 21 ft, PCE was detected at 19.3% of the solubility limit, and TCE at 2.8% of the solubility limit . According to Table 3-8, the likelihood for DNAPL presence in the subsurface is high. Based on the cross-section and dissolved concentrations of chlorinated solvents detected downgradient, a DNAPL is likely to be present underneath Building 99.

66. Section 15.10.2 Fate and Transport of Chemicals of Potential Concern in Groundwater, page 15-24

Vinyl chloride should be included in the discussion. This discussion should also be modified to include the high potential that DNAPL is present beneath Building 99.

67. Section 15.11 Conclusions and Recommendations, page 15-25

Please re-evaluate the last statement in the first paragraph in light of the high probability that DNAPL is present beneath Building 99. The presence of a DNAPL would suggest that concentrations would be greatest beneath Building 99, which in turn suggests that there may be a human health risk for future workers in Building 99 through the inhalation pathway. These results from Appendix I should be incorporated in this chapter to evaluate the inhalation exposure pathway.

68. Chapter 15 Figures

It is probable that the highest concentrations of PCE, TCE, and 1,2 DCE would be detected beneath Building 99. Figures 15-8, 15-9, 15-11, 15-12, 15-14, and 15-15 should be revised to show this. Also the results from the hydropunch sampling should be considered for developing the groundwater contours; this would result in a more accurate representation of the contaminant plumes.

IR SITE 28 - WEST SIDE ON- AND OFF-RAMPS

69. Table 16-1 Previous Investigation Results

The samples presented in Table 16-1 Previous Investigation Results - Site 28 should be indicated on a figure even if only general sample locations are available. Also, please explain why the maximum concentration for lead and zinc shown on Table 16-1 Concentration Terms for Soil COPCs are 8,700 mg/kg and 5,100 mg/kg respectively, but the Maximum Detected concentrations in

Table 16-6 are 1,120 mg/kg for lead and 1,380 mg/kg for zinc.

IR SITE 29 - EAST SIDE ON- AND OFF-RAMPS

70. Section 17.5 Field Geology and Hydrogeology, page 17-4 and Figure 17-1 Site Location Map

Please include the location of CalTrans boring 95-5 on Figure 17-1. This boring is referenced several times in the RI report, so it should be included on a figure.

APPENDIX E - QUALITY CONTROL SUMMARY REPORT

General Comment:

1. The review was based on the criteria outlined in the EPA documents "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," February 1994 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," February 1994, and on data validation guidelines established in Region 9. The PRC document "Quality Assurance Project Plan, Naval Station Treasure Island," Final, dated September 8, 1991 and the EPA document "Guidance for Data Quality Assessment" (EPA QA/G-9) were also used for reference.

   Overall, the conclusions presented in the Quality Control Summary Report (QCSR) are consistent with the criteria outlined in the methods, the Functional Guidelines, and Region 9 data validation procedures. However, clarification on a number of data validation issues should be provided. Concerns and comments identified in the review are presented below.

Concerns:

1. **[General]** Since the data quality objectives (DQOs) were not established in the QAPP, only the measurement objectives were addressed as part of the data quality assessment. The QCSR is a review of the data validation procedures only and no statistical data are provided specifying tolerable limits on decision errors.

2. **[General]** Unlike Region 9 data validation procedures, the QCSR neither defines nor includes criteria for the qualification of data as qualitatively questionable (N) for quality control (QC) failures. As a result, the QCSR presents a less complete assessment of data quality compared to Region 9 data validation procedures.

The "N" flag is used for tentatively identified compounds (TICs) in gas chromatogra0hy/mass spectrometry (GC/MS), coelution, on-column degradation of endrin and 4,4'-DDT, ion abundance outliers in GC/MS, and retention time (RT) outliers. It is not known whether any of the organic data generated in the remedial investigation (RI) required the use of the "N" flag.

3. **[Table E-4, Calibration Requirements; Table E-7, Accuracy Requirement; Table E-10, Analytical and Matrix Performance Requirements for Organic Analysis]** These tables do not include criteria for dioxins and furans.

4. **[Section 3.2.1, Cursory Review, Calibration, Organic Analyses; Table E-4, Calibration Requirements]** The QCSR specifies different calibration criteria for percent relative standard deviations (%RSD) and percent differences (%D) when estimating detected and nondetected results for all organic parameters. Section 3.2.1 should be expanded to address why %RSD and %D criteria differ when estimating detected and nondetected results, but the correlation coefficient (r^2) criteria do not.

5A. **[Section 3.4, Cursory Review, Accuracy; Table E-7, Accuracy Requirements; Table E-8, Data Qualification-Exceeded Accuracy Criteria]** It is unclear how Contract Laboratory Program (CLP) semivolatile surrogate recovery criteria are applied. Region 9 data validation procedures specify that the base/neutral and acid fractions be evaluated separately and results are not estimated unless two or more surrogate recoveries exceed the acceptance limits. Section 3.4 should be expanded to provide a clear explanation on how surrogate recovery criteria are applied. About one percent of the data points for semivolatile organic compounds was estimated due to surrogate recoveries outside the acceptance limits.

5B. It is unclear what the evaluation criterion "two or more surrogates" means in Table E-7 for CLP pesticides/PCBs. Since there are only two surrogates, does it mean two or more surrogate recovery results?

5C. Table E-7 does not include surrogate criteria for chlorinated herbicides. Since SW-846 Method 8150 specifies the use of the surrogate 2,4-dichlorophenylacetic acid (DCAA), the accuracy requirement for surrogate recovery should be included in Table E-7.

6A. **[Section 3.1, Cursory Review, Holding Times; Table E-2, Holding Time Requirements; Table E-3, Data Qualification-Exceeded Holding Time Criteria]** The QCSR specifies a criterion of two times the specified technical holding time

when rejecting nondetected results. Using Region 9 data validation procedures, the rejection of nondetected results for semivolatiles, pesticides/PCBs, chlorinated herbicides, and dioxins/furans when analytical holding times are exceeded may not be warranted. This is due to the stability of some of these compounds and because surrogate recovery can be evaluated to determine any adverse effect due to a missed holding time. One result for 4-nitroaniline was rejected due to missed holding time.

6B. Table E-2 should clearly indicate that the 7-day holding time for unpreserved water samples analyzed for CLP volatiles applies only to aromatic compounds.

7A. **[Section 3.2.1, Cursory Review, Calibration, Organic Analyses; Section 4.1, Full Review, Additional Analytical and Matrix; Table E-4, Calibration Requirements; Table E-10, Analytical and Matrix Performance Requirements for Organic Analysis]** It is unclear why Section 4.1 addresses the relative percent difference (RPD) between true and actual values for the CLP pesticides/PCBs calibration verification standard (i.e., performance evaluation mixture [PEM]), rather than in Section 3.2.1.

7B. It is unclear why Tables E-4 and E-10 both include the PEM RPD requirement since a data point would then be flagged with "J6" and "J7" for the same calibration outlier. This discrepancy should be resolved.

7C. The continuing calibration requirements for the PEM standard in Table E-4 should use RPD rather than %D for consistency with the method, Functional Guidelines, and the text of the QCSR.

8A. **[Section 3.2.2, Cursory Review, Calibration, Inorganic Analyses; Table E-4, Calibration Requirements]** The QCSR does not specify calibration criteria when rejecting data for CLP metals. The 1988 and 1994 Functional Guidelines and Region 9's data validation procedures specify (1) the rejection of nondetected results when the initial or continuing calibration verification (ICV/CCV) recovery for an ICP or GFAA analyte is less than 75 percent or less than 65 percent for mercury, and (2) the rejection of detected results when the ICV/CCV recovery for an ICP or GFAA analyte is greater than 125 percent or greater than 135 percent for mercury. This discrepancy should be addressed. It is not known if any metals data generated in the RI would require rejection using these criteria.

8B. The QCSR specifies acceptance limits of 80-120 percent recovery when estimating data for CLP metals except mercury in the ICV/CCV. The 1994 Functional Guidelines and Region 9

data validation procedures specify 90-110 percent recovery. The rationale for this difference should be provided. Two results for arsenic were estimated due to calibration outliers. It is not known if additional data would require qualification using these criteria.

9A. **[Section 3.6, Cursory Review, Analytical and Matrix Performance, Table E-10, Analytical and Matrix Performance Requirements for Organic Analysis]** The QCSR indicates that sample internal standard area counts must be within 50-150% of the associated calibration standard, whereas the Functional Guidelines indicate that internal standard area counts must not vary by more than a factor of two (i.e., 50-200%) from the associated calibration standard. The rationale for this difference should be provided.

9B. Although Section 3.6 includes internal standard retention time criteria, the associated Table E-10 did not include the criteria or the qualification action.

9C. Section 3.6 specifies the rejection of nondetected results for volatiles and semivolatiles when the internal standard areas are less than 10 percent of the associated calibration standard. However, Table E-10 specifies a criterion of less than 25 percent of the associated calibration standard. This discrepancy should be resolved. It is not known which criterion was used in the data validation process.

9D. The QCSR should clearly specify which data points are qualified when breakdown of endrin or 4,4'-DDT exceeds criteria since only six pesticide target analytes (i.e., endrin, endrin aldehyde, endrin ketone, 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE) are potentially affected by breakdown.

9E. The QCSR indicates that data are qualified when the sum of the individual endrin and 4,4'-DDT breakdown percentages exceeds 30 percent. Region 9 data validation procedures and the 1994 Functional Guidelines indicate that the degree of individual breakdown should be considered before qualifying any data. The rationale for qualifying data when the sum of the individual endrin and 4,4'-DDT breakdown percentages exceeds 30 percent should be provided.

9F. Section 3.6 is unclear what action is taken when detected results for pesticides/PCBs, chlorinated herbicides, and explosives are greater than the reporting limits and the RPD between results from two columns is greater than 100 percent. It is not clear from the discussion whether these detected results were "technically determined to be misidentified." In addition, the rationale for the application of the data qualifier "UJ7" to detected results originally less than the reporting limits is unclear in

terms of qualification of these data points as being quantitatively questionable. Section 3.6 should be expanded to address these issues.

Comments:

1A. **[General]** The methodologies, analytical parameters, and reporting limits specified in the QAPP are not consistent with those presented in the QCSR. In addition, the reporting limits presented in Table E-14 of the QCSR for volatiles, semivolatiles, pesticides/PCBs, and metals are not consistent with the contract required quantitation or detection limits provided in Exhibit C of the CLP Statement of Work. These inconsistencies do not appear to have affected the data generated and reviewed for this RI.

1B. Although the QAPP does not address, in any detail, provisions for data review, this deficiency does not appear to have affected the data generated and reviewed for this RI.

2A. **[Section 2.0, Validation Methodology]** The QCSR cites the January 1991a QAPP; however, the September 1991 QAPP was used for this review.

2B. The QCSR indicates that data were validated according to procedures outlined in the "National Functional Guidelines for Organic Data Review" (December 1990, [6/91 Revision]) and the "National Functional Guidelines for Inorganic Data Review" (October 1989, [7/88 Revision]). It should be noted that these documents have been replaced by the February 1994 Functional Guidelines.

2C. The QCSR cites the 1986 EPA document "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, Draft Supplement." This document has been replaced by "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations" (EPA QA/R-5), dated August 1994.

Questions or comments regarding comments on Appendix E should be referred to David R. Taylor, EPA QA Office, at (415) 744-1497.

APPENDIX H - STATISTICAL METHODS USED IN CALCULATING CONCENTRATION TERMS

1. Section 4.3 Other Data Distributions, page H-5

Please provide an example in the text of how the RME concentration term was calculated.

APPENDIX I - PRELIMINARY EVALUATION OF AIR SAMPLING DATA

1. Table I-1 Site 24 Emission Rate Calculations and Modeled Outdoor Concentrations

Please include SF Bay Area ambient air levels in Table I-1. Please also provide the detection limits for the not detected (nd) results.

APPENDIX J - ECOLOGICAL RISK ASSESSMENT METHODOLOGY AND RESULTS

1. Section 1.2.1 Deer Mouse, page J-7

Although the use of a low and high estimate for the various input data for the calculation of the dose seems logical, I'm not sure that the selection of a high and a low number from the data in Table J1-1 is the best estimate of these extremes. Why not use the average of all of the data at each extreme? What data from the literature were used to calculate the high and low? What habitat best reflects the habitat at YBI?

This comments also applies to the other receptors, the American Kestrel (Section 1.2.2) and the Peregrine Falcon (Section 1.2.3).

2. Section 1.2.4 Biomagnification Factors, page J-8

The literature referenced in Table J1-4 for the BMFs is in draft form (Research Triangle Institute, 1994), and uses questionable techniques (Baes and Others, 1984 and Travis and Arms, 1988). Estimates derived from these data should only be used in screening to classify the locations rather than eliminate the contaminates and locations from further consideration.

3. Section 1.3 Methodology for Low and High Dose Calculations, page J-8

The soil concentration appears to be input data with high uncertainty because it is held constant. Why were samples from 0.0 to 2.0 feet below ground used instead of surface samples from 0.0 to 0.5 feet? The geometric mean should be considered for use when the arithmetic mean cannot be calculated.

When estimating the concentration in plants that are considered food items of prey species, e.g., deer mouse, I understand that a single soil concentration was used. However, was the high and low BMFs for plants used to estimate a range of concentrations in plants?

4. Section 2.0 Ecological Effects Assessment: Toxicity Reference Values, page J-12

The last sentence in the second paragraph states, "The effects associated with the high TRV is clearly ecologically significant, so that..." This sentence should be revised as follows to better describe the implications of the high TRV, "The effects associated with the high TRV are clearly toxicologically significant with implied biological and/or ecological effects, so that..." Likewise, the material presented in Section 2.6 as rationale for TRVs should use the term ecological impact/significance with caution because most of the endpoints were toxicological in nature with the assumption that a biological/ecological impact would result, maybe a subtle, but a very important difference.

Note: Some of the referenced literature is not listed in the "References" section, global checks should be performed to ascertain that all cited literature is listed in the references section.

5. Section 3.0 Risk Characterization, pages J-81 to J-94

General Comment for All YBI Sites

The characterization of risk must include: 1) the nature and magnitude of risks; 2) the spatial and temporal patterns of risks; and 3) the implications for recovery (Wentsel et al, 1994; page 92). This section includes the magnitude of risks i.e., the hazard quotients, although, the presentation of impact estimates is based on predictions rather than measurements, resulting in a high level of uncertainty. The Navy has not provided adequate descriptions for the areal extent of impacts or risks. There are no presentations or discussion of the possibility of recovery of the significant impacts that are presented.

The summary statements in the risk assessment sections for all of the YBI sites do not recognize the significant estimates of risk as presented by the Navy; the Navy overstates the influence of uncertainty presented by the Navy data, and finally the Navy misinterprets the significance of their own estimates of impact and overall risk as presented. Because of the uncertainties resulting from the approach used by the Navy in this evaluation, the actual risk is unknown except for the contaminants that are shown at concentrations to pose a risk (Table J3-1). Although, the Navy is correct in stating that because of the high uncertainty in the results of this ERA, "definitive cause and effect statements" cannot be made, however, the quantitative evaluation shows that several contaminants pose a significant risk. The recommendation for these sites is for further work to better define the risk estimates by performing bioassays and sampling for specific receptors and pathways for the contaminants that are presented to result in significant risk. This further work is the validation step of the ERA.

6. **Section 3.1.1 COPCs with Hazard Quotients: Site 08, page J-82**

For a description of risk characterization, another bullet should be added to the three bullets listed on this page as follows: "Assess risk using bioassay testing with the soil from the site with the contaminant mixture that exposes the receptors directly to the soil and food items".

7. **Section 3.1.3 Summary of Risk at Site 08, page J-84**

For those sites that fall into Category 2, another possible decision that should be considered is the performance of bioassays to describe/determine the actual impact of the soil contaminants on the site receptors.

8. **Section 3.1.3 Summary of Risk at Site 08, page J-85**

As stated in the second paragraph on this page, how are "the limits of reasonableness" defined?

9. **Section 3.5 Data Limitations and Associated Sources of Uncertainty, page J-94**

The lack of data identified as limitations presented on this page are fundamental to the presentation of an adequate ecological risk assessment. When tasks are performed in a very focused effort to acquire these data, the results are far more productive and efficient for completing the ERA. Bioassays and sampling efforts that would accomplish this include:

1) Terrestrial vertebrate food chain - A more accurate and satisfying task is the direct sampling of deer mouse food and deer mouse tissue using co-located sampling of soil to relate the distribution of COCs across the site with the uptake in the biological resources. Direct sampling of the COCs that have been identified as "drivers" of the ERA would eliminate the uncertainty concerning the transfer of COCs from the soil to food items and then to the small mammals, which then serve as food items for the kestrel. (Note: The deer mouse is nocturnal while the kestrel is diurnal, perhaps another receptor is required to make the direct estimate of dose to the kestrel through this pathway.)

2) Bioassays of the contaminated soil - A more direct and accurate assessment of the potential impact of single and mixtures of COCs is through the use of bioassays that expose a test organism directly to the soil samples from the site. These bioassays should include plants, invertebrates and possibly small mammals and avian species when appropriate.

3) Specific sampling of media on the site to obtain the levels

of COCs that are important in the transfer of COCs through the biological systems pertinent to the site.

The limitations presented in this section are the particular result of the approach taken by the Navy i.e., modeling, rather than the result of the ERA in general. Other approaches i.e., bioassay methods provide direct results rather than predictions/estimates of impacts from COCs, thus reducing the uncertainties to acceptable levels. The fact that this effort is a "screening level ERA" (page J-94) demonstrates the limited use of the modeling approach and the necessity for the validation phase as recommended by the DTSC and EPA, Region 9.

10. Section 3.5.1 Uncertainty Analysis, page J-95

This section should discuss the limitations and potential effects of estimates for key data, BMFs, toxicity of COCs and interpretation of effects-data based entirely on modeling rather than direct sampling and measurement.

11. Section 3.7 Risk Characterization and Technical Conclusions, page J-100

The estimates of potential risks to TI receptors is based entirely on the hazard quotient approach that has been recognized as a very limited approach in theory and application. Early development (Urban and Cook 1986) states the limitations being related to the inability for the approach to account (or estimate) the impact on any biological organization higher than the individual and does not have any application for complex ecological relationships such as predator-prey relationships. The approach is also limited to single compounds i.e., COCs and has no reliable application for mixtures of COCs. The most serious limitation of the method is that it is principally based on the use of toxicological impacts that are most appropriately applied in a screening phase rather than a definitive phase, thus requiring a validation phase to confirm the predictions of the approach.

Because of the limitations inherent in the approach of the hazard quotient, more definitive data should be collected for the distribution of soil COC concentrations, plant and animal tissue levels that are most directly related to the soil environment.

For questions regarding the comments on Appendix J, please contact Clarence Callahan at (415) 744-2314.

APPENDIX L - PRINCIPLES OF CHEMICAL FATE AND TRANSPORT

1. Section 1.2.3 Hydrolysis, page L-6

The hydronium ion (H_3O^+) is generally only used in acid-base discussions; the reference here is actually to the hydrogen ion (H^+). Please revise.

2. Section 1.3.1 Biotransformation and Biodegradation, page L-6

The statement is made in the last sentence that aliphatic compounds have a higher propensity to biodegrade. Please specify which compounds are likely to biodegrade.

3. Section 2.1.1 Volatile Organic Compounds, page L-10

Aliphatic Chlorinated VOCs

A more thorough discussion of the degradation of aliphatic chlorinated compounds needs to be made (especially in regard to vinyl chloride). Vinyl chloride is very mobile, persistent, and has a low action level.

4. Section 2.1.1 Volatile Organic Compounds, page L-11

BTEX

The solubility of ethylbenzene is generally reported around 150 mg/L. Ethylbenzene is generally less soluble than the xylenes (except perhaps o-xylene).

5. Section 2.1.1 Volatile Organic Compounds, page L-11

BTEX

The heavier fuel components in fuel are generally more persistent than BTEX compounds. Benzene and toluene generally degrade fairly rapidly in an aerobic environment.

6. Section 2.1.4 Petroleum Hydrocarbons, page L-17

Has free product been observed on any of the IR Sites? If so, it should be stated.

7. Table L-2 Chemical Characteristics for Pesticides

Please list common names (DDE, DDD, and DDT) for compounds hat have them. Delta-BHC is listed twice (number 2 and number 11).

8. Table L-3 Chemicals of Concern for Semi-Volatile Organic Compounds

Dibenzofuran and 2-methylnaphthalene are PAHs and should be listed with the PAHs rather than the SVOCs.

Table 3-8. Contaminant Ranking Assignment, ranking of sites based on maximum percentage solubilities of DNAPL Compounds.

Ranking by Magnitude of Ground Water Contamination	Maximum Percentage Solubilities for DNAPL-related Compounds in Ground Water	Likelihood of Subsurface DNAPL
1	No DNAPL compounds or One DNAPL compound at < 0.1% or Two at < 0.03% or Three at < 0.01%	Low
2	One DNAPL compound at 0.1% to 1% or Two at 0.03% to 0.1% Three at 0.01% to 0.03%	Low
3	One DNAPL compound at 1% to 3% or Two at 0.3% to 1% or Three at 0.1% to 0.3%	Medium
4	One DNAPL compound at 3% to 10% or Two at 1% to 3% solubility or Three at 0.3 to 1% solubility	High
5	One DNAPL compound at 10% to 50% or Two at 3% to 15% solubility or Three at 1% to 5% solubility	High
6	One DNAPL compound at > 50% or Two at > 25% or Three at > 15%	Very High