



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street

San Francisco, CA 94105-3901

NO0217.003858  
HUNTERS POINT  
SSIC NO. 5090.3

January 21, 1997

Mr. Richard Powell  
Mail Code 09ER1  
Engineering Field Activities West  
900 Commodore Drive, Building B102  
San Bruno, CA 94066-2402

**SUBJECT: Parcel C Remedial Investigation Draft Report, Hunters Point Naval Shipyard, San Francisco, California**

Dear Mr. Powell:

The Environmental Protection Agency (EPA) has completed review of the subject document dated November 29, 1996. As you requested, we are forwarding comments by the January 27, 1997 date in order to maintain the current schedule for Parcel C. Overall, the document was concise and very well written. The Navy has done an excellent job of presenting an enormous amount of data in this document and has addressed a significant number of issues that were raised as part of the Parcel B and D document reviews, hence limiting the number of comments we have on this document.

We do have some general comments that we have discussed with you during previous meetings and anticipate that additional dialog will be necessary to determine the best approach for comment resolution. In addition, we have several comments that are included by section that are relatively straight forward and should not require extensive revision of the document.

Please feel free to contact me at (415) 744-2387 with any questions regarding these comments.

Sincerely,

A handwritten signature in cursive script that reads "Sheryl Lauth".

Sheryl Lauth  
Remedial Project Manager

cc: Michael McClelland, EFA West  
Cyrus Shabahari, DTSC  
Richard Hiett, RWQCB  
Amy Brownell, City and County of SF  
Glenna Clark, EFA West  
Christine Shirley, ARC Ecology

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**THE ENVIRONMENTAL PROTECTION AGENCY'S COMMENTS REGARDING  
THE DRAFT PARCEL C REMEDIAL INVESTIGATION REPORT,  
HUNTERS POINT NAVAL SHIPYARD**

**GENERAL COMMENTS**

1. Unique site features such as USTs, sumps, vats, dip tanks, and degreasers discussed in the text are not included on any figure. The location of these features and other potential sources should be included on one (or more) figure(s). These source areas should then be compared to observed contamination so that relationships between contamination and source areas can be evaluated.
2. Please update the information presented regarding the status of the exploratory excavation sites and the Dry Dock 4 sediment removal action.
3. Throughout the document reference to the Ecological Risk Assessment report is inconsistent (The discussion presented on Page 1-5 should be consistent throughout the document). The Phase 1B report does not include evaluation of the groundwater to bay pathway. This data gap should be addressed in the Draft Final RI report. While we acknowledge that the sediment data collected as part of Phase 1B report was not available for inclusion in the report, the Navy should have included results of the screening of groundwater data against NAWQC. It does appear that recommendations were made based on exceedence of NAWQC, however the evaluation seems to be missing from the site discussions.

Lastly, we suggest that an evaluation of near shoreline soil as a potential source to ecological receptors should also be included where a pathway exists. Some areas with the co-located metals associated with sandblast grit (and antifouling paints) are located close to San Francisco Bay. Since these metals are toxic to marine life, there is a potential ecological risk. Much of the shoreline has not been included in an investigation. The Phase 1B data should be used to evaluate the location of probable land-based sources, then, if there are implied sources that have not been investigated, these should be designated as data gaps.

4. Throughout the individual IR sections, the metals which exceed the HPALs are described as "could be assumed to be naturally occurring." This defeats the purpose of the HPALs and is acceptable only if supporting technical information is provided. If this supporting data is provided in this report, it should be referenced.

5. In many sections, the distribution of metals is described as sporadic or it is stated that "the distribution of these metals does not appear to be related to organic contaminants or to each other." It is also stated that there are no trends or discernible patterns. There is no evidence presented in the text that an analysis of metals associations or that an examination of the relationship between metals concentrations and source areas was done. There are patterns as shown be that ability to contour the metals data. There are metals associations that should be explored; for example, there are numerous locations where the historic antifouling paint additives (copper, mercury, and zinc) were detected in the same sample at elevated concentrations. In many of these samples, lead was also detected, which further supports the likelihood that sandblast grit was used as fill.
6. Groundwater plume maps should be included that show the presence of all the contamination (i.e. VOC contamination should be presented together rather than separately for each contaminant as is presented in the correlation discussions for each site (i.e. Page 4-50). This could be done with overlays showing the areas where groundwater exceeded screening criteria.

#### Table of Contents

1. Please list all figures and tables in the table of contents; for example, Figure ES-1, and tables ES-1 and ES-2 are not listed.

#### Executive Summary

1. **Figure ES-1.** Please define the term "data set boundary" as used in the legend of this figure. It is not clear whether the data set boundary is the same as the Parcel C boundary.
2. **History, p.ES-2, paragraph 1.** Please reference a figure indicating the locations of the features discussed in this section.
3. **ES-5.** Please clarify how the PRGs were used in the HHRA.

#### Section 1

1. **Section 1.2.1, pp. 1-3 and 1-4.** Several work plans, reports, and investigations are mentioned in this section, however, citations were not provided. Please cite and include in the bibliography the reports that contain the following information: Phase 1A and 1B ERA; OU work plan; PA, SI, SA, and RI work plans and reports; and the parcel wide RI report.

2. **Section 1.3, p.1-6, paragraph 1.** Clarify whether the 3.39-acre off-base right-of-way is part of parcel C which is evaluated in this RI.
3. **Section 1.3.3, p.1-12, paragraph 3.** Clarify that Figure 1.3-3 does not show facility wide utility sites, (sites IR-45, IR-49, IR-50, and IR-51). Reference the figure(s) in the RI report which indicate the location of these features/sites.
4. **Table 1.3-1.** Please clarify whether Building 203 (power plant substation H), is included in IR-29, IR-49 and/or IR-51. Table 1.3-1 indicates that this building is included in all three sites. Also, Building 205 is included in both IR-27 and IR-49 on this table. Please clarify which IR site(s) include Building 205.

## Section 2

### **SPECIFIC COMMENTS**

1. **Section 2.1.** References were not cited for several investigations, recommendations, or reports. Review this section and provide references for the IAS results and recommendations and the confirmation study verification and characterization results.
2. **Section 2.1.3, p. 2-3, first paragraph.** Please state whether any of the Triple A sites are within the Parcel C boundaries as this is not clear to the reader at this point in the text.
3. **Section 2.3.2, p. 2-1.** Excavations are described as proposed (future tense is used in the discussion), however, in Section 4 the excavations are described as having occurred. Please resolve this discrepancy and update the text as appropriate.
4. **Section 2.2.4, Page 2-10.** According to Appendix C, 25 wells were used during tidal studies at the site, rather than 41 wells, as stated in this section. Resolve this discrepancy.
5. **Section 2.3, p. 2-12.** the text does not mention the removal of 50 gallons of hydraulic fluid from Building 231 in August 1993, as stated on p. G-6 of Appendix G. Please correct this discrepancy.
6. **Table 2.3-1.** Several ASTs associated with Building 270 are listed under IR-29, however, Building 270 is located in IR-28. Please resolve this discrepancy.
7. **Section 2.4.2, p.2-16, paragraph 1.** A figure should be

included which indicates the location of the former and existing transformers at Parcel C to evaluate PCB contamination in soil. This figure should be referenced in this discussion.

### Section 3

#### SPECIFIC COMMENTS

1. **Figure 3.3-1, IR Sites and Sampling location map.** The legend of this figure indicates that former buildings are shown. However, it appears that only some of the former buildings are shown. The individual IR Site discussions reference this figure for locations of former buildings not indicated on the figure. Please revise the figure to indicate the former buildings, with labels, as discussed throughout the text, or provide separate figures with the former buildings.
2. **Section 3.2, p. 3-2.** The last sentence is incorrect. There are actually three dry docks in Parcel C (2, 3, and 4). Please revise. Please include Dry Dock 4 as a significant feature (or land use facility).
3. **Figure 3.4.1, Topographic and Geologic Map.** Please include a scale and a north arrow on this figure.

The explanation should include the geologic ages of the surficial deposits and the bedrock unit presented on the figure.

The geologic contact between KJs and KJc near IR-30 at Spear Avenue should not be open-ended. If the contact is queried, please use query marks.

4. **Figure 3.6-1.** Please enhance the parcel designations on this figure. The parcel delineation for Parcel C is not clear in the southern region of the parcel. Parcel F does not seem to be designated on the figure.
5. **Section 3.7, p. 3-6, paragraphs 3 and 4.** Please include IR-57, IR-64, and IR-27 in one of the two stratigraphic areas.
6. **Section 3.7, p. 3-7, paragraph 1, last two sentences.** These two sentences are somewhat contradictory and need to be revised. Please clarify the significance of the recovery of serpentinite bedrock from a depth of 146.5 feet bgs, and why the range of depth to weathered serpentinite is described as approximately 5 to 115 feet bgs in the second to last sentence. Was the recovery of serpentinite at 146.5 feet bgs part of the same geotechnical investigation? Please cite this investigation.

7. **Section 3.7, p.3-7, paragraph 2.** When discussing a direction, e.g., "moving toward Berth 2 from IR-58, a compass direction (e.g., east) should be used. In the fourth sentence, deposits such as the upper sands and bay mud, and undifferentiated sediments should be discussed as geologic units, not as space fillers (e.g., "the space between the deepening bedrock and the artificial fill"...). Geologic deposits should be described in an age sequence, which in turn should be included in the description (e.g., "from youngest to oldest").
8. **Section 3.8, p. 3-7, paragraph 2.** This paragraph references Figure 3.8-2, which is not included in this document. The conceptual groundwater flow model is an important figure and should be included in the main body of the report.
9. **Section 3.8, p. 3-8, paragraph 2 and p. 3-9, paragraphs 1 and 3.** It is not clear why the groundwater elevation measurements are included in the main body of the text since this information should be coupled with the associated groundwater elevation maps. These tables could easily be moved to Appendix C, however, the associated figures should be included in the main body of the text.
10. **Section 3.9, p. 3-10, paragraph 1, 3rd sentence.** This sentence does not make sense without an explanation. Normally, the elevation of the bedrock surface does not impact groundwater recharge from precipitation. It is more likely that the presence of pavement and buildings over most of the land surface is the primary limiting factor for the "freshwater recharge rate." Please explain the logic behind this sentence and revise it for clarity.
11. Table 3.8-2. Please explain why a groundwater depth is not included for the A aquifer (ex. IR-27).

#### Section 4

##### **GENERAL COMMENTS**

1. **Fate and Transport Tables.** The "Probable Source" in these tables is often incorrect. Errors generally fall into two categories: incorrect attributions (typically of metals and fuels) and missing attributions. The primary metals associated with unused petroleum or fuel oil are molybdenum, vanadium, nickel, and in the case of leaded gasoline, lead. Used motor oil primarily contains barium, lead, and zinc. Arsenic, copper, and mercury are not often found in fuels. Missing attributions include copper, mercury, and zinc from antifouling paints and sandblast grit; mercury from electronics (e.g., switches) and gauges, lead and antimony from batteries; and cadmium from electroplating,

photographic solutions, electrodes, scintillation counters, and paint pigment.

2. **Section 4.1.1.** The discussion of the spatial distribution of metals in soil is much improved over past RIs. One thing which is still missing is a discussion of metal associations, for example copper, zinc, and mercury were antifouling additives to paint, and are found in several areas in association with lead, which is commonly found in paint.

The following comments refer to all Parcel C sites.

3. **Sections 4.6.1, Potential Migration Routes.** It would be helpful to discuss chemical concentrations of site specific contaminants of concern along potential migration pathways at each site; e.g., surface soil → storm drain → sediment or soil → groundwater, etc. This would allow a clear indication if migration is occurring and give an estimate as to the role of adsorption and attenuation.
4. **Sections 4.6.1, Potential Migration Routes.** It is routinely stated that "*Organic contaminants in soil are expected to remain sorbed to soil and not migrate.*" Expand the discussion to provide specific information as to why contaminants are expected to remain sorbed to soil and not migrate. These sections could be made site and contaminant specific by calculation of maximum possible equilibrium groundwater concentrations of contaminants using organic carbon partition coefficients ( $K_{oc}$ ) tabulated in Appendix O and representative total organic carbon (TOC) concentrations for soil at each site.
5. **Sections 4.6.1, Potential Migration Routes.** It is routinely stated that:

"Metals in groundwater will equilibrate with the soil matrix through which the groundwater is moving. Metal solubility depends upon a complex series of reactions between groundwater and soil that is influenced by several factors, including pH and oxidation potential. The potential for metal migration in groundwater at site number is believed to be low."

Expand the discussion to provide specific information as to why the potential for groundwater migration is believed to be low. These sections could be made site and contaminant specific by geochemical speciation modelling using MINTEQ or another, similar model. A calculation of maximum possible

equilibrium groundwater concentrations of contaminants could be performed using representative literature values for inorganic soil-water partition coefficients ( $K_d$ ).

6. The tables presented throughout the text that give a summary of the exceedences is very helpful (i.e. Page 4-69). We would suggest that an additional column be added that presents a conclusion (i.e. included in the FS etc.) For example, where samples exceed the PRG but not the HGAL they may not require additional evaluation. Further, please indicate if the PRGs are residential or industrial.

## Section 4.2

### **SPECIFIC COMMENTS**

1. **Page 4-48.** Please evaluate whether the TCE and Vinyl Chloride contamination detected in the bedrock aquifer has been defined vertically. There appears to be a data gap regarding the correlation of affected groundwater in the bedrock water bearing zone and the A aquifer.
2. **Section 4.2, Page 4-62.** Please indicate which sample is being referenced as exceeding the NAWQC for mercury. There must be additional discussion regarding the impact to ecological receptors from groundwater entering the bay where NAWQC are exceeded.
3. **Section 4.2, p. 4-63, paragraph 2.** Please reference a figure which shows the locations of the two former USTs and the associated piping or waste oil discharged into the pump chamber in Building 205. If such a figure does not exist, please provide one. Since the potential sources identified with this site are attributed to these tanks, it is important to know their location in reference to the site, as well as Parcel C.

The reference to Figure 1.3-4 in the first sentence is incorrect. The location of IR-27 is not shown on that figure. The correct reference may be to Figure 1.3-2, the Facility Map.

4. **Section 4.2.1, p. 4-64.** A figure showing the locations of the two USTs should be referenced in this discussion.
5. **Section 4.2.3, p. 4-67, paragraph 3.** Please refer to the appropriate geologic cross-section(s) for IR-27. A general reference to Figures P.1-10 through P.1-16 is not appropriate for a site specific discussion of geology.
6. **Section 4.2.3, p.4-67, paragraph 4.** Please reference the

appropriate geotechnical borings and/or sampling borings upon which this discussion is based.

7. **Section 4.2.3, pp. 4-67 and 4-68.** If bedrock is encountered at shallow depths and groundwater was not encountered in artificial fill then the A-aquifer likely does not exist at IR-27. Please clarify that the only water bearing zone likely to be present at the site is in bedrock and why groundwater wells were not installed at this site.
8. **Section 4.2.7.2, p. 4-83, paragraph 6.** The lack of assessment of metals in groundwater migrating to the Bay needs to be identified as a data gap, both in this section and in the Data Gaps section.
9. **Section 4.2.8.2, p. 4-86, paragraph 2.** Please identify this lack of groundwater information as a data gap (see above comment).

### Section 4.3

#### SPECIFIC COMMENTS

1. **Section 4.3, pp. 4-95.** Please briefly state the results of the radiation survey conducted in 1989.
2. **Section 4.3.3, p. 4-137, paragraph 4.** The range of hydraulic conductivity is incorrect. The minimum was .093 ft/day, not .0095 ft/day.
3. **Section 4.3.3, p. 4-137, paragraph 5.** Please correct the typographical error in the first sentence. The text should read IR-28, not IR-29. **Figure 4-3-2, sheet 2 of 4.** This figure appears to be mislabeled as IR-29. Please correct this typographical error.
4. **Page 4-142.** Are the metals detected in the storm drain included as part of the storm drain removal action?
5. **Section 4.3.4.2, p. 4-147, paragraph 3.** Please give the reason that these soil samples were reassociated to other IR sites.
6. **Section 4.3.5.1, p. 4-171, paragraph 3.** The paragraphs following this do not include a discussion of potential sources as stated in the first sentence. Without a discussion of potential sources and whether observed contamination is related to these sources, the discussion of the nature and extent of contamination is incomplete.
7. **Section 4.3.5.1, pp. 4-171 through 4-174.** The discussion should consider metal associations to evaluate likely

sources of the elevated concentrations of metals. For example, beneath Building 211 in the vicinity of boring IR28B223, the association of elevated concentrations of copper, mercury, and zinc in association with elevated levels of lead strongly suggest that sandblast grit or dredge material containing antifouling paint additives was used as fill.

8. **Section 4.3.5.1, p. 4-175, paragraph 4.** Figure 4.3.3 does not show the extent of benzo(a)pyrene as stated in the text.
9. **Section 4.3.5.2, pp. 4-185 through 4-191.** A discussion of the vertical extent of VOC contamination, including the relationship between contamination found in the A-, B-, and bedrock aquifers is needed to complete this section.
10. **Section 4.3.5.2, p. 4-199, paragraph 4.** Please explain why it is believed that pyrene is present as a DNAPL. Pyrene would tend to sorb to soil, so if the grab sample from IR28B091 was not filtered, there is not likely to be a DNAPL. Further, unless there is evidence that pure pyrene was used in Building 231, the other PAHs (particularly phenanthrene and anthracene which have the highest concentrations of all the PAHs in petroleum), should also be present.
11. **Section 4.3.6.1, p. 4-205, paragraph 4.** It is stated that compounds in soil should remain sorbed to soil. Vinyl chloride and 1,1-DCE tend to be very mobile since they do not strongly sorb to soil.
12. **Section 4.3.6.3, p. 4-207, paragraph 1.** Include thallium in the list of metals that are somewhat mobile. Thallium behaves very much like sodium (+1 oxidation state predominates) and, thus, is relatively mobile.
13. **Section 4.3.6.3, p. 4-207, paragraph 2.** Vinyl chloride and other volatile compounds can also migrate into basements, vaults, and other enclosed areas.
14. **Section 4.3.6.3, pp. 4-208 through 4-210.** For metals and organics it is stated that there is a low potential for contaminants to be transported or that contaminants are expected to sorb to soil and remain in their present locations. These statements should be removed or qualified. Since contaminants are present in groundwater they have migrated from soil and are currently undergoing transport.

Please include transport to the Bay as a potential receptor.

15. **Table 4.3-28.** Please revise this table. Copper and mercury are not found in petroleum hydrocarbons, but vanadium is

found in unused petroleum products. Copper, mercury, and zinc were historic antifouling additives to paint; since these metals are found in association with each other at high concentrations in sandy samples, sandblast grit is the likely source of these analytes. Mercury was also used in gauges and electronic switches. Cadmium is used in electroplating, photographic solutions, electrodes, scintillation counters, and paint pigment.

#### Section 4.4

##### **SPECIFIC COMMENTS**

1. **Section 4.4, p. 4-236, paragraph 2.** Specify COPCs that are associated with paints, solvents, and photoengraving.
2. **Section 4.4.5.2, p. 4-288.** The presence of floating product in well IR29MW57A should be discussed in this section. It is not acceptable to mention floating product as the reason slug tests were not done in this well (p. 4-255) and then ignore this fact in the discussion of the nature and extent of contamination.
3. **Section 4.4.6.1, p. 4-292, paragraph 2.** Expand on why benzene is likely related to the forge and metal heating operations. Benzene is normally associated with gasoline or, in some cases, solvents for paints, coatings, finishes, etc.
4. **Section 4.4.6.1, p. 4-293, paragraph 1.** It is stated that the source of VOCs, SVOCs, pesticides, and PCBs in groundwater is unknown. If these analytes are present in both soil and groundwater at the same site migration and transport have obviously occurred. PCBs have been extensively used as cutting oils and heat quench liquids in the metal fabrication industry. Similarly, many SVOCs are commonly used as binders in foundry mold casting sand.
5. **Section 4.4.6.3, Migration in Groundwater.** The presence and persistence of floating product in IR29MW57A should be discussed in this section.
6. **Section 4.4.6.3, p. 4-297, PCBs.** These statements may be true in general, however, at this site Aroclor was detected in groundwater from a bedrock monitor well. PCBs are mobilized by solvents and petroleum products; evaluate the likelihood that PCB mobilization occurred at this site.
7. **Section 4.4.8.1, p. 4-308, Soil.** The primary metals associated with petroleum or fuel oil are molybdenum, vanadium, and nickel. Used motor oil contains primarily barium, lead, and zinc. Beryllium is used in aluminum

alloys to provide strength.

#### Section 4.5, IR-30

##### GENERAL COMMENT

1. The analytical results for sample IR30SU01 were not included in any of the tables in Volume III.

##### SPECIFIC COMMENTS

1. **Section 4.5, p. 4-317.** Please show the locations of the two large steel vats and two sumps on a figure. It is important to depict potential sources on a figure and then to evaluate whether contamination was detected near these potential sources. If these features are associated with samples (i.e., the floor vault samples) include this information in Section 4.5.2.1.
2. **Section 4.5.4.1, p. 4-325.** Please explain why the sump oil sample was not analyzed for PCBs. PCBs were commonly added to quench oils.
3. **Section 4.5.6.1, p. 4-338, paragraph 4.** PCBs were added to cutting and heat quench oils; this may explain the presence of Aroclor 1260.

#### Section 4.6, IR-45

##### SPECIFIC COMMENTS

1. **Section 4.6, p, 4-354, paragraph 3.** The steam lines are not clearly shown on Figure 1.3.3. There are small symbols labeled "steam lines," but it is not clear whether these symbols represent access points and if symbols were included for every steam line.
2. **Section 4.6, p.4-354, paragraph 3.** Please reference a figure indicating the locations of the areas used for transport of waste oils. Of particular importance is the section of steam line which was used to transport waste oils through Parcel C. This information may be presented on Figure 3.1-1, possibly as an overlay. This would enhance understanding the system and clarify which portions were believed to have transported waste oil through Parcel C.
3. **Section 4.6.8.1, p. 4-369, paragraph 3.** Three samples is not sufficient to establish the presence of benzo(a)pyrene as an "isolated occurrence" by any statistical means. Revise this paragraph.

## Section 4.7, IR-49

### SPECIFIC COMMENTS

1. **Section 4.7.5.1, p. 4-383, paragraph 4.** The last sentence is incorrect. The maximum mercury concentration was detected in a sample from test pit PA49TA09.
2. **Section 4.7.5.1, p. 4-386, paragraph 5.** Given that the samples for the IR-49 investigation were collected from locations that were spread out over most of Parcel C, it is inappropriate to conclude that metals results indicated "a sporadic distribution." There are patterns. The suite of metals (copper, mercury, zinc, and in the case of PA49TA01, lead) detected at high concentrations in test pits PA49TA01 and PA59TA02 strongly suggest that sandblast grit or contaminated dredge material was used as fill in these locations. Two or three of antifouling additives were also detected above screening criteria in several other samples.
3. **Section 4.7.5.2, p. 4-390, paragraph 7.** It is stated that "*The distribution of these metals does not appear to be related to a release of contaminants at IR-49.*" Expand the discussion to support this statement; e.g., include comparison to upgradient or regional groundwater metals concentrations.
4. **Section 4.7.8.1, p. 4-398, paragraph 3.** Provide a discussion comparing metal concentrations to site background or reference area concentrations to support the case that there has not been a metals release.
5. **Table 4.7-14.** It is likely that the probable sources of barium, vanadium, and zinc are petroleum spills and that the probable source of copper, mercury, zinc, and some of the lead detections is sandblast grit that was used as fill.

## Section 4.8, IR-50

### GENERAL COMMENTS

1. Please indicate the storm drain line number(s) on Figure 4.8-1 because they are referred to by number in the discussion. An example of this is the discussion of Drainage Area F, p. 4-402. The discussion refers to storm drain line 5, but this line is not shown on either Figure 4.8-1, or 3.1-1 (Parcel C Utility Lines).
2. Please be consistent in the order in which sample results are discussed. In Section 4.8.4.1, it is inconsistent whether storm drain water results are discussed first or whether storm drain sediment results are discussed first.

3. This removal action should be discussed. Segments of the storm drain that are in Parcel C and are included in this removal action should be specified.

#### Section 4.8, IR-50

##### SPECIFIC COMMENTS

1. **Section 4.8, p. 4-401, paragraph 4.** Table 4.8-1 does not include documented discharges from the known IR sites in Parcel C to each drainage area. This table contains the summary of field activities at IR-50. Please cite the table which provides information about the discharges from the known IR sites in Parcel C.
2. **Section 418k, p. 4-402, paragraphs 2 and 3.** The western portion of IR-57 is cited in discussions of both Drainage Areas F and I. Please explain or resolve this discrepancy.
3. **Figure 4.8-1.** Please label Berth 3, the discharge point for flows from Drainage Area 3 into the San Francisco Bay. Drainage Area G should also be labeled on this figure.
4. **Section 4.8.1, p.4-403, paragraph 1.** The reference to Table 4.8.1 appears to be incorrect. The potential source areas and the specific chemicals disposed of are not indicated on this table. Please reference the appropriate Table(s) or source(s).
5. **Section 4.8.5.1, p. 4-416.** Please discuss whether there are any patterns in the detected concentrations in sediment. Discuss whether concentrations increase between sampling locations in the same line. Also, please provide a map posting the sediment exceedences and also add the sampling station numbers to Figure 4.8-1. At present, the reader has no idea where the sediment stations were with respect to the storm drains or to other stations.
6. **Section 4.8.8.2, p. 4-424, paragraph 2.** There were no analytical results from groundwater samples, so this paragraph is incorrect. The storm drain sediment removal action to reduce the potential threat to San Francisco Bay should be mentioned in this section.

#### Section 4.9, IR-50

##### SPECIFIC COMMENTS

1. **Section 4.9.2.3, p. 4-429, paragraph 4.** Please correct the typographical error in the last sentence. The reference should be to Table 4.9.3.

2. **Section 4.9.5.2, p. 4-445, paragraph 4.** The presence of cadmium and zinc is likely related to site activities, so it is not appropriate to assume these metals are naturally occurring at concentrations above the HGALs.

#### Section 4.10, IR-51

##### **SPECIFIC COMMENTS**

1. **Section 4.10.1, p. 4-455, paragraph 3.** Please correct the typographical error in the second sentence. It appears that the correct table is Table 4.10-2, IR-51 Transformer Oil Samples. Also, please explain or correct the fourth sentence. It would appear that the maximum PCB content was 719,180 ppm in GH138, collected at Building 217, not Building 203.
2. **Section 4.10.2.2, p. 4-456, paragraph 3.** According to Table 4.10-4 there were only six soil borings. Please correct the text throughout this section (see p. 4-457, paragraph 3). Also, according to Table 4.10-5, 13 soil samples were collected from these borings. Table 4.10-4 shows five shallow and 10 deeper samples for a total of 15 samples. Please resolve this discrepancy.
3. **Section 4.10.4.2, p. 4-460, last table.** Either the units or the analytical results in this table are incorrect. According to Table 4.10-6, the maximum detection of Aroclor 1260 was 140 mg/kg, not 140,000 mg/kg. Please resolve this discrepancy.
4. **Section 4.10.5.1, p.4-462, paragraph 1.** Please correct the typographical error in the first sentence. The correct figure reference should be Figure 4.8-2.
5. **Section 4.10.6, p. 4-465, paragraph 1.** A TPH concentration of 180,000 mg/kg is equivalent to 18 % by weight. This would indicate there is free-phase petroleum in saturated soil and raises the distinct possibility of a LNAPL in groundwater beneath this location.
6. **Section 4.10.8.1, p. 4-470, last paragraph.** The sentence "In general, pesticide concentrations exceeding ..." should read PCB concentrations.

#### Section 4.11, IR-57

##### **GENERAL COMMENT**

The Dry Dock 4 Removal Action should be discussed in the Remedial Investigation and Recommendations section.

## SPECIFIC COMMENTS

1. Please explain why the borings were not completed on the north side of Dry Dock 4. This may be a data gap if examination of Phase 1B data indicates possible sources in the Dry Dock 4 area.
2. **Section 4.11.2.3, p.4-476, paragraph 2.** Even though this well was not sampled because it was dry, Figure 1.3-3 should be referenced to indicate the location of this well.
3. **Section 4.11.5.1, p. 4-488, first complete paragraph.** There are a number of misleading statements in this paragraph. There is at least one relationship between metals. The elevated copper, mercury, and zinc concentrations in the IR22B003 3.25 ft sample are indicative of sandblast grit. The presence of elevated lead in this sample confirms this. There are very few samples on the northern side of the dry dock, but the analytical results from test pit PA49TA02 (located in IR-57) are also indicative of sandblast grit.

The purpose of the HPALs was to establish a background level; this means that all detections above the HPALs are indicative of metals releases, whether or not the writer discerned a pattern. Further, the limited number of samples and the large area of IR-57 would make it appear that there is a "lack of apparent trends," when contamination may actually be widespread. Consequently, it is incorrect to state that "the metal concentrations detected at IR-57 do not indicate a release of metals to the environment." Revise this paragraph.

4. **Section 4.11.8.1, p. 4-498.** As noted in Comment 3, the historic antifouling paint additives were found at concentrations above the HPALs in at least two locations, so there are metals that are associated with each other. It is also incorrect to state that "the metals concentrations do not indicate a release of metals to the environment at IR-57," because all detections above the HPALs indicate a possible release to the environment. Revise this paragraph.
5. **Section 4.11.8.2, p. 4-501.** The risk to ecological receptors can be partially evaluated by examining the Phase 1B data. If there are elevated concentrations of analytes that are toxic to marine life in sediment samples collected from the Dry Dock 4 Area, then it is likely that a release has occurred. Note that groundwater is not the only possible source; contaminated sediments and water could also be released from the drainage culvert network.

The Dry Dock 4 Removal Action should be discussed in this section.

6. **Table 4.11-15.** Because elevated concentrations of copper, mercury, zinc, and lead were found in the same samples, the probable source for these metals is used sandblast grit.

#### Section 4.12, IR-58

##### **SPECIFIC COMMENTS**

1. **Section 4.12.5.1, p. 4-525, paragraph 2 and Section 4.12.8.1, p. 4-546, paragraph 2.** Elevated levels of copper, mercury, zinc, and lead were found in the 6.75 ft sample from boring IR58B011, suggesting that used sandblast grit may have been used as fill in this area.
2. **Table 4.12-22.** Because elevated concentrations of copper, lead, mercury, and zinc were detected in the same soil sample, the probable source is used sandblast grit.
3. **Section 4.12.5.2, p. 4-526, paragraph 1.** The distribution of constituents exceeding screening criteria in groundwater is shown on Figure 4.5-2, not 4.12-6. Please correct this error.

#### Section 5.0

##### **GENERAL COMMENT**

1. Please add a brief description of the former use and potential sources/source areas to each site summary. This will remind the reader of the significance of each site.

##### **SPECIFIC COMMENTS**

1. **Section 5.0, p. 5-2, last paragraph.** Please include the Dry Dock 4 Removal Action in this summary of removal actions.
2. **Section 5.1.9, p. 5-15, paragraph 2.** As stated in the specific comments on Section 5.11, there are metals associated with sandblast grit in soil samples, so it is incorrect to state that there is no relationship in the distribution of metals, and also incorrect to state that "the presence of sandblast grit does not appear to have resulted in elevated metal concentrations in soil." Revise this paragraph.
3. **Section 5.2.3.2, p. 5-24, table and Table 5.2.1.** As discussed in the specific comments on Section 4.3, it is extremely unlikely that pyrene, chrysene, and benzo(a)pyrene are present as DNAPL. These samples were not filtered, so it is more likely that these PAHs were sorbed to sediment rather than present as a NAPL. The fact that anthracene and phenanthrene, two compounds that are present at high

concentrations in petroleum products, were not detected at high concentrations in these samples strongly suggests that a PAH DNAPL is not present. Further, the detected concentrations in soil do not support the presence of a DNAPL.

Similarly, it is unlikely that Aroclor 1260 is present as a DNAPL. The presence of this compound is likely explained by either the presence of an oil phase or because Aroclor 1260 is sorbed to sediment. Soil results do not confirm the likelihood that Aroclor 1260 is present as a DNAPL.

4. **Section 5.3.1.** Please include a discussion of metal associations like lead-antimony and copper-mercury-zinc in this section.
5. **Section 5.4, p. 5-37, Boundary of Parcel C and San Francisco Bay.** The near-shore Phase 1B data should be analyzed to evaluate whether there are on-shore sources of contamination in Parcel C. If these sources are likely exist, this should be included as a data gap.
6. **Section 5.6.** The potential for metals transport to San Francisco Bay from IR-27, IR-28 and other areas of the shoreline should be included as a data gap.

#### APPENDIX C

1. **Section 2.3, p. C-10.** Based on the data collected during the tidal studies, it seems unlikely that rainfall infiltration, pumping, barometric pressures changes are very important relative to tidal induced pressure response in controlling water levels.

Please explain the basis for the statement: "All of the drains monitored showed direct to indirect correlation with tides." Describe an indirect response to tides in a storm drain.

2. Several of the slug test analyses were inaccurate. This occurred because the straight line was matched to the inflection point of the data curve rather than to the obvious straight line the data reveals. The following analyses should be redone:

- IR28MW273F
- IR28MW287A
- IR28MW299B
- IR29MW56F

No data was plotted for the slug test at IR58MW33B. Please include the data for this well.

## **Attachment A, Tidal Hydrographs**

1. EPA recommends that the format for the 1993 tidal study, including the tidal station hydrographs be used for all monitor well hydrographs.
2. Please discuss whether it rained during the May 1995 study. If so, this data should be provided.

## **APPENDIX G**

1. **Section 1.2, p. G-2.** The main text (p. 2-15, paragraph 2) states that "A total of 49 ASTs have been identified in Parcel C. Of these 49 tanks, 20 have been removed...", however in Section G1.2, the second sentence states that "no ASTs were identified as existing within Parcel C during these investigations." The second paragraph states that "none of the 13 ASTs removed have been associated with Parcel C. Resolve these discrepancies.

## **APPENDIX P**

1. References to the Bay Mud are not consistent. The term "Bay Mud" is used as a(n) (informal?) stratigraphic name, and appears as capitalized Bay Mud and lower case bay mud. The "Bay Mud Aquitard" is treated inconsistently as well.
2. The discussion of the regional and local bedrock structure appears to be quite thorough, but the relationship of the orientation of the bedrock structure (cleavage, joints, etc.) to site-specific groundwater flow in the bedrock is not discussed.

## **APPENDIX O**

1. Appendix O is an excellent general overview of fate and transport properties of contaminants present at the Hunters Point Shipyard.
2. Provide reference citations for all physio-chemical parameters listed in Table O-2.

## **Comments from EPA's toxicologist, Dr. Dan Stralka**

### **General Comment**

The text is clearly written and the screening levels were at the Region 9 PRGs. Contour maps clearly depicts the ambient level and the PRG. The final cumulative risk maps are consistent with previous agreements. The maps are useful

in focusing attention on areas of higher contamination and should help expedite remedial actions. One critical point in evaluating these maps is the uncertainty in the models calculating the indoor air contributions from the contaminated groundwater. This is most apparent in the areas where vinyl chloride has been detected. The assumed flow paths are straight up and this may not be the case since the gas will follow the path of least resistance and unfortunately this may be along the utility lines into the building and not straight up. The Navy should evaluate the flow paths and clarify if soil gas measurements were collected in this parcel that could be used to refine the indoor air modeling effort.

#### **Specific comments**

1. **Main text Section 4.1.1 page 4-12 Spatial distribution of arsenic in soil.** Please include a discussion of the non-cancer residential PRG of 22 ppm as a contour interval.
2. **Main text Section 4.0 page 4-3 Petroleum hydrocarbon screening criteria.** Be more explicit as to the rationale for choosing these levels. The 100 ppb level in groundwater is based on dilution and ecological effects. The soil levels are based on ecological, aesthetics, and protection of groundwater and based on the cited reports would be 100 ppm or less.
3. **Appendix N Section 3.2.4.1 page N-3-16 EPCs in Soil and Groundwater.** Please include a discussion of the different solubilities of  $\text{Cr}^{+3}$  and  $\text{Cr}^{+6}$  to support the assertion that chromium in groundwater would most likely be  $\text{Cr}^{+6}$ .
4. **Appendix N Section 1.0 page N-D-1 Chromium analysis of soil samples.** Please simplify bullet #1 and clarify the point.
5. **Appendix N Section 2.2 page N-D-3 Calculation of surrogate chromium VI fraction in soil.** Please discuss the operational histories of the two areas with  $\text{Cr}^{+6}$  detects that could have contributed to the  $\text{Cr}^{+6}$  level. Also, that the same percentage was used in parcel B.
6. **Appendix N Section 3.0 page N-D-3 Chromium analysis of groundwater samples.** Add the solubility discussion.
7. **Appendix N Page N-E-1 Indoor air concentrations.** Are there any soil gas measurements in parcel C available to reduce the number of modeling steps?