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18 Nov 1997

From: Commanding Officer, Engineering Field Activity, West, Naval Facilities Engineering Command

Subj: REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) FOR NAVAL STATION TREASURE ISLAND (NAVSTA TI)

Encl: (1) Navy Response to Restoration Advisory board (RAB) Comments on the Draft Remedial Investigation (RI) Report and Addenda

1. Enclosure (1) is provided for your information. The responses include a description of where, if appropriate, the comments are addressed in the draft final RI report. Comments were combined if they addressed similar issues.

2. Thank you for your guidance and involvement in this project. For further information, please call me at (650) 244-2560.

Original Signed by:

ERNESTO M. GALANG
By direction of
the Commanding Officer

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INTRODUCTION

RESPONSE TO RESTORATION ADVISORY BOARD COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT OF OCTOBER 1996 AND ADDENDA NAVAL STATION TREASURE ISLAND

These responses are presented in two sections; Response to Comments on the Draft RI Report, and Response to Comments on the Draft RI Addenda.

The responses address primary comments provided by Patricia Nelson, Paul Hehn, Karen Mendelow, and Dale Smith on the Treasure Island (NAVSTA TI) draft remedial investigation (RI) report; and by Patricia Nelson, Paul Hehn, Usha Vedagiri and John Allman on the Addenda.

Although there may still be differences of opinion regarding the Remedial Investigation Report, this is part of an ongoing dialogue that will continue through the Record of Decision on these sites in the Spring of 1999.

The Navy would like to request that any comments concerning this response package be included, verbal or written, in the responses to the Draft Final Remedial Investigation Report of September 1997.

A response to comments will be prepared for comments received at the close of the comment period for the Draft Final RI in December 1997. Similar responses will be prepared as required for the Feasibility Study and the Draft Record of Decision.

James B. Sullivan

Navy RAB Co-Chair

RESPONSE TO RESTORATION ADVISORY BOARD COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT OF OCTOBER 1996 NAVAL STATION TREASURE ISLAND

These responses address primary comments provided by Patricia Nelson, Paul Hehn, Karen Mendelow, and Dale Smith on Treasure Island (NAVSTA TI) draft remedial investigation (RI) report. Ms. Nelson and Mr. Hehn made a presentation on the report at the January 21, 1997, Restoration Advisory Board (RAB) meeting. At that meeting, three main areas of RAB concerns were identified: (1) incorporation of historical operations and data into the RI, (2) work plan implementation, including sampling and analytical procedures, and (3) data evaluation and presentation. Comments submitted by Ms. Nelson and Mr. Hehn have been summarized to reflect the 14 major categories of comments identified by the Navy at the February 18, 1997 RAB meeting.

A notation is provided at the start of each response to Ms. Nelson and Mr. Hehn's comments indicating whether changes were made to the draft final RI report of September 1997 to address the comment. The Navy's rationale for its approach to addressing the given comment follows each such notation. Additionally, citations indicating where comments are discussed in the draft final RI report are included. Such citations are not provided for comments that apply to the document as a whole, rather than discrete sections. Both the notations and citations are presented in *italics*. Responses to Ms. Mendelow's and Ms. Smith's comments were not presented in the preliminary response to comments submitted to the RAB in May 1997.

General Comments

1. **Comment:** **Insufficient Review of Historical Operations at Sites. Historical land use and building uses, in addition to the proposed reuses were not fully evaluated and considered as a basis for developing the phase IIB RI methodologies. For example, the RI focused on World War II era operations.**

Response: *For the reasons outlined below, no changes were made in the draft final RI report based on this comment.*

The RI focused on all past operations at the installation restoration (IR) sites, including site uses throughout its existence, not only operations during WWII. The Navy completed its basewide environmental baseline survey (EBS) at NAVSTA TI in May 1995. The purpose of the basewide EBS was to conduct a complete review of the Navy's documentation to obtain a history of the base and to identify any past and present conditions for each parcel of the installation, what the buildings were used for, parcels where chemicals may have been stored, and identify any data gaps. The EBS involved a review of land and building records, engineering construction drawings, and aerial photographs. The Navy's contractors for the EBS and the Installation Restoration Program (IRP) worked very closely to ensure that new information identified

by the EBS was included in the IRP. For example, during the review of documents for the EBS, a construction drawing and an aerial photograph were discovered that showed the former locations of some aboveground storage tanks at IR Site 15; this information was incorporated into the approach for the RI. Another example was the review of the aerial photographs which identified areas for further sampling at IR Site 12. All available information was considered during the development of the phase IIB RI work plan addendum. The Navy considers the basewide EBS to be a complete review of the historical operations and land use of NAVSTA TI. The information was made available to and was used by the Navy's contractor for the IRP (Tetra Tech EM Inc. [Tt EMI], formerly PRC Environmental Management, Inc. [PRC]) during the work plan development.

Regarding future reuses, the City of San Francisco had not identified any potential reuse alternatives before sampling had begun. The only information available to the Navy throughout the time of the sampling was that the existing conditions of NAVSTA TI indicated that residential reuse on TI would likely would not be considered. No other information was available during the work plan preparation phase.

The Navy based the selection of chemical analyses on historical operations, prior environmental investigation activities, and known sources at each site.

2. **Comment:** **Incorporation of Historical, PA/SI, Phase I and Phase II data into the RI report. It is unclear how the data from the preliminary assessment/site inspection (PA/SI), phase I, and phase IIA RI were incorporated into the RI report.**

Response: *For the reasons outlined below, no changes were made in the draft final RI report. The following response clarifies which data were presented in the draft RI report. Citations of specific tables and sections are also provided.*

The draft RI report summarizes all analytical results generated under the phase I and II RIs. The PA/SI data and phase I RI data were used to develop the work plans for both the phase IIA and IIB sampling plans. The PA/SI, phase I, and phase IIA results were incorporated into the RI report and are included in the text (for the PA/SI data) and in the figures and data summary tables for phases I and II. All chemical analytical data from each phase is presented together for a complete picture.

Examples of RI sections where data from previous investigations can be found:

- *For Site 08, the PA/SI data are summarized in the text in Section 9.2. The phase I and IIB data are discussed in Section 9.6, and presented in Table 9-3 and Figures 9-2, 9-3, and 9-4. Other sites follow a similar format.*

- *For Site 09, Section 10.4 discusses the types of samples collected. Tables 10-1, 10-2, and 10-3 present which soil, groundwater, and oil samples were analyzed for which constituents. Section 10.6 discusses the results of all the RI samples collected (as described in Section 10.4).*

- *Other site information is presented in a similar format.*

3. **Comment:** **Biased Sampling. Biased sampling limited the RI evaluation and relationship between the underground storage tank and IR sites.**

Response: *No information was added to the draft final RI report, since the phase IIB work plan addendum and the draft RI considered these issues, as explained below.*

Sampling was planned for all the IR sites after considering investigative areas and potential sources at adjacent IR sites. For example, investigative area AA consisted of Sites 12 and 20; BB of Sites 07/10, 14, and 22; CC of Sites 04/19, 05, 17, and 24; and DD of Sites 9 and 25. After the sampling was completed, the nine petroleum-only sites were transferred out of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program. The Navy reviewed the data to determine that adjacent CERCLA sites were not impacted by these sites and that the CERCLA substances were not impacting the petroleum-only sites.

If the underground storage tank (UST) sites to which the comment refers are the UST sites that were never part of the IRP, these UST sites have little potential impacts on IR sites. The UST sites are not located near any IR sites. The only exception to this is UST 270 which is adjacent to IR Site 11 (Yerba Buena Island [YBI] Landfill). The Navy recognizes that this UST and IR site should be evaluated together in the future.

With respect to biased sampling, further sampling planned at Site 12 will involve nonbiased, grid sampling.

4. **Comment:** **Immunoassay Testing Techniques. (A) Results of comparison test for Millipore BTEX analysis were not presented to RAB. (B) High rate of false positives and false negatives using immunoassay testing raises questions of data validity. (C) Sensitivity of immunoassays is inadequate. (D) No summary of where immunoassays were used and how many samples were analyzed. (E) No comparison of immunoassay results to laboratory results presented on the maps.**

Response: *For the reasons outlined below, no additional information was added to the draft final RI report based on this comment.*

A. While the benzene, toluene, ethylbenzene, and xylene (BTEX) immunoassay test (Millipore) was not used at any of the CERCLA sites presented in the draft RI report, the test was used to analyze samples collected at petroleum sites, which will be discussed in the corrective action plan (CAP). The Millipore BTEX immunoassays were used at Sites 20 and 25. The comparisons show solid agreement between the immunoassay data and the laboratory data. Also, a general agreement between the total petroleum hydrocarbons (TPH) and BTEX test results was observed in the samples analyzed. The comparison will be provided to the RAB in the draft CAP, expected to be available in November 1997.

B. The purpose of the field screening technique used at NAVSTA TI was to provide a quick, approximate measure of the amount of petroleum contamination in soil and groundwater. The information collected can also be used in evaluating the lateral and vertical extent of contamination. In this respect, the performance of the immunoassay tests was acceptable. Areas of petroleum contamination were correctly identified and delineated using a combination of immunoassay and laboratory results.

The goal of the immunoassay tests was not to match laboratory results, sample by sample. While it is useful to judge the performance of the immunoassay test by evaluating the number of false negative and false positive results, it is more important to keep the primary goal of identifying petroleum contamination in mind. The number of false positives and false negatives are summarized by site in Table 1. The performance of the immunoassay tests was acceptable at most sites. Matching and false positive results are considered acceptable for determining the extent of contamination. False positives are conservative errors that do not affect the data interpretation and are more desirable than false negatives.

The cause of the false negatives in the soil samples at Site 12 is suspected to be the large concentrations of motor oil detected in the soil. While motor oil was also detected in the soil at other sites, the same increase in false negatives was not observed, possibly because of a different composition of the oil. Additional samples are being collected to further characterize Site 12.

TABLE 1

COMPARISON OF TPH AND PAH IMMUNOASSAY RESULTS

Site	Analysis	Soil Samples				Groundwater Samples			
		Comparison Samples	Match	False Positive	False Negative	Comparison Samples	Match	False Positive	False Negative
05	TPH	9	4	0	5	5	3	1	1
07/10	TPH	9	8	1	0	4	4	0	0
	PAH	9	9	0	0	NA			
09	TPH	1	0	0	1	4	4	0	0
	PAH	1	1	0	0	NA			
	PCB	2	1	1	0	NA			
11	TPH	16	9	4	3	NA			
	PAH	13	8	3	2	NA			
12	TPH	42	23	2	17	32	24	8	0
17	TPH	5	3	0	2	1	1	0	0
Total	TPH	82	47	7	28	46	36	9	1
			66 %		34 %		98 %		2 %
	PAH	23	18	3	2	NA			
			91 %		9 %				
	PCB	2	1	1	0	NA			
			100 %		0 %				

Notes:

NA not applicable

TPH total petroleum hydrocarbons

PAH polynuclear aromatic hydrocarbons

PCB polychlorinated biphenyls

C. The immunoassay test is sufficiently sensitive. The detection limits of the immunoassay test for TPH are 15 milligrams per kilogram (mg/kg) for soil samples and 0.25 milligram per liter (mg/L) for water samples. These detection limits are much lower than the TPH screening levels developed to be protective of ecological receptors (RI addendum no. 3): 430 mg/kg for soil samples and 14.3 mg/L for water samples.

D. The draft RI report summarizes how many samples were analyzed using the immunoassay tests. The following table (Table 2) shows which CERCLA sites used immunoassays during the phase IIB RI.

TABLE 2

SUMMARY OF IMMUNOASSAY ANALYSIS BY SITE

Site	Number of soil and groundwater samples analyzed by immunoassay	Immunoassay analyses performed
01	None	
03	None	
05	42 soil 16 water	TPH TPH
07/10	30 soil 16 water	TPH, PAH TPH
08	None	
09	5 soil 5 water	TPH, PAH, PCB TPH
11	42 soil 0 water	TPH, PAH
12	149 soil 105 water	TPH TPH
17	22 soil 7 water	TPH TPH
21	None	
24	None	
28	None	
29	None	
Total	290 soil 149 water	TPH, PAH, PCB TPH

E. The maps do not present all sampling data for each site; rather, they present only what the Navy considered to be the most accurate TPH results. When the laboratory and field screening results did not match for the TPH analysis, the laboratory results were presented on the map. The results for TPH as motor oil were also presented on the maps.

A comparison of immunoassays results to laboratory results are presented in tables for each site in the draft final RI report; for example, for Site 09, the comparison is made on Table 10-4.

Table 10-1 in the draft final RI report presents which soil samples were analyzed be immunoassay for IM-PAH, IM-PCB, and IM-TPH. The total number of analyses is included at the bottom of the last page of Table 10-1.

5. **Comment:** **Tidal Fluctuations. Only 11 monitoring wells were used in the tidal influence study and not all sites were included. Additionally, the effects of tidal influence on distribution and dispersion of contaminants needs to be addressed.**

Response: *No additional data evaluation was performed for the draft final RI report as explained below.*

The tidal influence study, conducted August 1 through 4, 1995, monitored tidal fluctuations in 11 wells on Treasure Island (TI) and 3 wells on YBI. It also included a monitoring station in the bay, near Clipper Cove. Sixteen wells were to be monitored; however, due to data logger or transducer problems, data from two of the wells were unusable or incomplete.

The following criteria were used to select wells for the tidal influence study: proximity to the bay, fluctuation in groundwater levels and hydraulic gradients, placement of an adequate number of wells for calculating the groundwater gradient in critical areas where significant tidal influence is indicated, and inclusion of at least one well per site,

The only site that did not have at least one well included in the August 1995 study was Site 20. This site is about 500 feet inland. None of the Site 12 wells west of Site 20 (12-MW05 through 12-MW10) had been installed as of August 1995. As for Sites 07/10, 09, and 21, wells were installed at these sites during the phase IIB RI. The fact that these wells were not included in the tidal influence study does not constitute a data gap, since the hydrogeology at these sites is similar to other sites throughout NAVSTA TI. As a result, the information generated during the tidal influence study should be sufficient to apply to these other sites. Site 07/10 is adjacent to Sites 14 and 22, and Sites 09 and 21 are near Site 25. Therefore, no additional data were deemed necessary for the draft final RI report.

It is important to note that tidal fluctuations increase vertical dispersion in contaminant plumes near the shoreline (and therefore reduce concentrations in groundwater discharged to the bay). In addition, contaminant concentrations in groundwater tend to decrease in the tidally influenced zone due to mixing of groundwater with bay water (dilution). As a result, contamination detected in the groundwater at the sites would likely attenuate by the time it reaches the shoreline.

6. **Comment:** **Interaction/Migration of Contaminants Between Sites. No analysis of potential contaminant migration between adjoining sites (CERCLA or UST sites). For example, Site 12 - Old Bunker Area and Site 06 - Fire Training School.**

Response: *No additional data evaluation was performed for the draft final RI report. The response describes the specific sites where the migration of contaminants between sites is of concern and identifies the associated wells installed to address possible migration.*

The potential migration between sites was evaluated. Sites adjacent to each other are 05 and 17, 06 and 12, 12 and 20, 10 and 14, and 04/19 and 24.

At Site 05, chlorinated solvents were identified in the groundwater during the phase IIB RI. The phase IIB RI sampling at Site 17 did not include analysis for volatile organic compounds (VOC)., As a result, additional sampling at Site 17 was conducted to define the extent of chlorinated solvent groundwater contamination that might have migrated from Site 05. The results are discussed in the "Draft Remedial Investigation Report Addendum No. 2 Additional Characterization at Sites 12 and 17," dated April 15, 1997.

The groundwater characterization results for Sites 05 and 17 are discussed in Sections 7.6.2 and 13.6.2 of the draft final RI report. The discussion in Section 13.6.2 focuses on the additional characterization of Site 17, which was initiated because of the detection of VOCs at location 05-HP05, on Site 05. The investigation targeted Site 17 because Site 17 is hydraulically downgradient of Site 05 and because VOC samples collected upgradient of 05-HP05 showed decreasing concentrations of VOCs; therefore, it was assumed that the VOC contaminants had migrated downgradient to Site 17.

Monitoring wells were installed on the borders between Sites 06 and 12. Contaminant migration, if any, will be monitored using these wells between the sites. If migration occurs, the Navy will be prepared to evaluate it and respond. Groundwater contamination at Site 06 has been extensively investigated with a total of 20 monitoring wells installed. Groundwater at the site flows north to the bay and not in the direction of Site 12. In addition, several groundwater samples were collected by hydraulic punch just east of the Site 12 boundary and just north of the Site 06 boundary, as part of the Site 12 investigation.

The locations and sampling results of monitoring wells and hydraulic punch groundwater samples for Site 12 are presented on Figures 12-6, 12-7a, and 12-7b and discussed in Section 12.6.2 of the draft final

RI report. The same information for Site 06 is presented in Section 3.2 of the draft corrective action plan (CAP).

The results from the Site 06 monitoring wells indicate that, at this time, there is no migration of contaminants between Sites 06 and 12.

Site 20 is located just east of the western portion of Site 12. The Site 12 water table contour map in the RI report (Figure 12-3) includes data from the Site 20 monitoring wells. The map shows that Site 20 is upgradient of this portion of Site 12. Figure 12-10 (TPH-diesel concentration map) includes data from Site 20 monitoring wells 20-MW02 through 20-MW05. Well 20-MW04 is just inside the Site 12 boundary. The wells are located where contaminant migration, if it occurs, can be monitored and evaluated.

As for Sites 10 and 14, monitoring well 14-MW03 was placed at Site 10 and will be used to monitor migration between the sites. However, since neither site is downgradient from the other, the migration potential is expected to be minimal and no explicit discussion of the potential contaminant migration is included in the RI report. *The hydrogeology of Site 10 is discussed in Section 8.5 of the draft final RI report. The results for groundwater samples collected from monitoring well 14-MW03 are presented on Figure 8-2 of the draft final RI report.*

For Sites 04/19 and 24, Site 04/19 is downgradient and south of Site 24 which has contamination at greater depths. The contamination at either of these two sites is not expected to affect the other site and no explicit discussion of the potential contaminant migration is included in the draft final RI report. *The hydrogeology of Site 24 is discussed in Section 15.5 of the draft final RI report. The results for groundwater samples collected from hydraulic punch locations and monitoring wells at Site 24 are presented in Section 15.6.2 of the draft final RI report and the draft Site 24 Additional Characterization Summary Report (October 1997). The sampling results for Site 04/19 are discussed in Section 3.1 of the draft CAP.*

7. **Comment:** **Total Petroleum Hydrocarbons (TPH) Sites. This comment includes the following: (A) sites with TPH contamination were incorrectly identified for no action - rationale unclear; (B) how sites were transferred from CERCLA to UST program is not explained, and sites transferred to UST program used immunoassay and geoprobe sampling techniques; (C) migration of TPH contamination from UST sites to CERCLA sites was not evaluated.**

Response: *This response provides clarification of the approach used in the RI. No changes were made to the draft final RI report based on this comment.*

A. The draft RI recommended no action for soils at Sites 05 and 17; however, this was in the context of non-petroleum substances. The draft RI recommended that the nature and extent of petroleum hydrocarbon contamination be investigated during the removal of the fuel lines at these sites. The conclusions and recommendations sections for Sites 05 and 17 in the draft final RI (Sections 7.11 and 13.11 respectively), include similar recommendations but make clear that the no action recommendation refers only to the CERCLA regulatory framework.

B. Sites were transferred from the CERCLA program to the UST program following a thorough evaluation of the phase I and II laboratory analytical data and the site histories. The chemicals at each site were evaluated to determine whether TPH contamination was commingled with any CERCLA hazardous substances. The decision to transfer a site to the UST program was made only if CERCLA hazardous substances were not consistently detected in the soil or groundwater. The historical operations at the site were also reviewed to determine that the suspected sources were only related to petroleum products. The Navy and the regulatory agencies evaluated the data and made a joint decision regarding the transfer of these sites to the UST program.

The decision to transfer nine sites to the UST program was based on all laboratory analytical and historical data available for those sites. The immunoassay data were not considered. Since there were analytical data for these sites from the phase I, IIA, and IIB RIs, as well as the PA/SI, and the sources and historical operations were known, the Navy determined that there were sufficient analytical and historical data to make the appropriate decision. *Section 1.4.1 of the draft final RI report explains this decision.*

C. See the response to comment no. 6.

8. **Comment:** **Background and Ambient Screening Concentrations for Metals. Since the RI data were used to calculate ambient and background concentrations, these concentrations may be too high. Samples from areas not impacted by site activities should be used for determining ambient and background concentrations.**

Response: *For the reasons outlined below, no changes were made to the draft final RI report based on this comment.*

The background concentrations for metals at YBI were developed by collecting samples from areas not affected by IR site activities. This

approach was not used for TI to develop ambient metals concentrations because the Navy and the regulatory agencies agreed that sufficient data existed from TI sites that were not affected by any potential metals sources. The ambient metals concentrations established for soils at TI are consistent with ambient levels established throughout the San Francisco Bay region. *The approach is explained in detail in Appendix F of the draft final RI report.*

9. **Comment:** **Elimination of Essential Nutrients. At what concentrations do the essential nutrients (calcium, iron, magnesium, potassium, and sodium) become hazardous?**

Response: *For the reasons outlined below, no changes were made to the draft final RI report based on this comment.*

The essential nutrient screening applied at NAVSTA TI is consistent with U.S. Environmental Protection Agency (EPA) and the CaliforniaDepartment of Toxic Substances Control (DTSC) guidance, which indicate that these elements can be deleted from the risk assessment because of their low toxicities at environmental concentrations. Currently, with the exception of zinc, no toxicity values have been developed for essential nutrients. Because a toxicity value is available for zinc, the baseline human health risk assessment (BHHRA) includes an evaluation of the potential adverse health effects associated with this essential nutrient. In addition, no EPA Region IX preliminary remediation goals have not been derived for these essential nutrients. Although toxicity values generally are not available in published literature, the levels present at the site are not anticipated to pose a threat to human health; this is because the concentrations of essential nutrients detected at TI and YBI are generally within the range of background concentrations for the California and the Western United States. Furthermore, the concentrations of essential nutrients detected at NAVSTA TI are comparable to recommended daily allowances (RDA) established by the National Research Council. *A comparison of essential nutrient concentrations detected at TI to background levels in California and dietary requirements is presented in Table 3-5 of the draft final RI report.*

10. **Comment:** **Exposure Pathways/Future Land Use. Includes the following comments: (A) lack of discussion about the interim and future reuses of NAVSTA TI lands and the exposure pathways are a gap in both the human health and ecological risk assessments and the potential contamination pathways and receptor analyses for these assessments have not been adequately addressed; and (B) seasonal variations of flora and fauna were not evaluated.**

Response: (A) *For the reasons outlined below, no changes were made to the draft final RI report.*

(B) *Data from the plant survey were incorporated into the draft final RI report based on this comment. Data from the plant surveys are presented in Table 2-3 and data from the animal survey are presented in Table 2-5 of the draft final RI report.*

A. The future land uses are addressed in the RI report, and the appropriate exposure pathways are evaluated as part of the human health risk assessment. The receptors and exposure pathways and their corresponding assumptions were developed within the context of current and anticipated future land use of TI and YBI. However, because it is difficult to determine actual land use (or interim land use) at a closing base or to accurately predict future land use at each site, the following receptors were evaluated for every site, covering all potential future reuses of the sites: a commercial/industrial worker, a recreational visitor, and a resident.

Based on the NAVSTA TI draft reuse plan, a commercial or industrial worker is the most likely receptor at the site. However, for the reasons provided above, it was conservatively assumed that future land use may deviate from that proposed in the NAVSTA TI reuse plan. At the request of the regulatory agencies, each site was also evaluated assuming that land use is unrestricted (residential). An unrestricted land-use (residential) scenario generally provides the greatest potential for exposure to site contaminants, so that sites found to have an acceptable risk for this scenario will also have acceptable risks for other uses. The unrestricted land-use scenario is very conservative (health protective) for the NAVSTA TI sites, in view of current and projected future land use. For the assessment of an unrestricted land-use scenario, it is assumed that all existing structures, buildings, and paved areas are removed from the site. Realistically, if a site were to be developed for residential use, much of the area would be covered by homes and paved areas, such as streets and driveways, that would serve to reduce potential exposures and risks.

Impacts to ecological receptors were not considered; under any of the three scenarios (commercial/industrial, residential, or recreational), the habitat quality on TI would not change. However, ecological exposure pathways were considered on YBI, where there is adequate habitat and receptors. Although the reuse scenarios were not directly considered, the ecological risk assessment evaluated the potential effects of contamination left in place (which is a conservative approach). The future reuse scenarios may involve construction and paving, which would eliminate the habitat.

The Navy believes that its evaluation of contaminant and exposure pathways for future uses was adequate for both the ecological and human health risk assessment.

The methodology for the risk evaluation is explained in Sections 3.7 and 3.8 and Appendices G and J of the draft final RI report.

B. Seasonal variations of flora and fauna have been evaluated at NAVSTA TI. Surveys of threatened and endangered plants were conducted in spring, summer, and fall 1996 by Tetra Tech Inc. And Michael Wood of Botanical Consulting Services. Mr. Wood did not identify any threatened or endangered plants; however, he did locate a plant considered rare by the California Native Plant Society. This is the dune gilia (*Gilia capitata*, ssp. *Chamissonis*). The data from the survey will be incorporated into the draft final RI report.

Breeding bird population surveys were conducted in the spring and summer of 1991. Audubon Society winter bird counts from 1990 and 1991 were also used in developing the bird species list for NAVSTA TI. The presence of mammals and invertebrates on the island should not be affected by seasonal variation.

The data from the bird surveys are summarized in Table 2-5 of the draft final RI report.

11. Comment: **Investigation During Remedial Activities. The lateral and vertical extent of contamination needs to be determined before remedial activities (such as the feasibility study) are begun. A remedy cannot be selected without an accurate estimation of the amount of soil requiring remediation.**

Response: *For the reasons outlined below, no changes were made to the draft final RI report based on this comment.*

The Navy believes that the RI identified the lateral and vertical extent of contamination sufficiently to continue to the feasibility study (FS). In addition, the estimation of soil volume that requires remediation will be further defined during the preremedial design phase.

12. Comment: **Incompleteness of the RI report. Draft RI report was issued before completion of groundwater modeling, petroleum hydrocarbon toxicity testing, and additional sampling at Sites 12 and 17. Recommendations for the majority of the sites are incomplete because the above items are necessary to make meaningful recommendations.**

Response: *Changes were made throughout the draft final RI report by incorporating the results of the groundwater modeling, the TPH*

toxicity testing, and the results of the additional sampling at Sites 12 and 17. Citations are provide below.

The Navy believes that the draft RI report achieved its objective of defining the nature and extent of contamination. However, since the draft RI was completed, additional sampling (Sites 12, 17, and 24), groundwater modeling, and TPH toxicity testing have been performed. *The additional data collected since the time of the draft RI are reflected in the following sections:*

Site 12 results are discussed in Section 12.6 and the data are presented in Tables 12-4 and 12-5.

Site 17 results are discussed in Section 13.6 and the data are presented in Tables 13-4 and 13-6, and Figures 13-2 through 13-5.

Modeling and TPH toxicity comparison data are presented in the "Nature and Extent of Contaminants of Concern" subsections of each section.

Results of additional groundwater sampling at Site 24 are presented in the draft Site 24 Additional Characterization Summary Report (October 1997). This information will be incorporated into the final RI report.

It is important to note that the RI/FS process is an iterative process, and there will be times when the Navy will need to collect additional information based on field activities, new information on cleanup technologies, or changes in regulatory approach. At other installations, the Navy has included the groundwater modeling as part of the FS. The Navy views the additional information as something that can help fill in the picture, but believes that for some sites, sound decisions could be made without the additional information. Regarding the TPH toxicity testing, the results will refine the work to be conducted as part of the FS. In addition, because the species used for the toxicity testing was not available for the bioassays until November or December, the RI/FS process would have been delayed for 5 months had the Navy waited to report the results before submitting the draft RI report. For most sites, the Navy has made conservative recommendations to move the sites on to the FS until further information was available. By recommending that a site proceed to the FS until further information is available, the Navy avoids making a recommendation that may not be protective of human health and the environment. Site recommendations can be modified as needed.

13. **Comment:** **Due to the faulty results of field testing it is imperative that the Navy maintain control of and access to the field samples. It is important that it be clearly stated where and for how long storage**

will be. It is anticipated that conflicting opinions and doubt will require new lab analysis in a more traditional manner.

Response: *For the reasons outlined below, no change was made in the draft final RI report in response to this comment.*

The sample storage and custody requirements are described in the phase I RI field sampling plan (PRC 1991). The basic requirements are that samples be stored in a locked area while proper preservation of the samples and proper documentation are maintained, including sample labels and chain-of-custody forms. Samples collected in the field are generally shipped to the laboratory for analysis as soon as possible; however, they are often stored overnight to accommodate shipping schedules or to wait for field screening results. When stored overnight, they are kept in a refrigerator inside a locked room to which only the sampling personnel have access. A custody seal is placed on the refrigerator to ensure that no tampering has occurred. Similar precautions are taken to maintain control of the samples during shipment and once the samples arrive at the laboratory.

Most samples have a maximum holding time of 14 days, which means that sample analysis should begin within this time period. However, samples are generally stored at the laboratory for 60 to 90 days after collection to allow for reanalysis, if required.

14. Comment: **It is unclear from the number and placement of borings and monitoring wells how plume characteristics and groundwater elevation contours were established. Some contours appear to have only two or three borings throughout the entire island. The sampling sites seem arbitrarily chosen. They are missing from much of the circumference of the area of suspected contamination; therefore, it is doubtful that shape and extent of the plumes can be accurate. Too much modeling may have been involved leading to a loss of accuracy in the name of cost-effectiveness.**

Response: *For the reasons outlined below, no change was made in the draft final RI report in response to this comment.*

The plume characteristics and groundwater elevation contours were developed manually based on the available RI data. No modeling was used in the development of the plumes or the groundwater elevation contours. In some cases, dashed contours were used because there were insufficient data to support an accurate placement of a portion of the contour line. Some contours were developed from a limited number of data points; for example, a limited number of monitoring well samples were available to develop the plume maps for VOCs at Site 21 in the deeper groundwater depths. However, because the edge of the plume was identified by the samples and because data from the shallower groundwater samples, showed similar plume characteristics, the plume is adequately characterized.

Identification of the extent of contamination was a primary objective of this investigation, and the Navy believes this objective was accomplished. While samples were not collected in all areas within the site boundaries, the investigation of each site began in the area of suspected contamination and moved outward from there to identify its extent.

Recommendations:

At the end of the RAB technical subcommittee presentation, the presenters made the following recommendations:

a. **Review all existing data to determine what is valid, what can be used and what needs to be discarded.**

Response: Such a review was performed during the preparation of the RI report. All data presented are considered are usable and valid.

b. **Determine where the data gaps and poorly characterized sites are located and what needs to be done to complete the RI work to arrive at a scientifically valid assessment.**

Response: The Navy believes that the RI work provides adequate data to make a scientifically valid assessment overall and achieves the objectives of the RI; however, additional sampling has been performed or is planned at Site 24 and Site 12. Results for Site 24 better define the chlorinated solvent plume and are available in the draft Site 24 Additional Characterization Summary Report (October 1997). Results for Site 12 are expected to be available in January 1998. Those results will be factored into the FS.

c. **Focus results of the supplemental RI work on addressing site contamination and how they will impact future reuses of the sites, no matter what those reuses might be.**

Response: The risk assessment examines three reuse scenarios (unrestricted [residential], commercial/industrial, and recreational), and the potential effects of site contamination on future users.

d. The Navy, City of SF, regulatory agencies, and RAB should work closely and interactively to address items nos. a through c above to ensure that in the final RI report there are no surprises.

Response: The Navy has worked closely with the regulators (who are members of the NAVSTA TI Base Realignment and Closure [BRAC] Cleanup Team [BCT]) to develop the draft final RI report and has maintained ongoing communication with the City of San Francisco. Several special meetings were held with RAB members to further clarify the BCT's rationale for its approach and findings in the RI report. This dialogue will continue through the Record of Decision for the CERCLA sites and the Corrective Action Plans for the Petroleum sites.

e. Do not issue either a draft final or final RI report until the supplemental RI work is completed and all parties are in agreement.

Response: Supplemental work conducted since the draft RI was issued includes TPH toxicity testing, groundwater modeling, and additional sampling. As noted in the response to RAB comment 12, these data have been incorporated into the draft final RI report (with the exception of outstanding sampling data at Sites 12 and 24, which will be factored into the FS). While there may be several issues on which the Navy and members of the RAB disagree, the Navy believes its data are fully adequate on which to base sound decisions and to move forward toward the FS and the ultimate reuse of NAVSTA TI. The Feasibility Study phase will offer a continued opportunity for dialogue on the CERCLA sites.

COMMENTS FROM RAB MEMBER KAREN MENDELOW

The following comments were received from Ms. Karen Mendelow and pertain specifically to Site 12, as discussed in Chapter 12 of the draft RI report for NAVSTA TI.

1. **Comment:** **Potential contaminants collected near play areas. P. 12-4**
What is being done now? Is there any possible hazard for kids playing there now?

Response: Potential risks to the health of children at Site 12 were evaluated using data collected during three separate investigations. During an investigation of Site 12 conducted by the Navy in 1992, eleven playgrounds and surrounding areas were sampled (PRC 1992). The results of a preliminary risk assessment based on the data obtained during this 1992 investigation indicated that there was no potential associated with contamination at Site 12 threat to the health of children.

In 1996, the Navy conducted an investigation at IR Site 12 that was specifically designed to sample lead in soil from lead-based paint, as required by Housing and Urban Development (HUD) guidelines. Most lead concentrations detected

in samples collected during the lead-based paint study were below the TI-specific lead concentration. The TI-specific lead concentration in soil (216 mg/kg) is equivalent to the target blood-lead level of 10 micrograms per deciliter (μg/dL). The Center for Disease Control (CDC) has stated that prevention activities should be directed to reducing children's blood lead levels to below 10 μg/dL (CDC 1991). Data on lead were collected for the site-specific environmental survey (SSEBS) and finding of suitability to lease (FOSL) for Reuse Zone 4 (PRC and Uribe Associates [U&A] 1997).

Data from these two studies are combined with data obtained during the RI at Site 12 and presented in Chapter 12 of the draft final RI report. The findings summarized in the draft final RI report indicate that it is unlikely that children will experience adverse health effects from exposure to contaminants detected in surface soils at Site 12.

In addition, the Navy has scheduled further investigation at Site 12 in areas not previously sampled. In contrast to the sampling conducted for the RI, the additional investigation is not based on sources from the historical use of Site 12. While it is unlikely that the additional data will affect the results of the risk assessment performed for Site 12, should the data be significantly different from previous data, the Navy will revise the conclusions of the RI for Site 12 and the Zone 4 SSEBS/FOSL.

2. **Comment:** **Exposure pathways. P. 12-27. Section 12.7.2.3**
Are residents and reusers advised of potential risks especially in regard to homegrown produce and play?

Response: In the SSEBS and FOSL for Reuse Zone 4 (PRC and U&A 1997), it is recommended that residents of housing areas at Reuse Zone 4 (including Site 12) be prohibited from eating homegrown produce. This is a conservative (health-protective) recommendation given that very few lead concentrations exceeded the TI-specific lead concentration in soil. Residents at Site 12 will be advised in their leases of the lease restrictions stated in the FOSL.

3. **Comment:** **Any sampling of young children (< 5) for area being correctly done for metals? (school children?)**

Response: When potential future use of a site includes residential land use, children are often the most sensitive receptors identified at the site. Consequently, the potential exposure of children to metals identified at the site were evaluated in the human health risk assessment conducted at Site 12, as presented in Chapter 12 of the draft final RI report. The methods used to evaluate the potential risks to the health of children at the site are consistent with EPA and DTSC guidance for conducting human health risk assessments at contaminated sites.

4. **Comment:** **Recommendations should be included presently in "right to know" for residents that currently live there as well as issues should be brought forward into San Francisco Reuse Plan.**

Response: No one currently resides at Site 12, and it is the Navy's understanding that the City's proposal to utilize the Site 12 housing would not take effect until after January 1, 1998, and that there is no firm date for leasing the housing area.

Residents that occupy the housing at Site 12 in the future will be advised in their leases of the lease restrictions stated in the FOSL, as noted in response to comment 2 above.

COMMENTS FROM RAB MEMBER DALE SMITH

1. **Comment:** **The bird survey is poor. To identify resident species, observations need to occur in the winter as well as the summer. There was no migratory bird survey at all and the Pacific Flyway passes over Yerba Buena Island.**

Response: Data from bird surveys performed in the winter of 1990 and 1991 (Audubon Christmas bird survey data, Feinstein 1992) and the spring and summer of 1991 (Bailey 1992) were used to develop the species tables in the RI report. These data are from periods of the year that encompass both resident and migratory bird seasons. The references for the data sources are as follows:

- Bailey, S. 1992. "Breeding Birds Confirmed in 1991 on Treasure Island and/or Yerba Buena Island." Personal Report to Public Affairs Office at NAVSTA TI. March.
- Audubon Society, Golden Gate Chapter.1992. Personal Communication of Audubon Society Christmas bird survey data for Treasure Island from 1990 and 1991. Feinstein, A.

2. **Comment:** **Monarch butterfly migrations weren't considered and they would be likely to use the eucalyptus in Yerba Buena as well as Treasure Island.**

Response: Monarch butterfly migrations were not considered because the only sites with eucalyptus that were investigated due to possible contamination are located adjacent to the freeway (Site 29) or the off-ramp (Site 28). The trees in these areas are not likely to be utilized by Monarch butterflies due to their proximity to the roads. The other eucalyptus habitats on YBI are not associated with sites requiring remedial investigation.

3. **Comment:** **The plant surveys have factual errors. The broom of concern presumably is genista monspessulana, not canariensis, which is not known to occur in the Bay Area. Cotoneaster is not native to the United States, let alone California. Pinus muricata, though native to California, is not indigenous**

to the Bay Area. It's [sic] southern extent in Northern California is Point Reyes.

Response: The plant information will be updated using a survey conducted at YBI became available after the draft RI was released. The reference for this document is as follows:

Tetra Tech, Inc. And Botanical Consulting Services. 1996. "Special Status Plant Survey and Habitat Assessment for Naval Station Treasure Island, Yerba Buena Island, California." Prepared for U.S. Navy, Engineering Field Activity West, San Bruno, California. November.

COMMENTS ON ADDENDUM 1: CONTAMINANT FATE AND TRANSPORT MODELING REPORT

Comments on Addendum 1 were received from RAB members Patricia Nelson and Paul Hehn. For the purposes of this response, comments that address similar issues were combined.

1. **Comment:** **There are two fatal flaws in the Contaminant Fate and Transport Modeling Report, Addendum No. 1 which are:**

   (1) the use of the Seasonal Soil Compartment (SESOIL) model when it was determined it would not work for the unsaturated soils at Treasure island because of its shallow groundwater, and

   (2) the assumption in the assessment that the only exposure to contaminants observed in groundwater at NAVSTA TI would be aquatic receptors. The contaminated groundwater should be considered non-potable source of water for industrial or irrigation use, thereby creating an exposure pathway to humans on NAVSTA TI.

   Please explain why an alternative model, such as VLEACH, was not employed for the purpose of this analysis. In addition, explain why the groundwater was not considered as a source of water for industrial or irrigation use.

   Response: The Navy's initial proposal for modeling contaminant fate and transport of contaminants in the vadose (unsaturated) zone using the SESOIL model appeared in "Approach to Development of Petroleum Cleanup Goals Protective of the San Francisco Bay, Naval Station Treasure Island, San Francisco, California" (PRC 1995). The SESOIL model was selected because of its wide regulatory acceptance, particularly in California where this model was used extensively and recommended for use in the Leaking Underground Fuel Tank Manual (State Water Resources Control Board 1989).

   The purpose of the screening level modeling at NAVSTA TI was to identify ecological chemicals of concern at NAVSTA TI. Originally, the Navy's proposal included a combination of the vadose zone model (SESOIL) and the saturated zone model (AT123D). However, because of predominantly shallow groundwater conditions and the many uncertainties inherent in the vadose zone modeling, the use of the SESOIL model was limited. In the course of SESOIL application, it was found that the method was not effective for vadose zone modeling. The application of any vadose zone model (including VLEACH) is uncertain because it requires estimates of many parameters (for example, temporal and spatial distribution of contaminants in soil, moisture content, solubility, and metals speciation) that are very difficult to obtain and would be extremely costly and time consuming. Therefore, because of the uncertainties associated with vadose zone modeling, the

study focused on modeling the fate and transport of contaminants in the saturated zone, using the AT123D model. This approach was considered appropriate because at most sites contaminated soil is in contact with the groundwater. (Discussion of the uncertainties associated with the vadose zone is presented in Section 6.1 of Addendum 1.)

The groundwater modeling with AT123D was very conservative since it only accounts for sorption and dispersion. The modeling did not include the potential for chemical degradation, biodegradation, or dilution in the tidally influenced zone, all of which would likely lessen any impact to aquatic receptors.

The modeling focused on potential exposure of contaminants to ecological, rather than human receptors. With regard to whether groundwater at NAVSTA TI can be used as a source of water for industrial or irrigation purposes, TI groundwater is unlikely to have a beneficial use for agricultural or industrial purposes for several reasons. The groundwater is limited in quantity, has a relatively high salinity content (which would increase as a result of salt water intrusion caused by pumping), and pumping of groundwater could result in potential land subsidence.

During an April 4, 1997 meeting, BRAC Cleanup Team members from the U.S. EPA, DTSC, and the RWQCB agreed that the Navy did not need to evaluate human health risks associated with beneficial uses (including agricultural, industrial service, and industrial process supply) of groundwater for the RI report.

In summary, a conservative saturated zone model (AT123D) was used for fate and transport modeling that is protective of ecological receptors. The Navy and agencies also agree that the potential for beneficial use of groundwater is extremely limited, and therefore human health risk associated with these uses was not evaluated. This decision will then have to be codified in the future decision document with an administrative control that would not permit the use of groundwater at Treasure Island. Use of groundwater is not a permitted use in any of the interim leases with the City.

2. **Comment:** **Fate and Transport Conceptual Model: The modeling assumes a decrease in contaminant concentrations (attenuation) to result only from sorption, dispersion, and dilution. How were these assumptions developed.**

Response: Sorption, dispersion, and dilution were selected as attenuation processes to provide a very conservative estimate of contaminants in groundwater that may reach the bay at concentrations above ambient water quality criteria (AWQC). These attenuation processes reduce the concentration of a chemical as it migrates vertically from the affected soils to groundwater and then is transported laterally to the bay. Other attenuation processes that would likely occur at NAVSTA TI were not considered in order to increase conservatism of the screening-level modeling. For example, chemical transformation, biodegradation, and dilution with bay water were not included in the modeling although they are likely to occur. Chemical

transformation and biodegradation would reduce not only the concentrations of a chemical but also the chemical's total mass. Tidal fluctuations are another attenuation factor that was not considered. Tidal fluctuations increase vertical dispersion in the contaminant plumes near the shoreline and, therefore, reduce concentrations in groundwater discharged to the bay *(see Section 3.2)*.

3. **Comment:** **Selection of Constituents for Modeling: The use of ambient metal concentrations in the soil as presented in the Draft RI [remedial investigation] report may be incorrect and may need to be revised based on further discussion. Therefore, the use of these concentrations may put incorrect or questionable data into the model at the very beginning of the process.**

Response: Initially, selection of metals for modeling used an approach considering both metals in soils and in groundwater. Originally, if metals concentrations in site soils exceeded ambient soil metals concentrations and concentrations in site groundwater exceeded AWQC, these metals were selected for modeling. Subsequently, this approach was revised and all metals that exceeded AWQC in groundwater were modeled and included in the revised Addendum 1 (see Section 5.0).

4. **Comment:** **Modeling in the Unsaturated Zone: Vadose zone model used to evaluate whether continued leaching from the unsaturated zone would increase the currently observed concentrations in groundwater. What if the level stays relatively constant over some time period or decreases? Are these cases also considered and discussed?**

Based on observed concentrations of a contaminant in soils, the model-predicted concentrations of this contaminant in groundwater did not match the observed concentrations. Was it due to higher soil concentrations at the site that have not been detected or due to contaminated soil in direct contact with the groundwater? Couldn't both of these conditions be present and what would that do to the model? If other screening-level models such as SUMMERS or VLEACH would be more appropriate, why was the modeling not done using these models?

Response: A future increase from currently observed concentrations of contaminants in groundwater beneath contaminated soils corresponds to a worst-case scenario. Therefore, only this scenario was discussed.

As described in the response to comment 1, at a given portion of the modeled site, the combination of such factors as contaminated soil in direct contact with the groundwater and high concentrations in vadose zone soils would provide a worst-case scenario for modeling.

Based on observed concentrations of a contaminant in soils, the unsaturated (vadose) zone model was developed to *overestimate* the resulting concentrations of this contaminant in groundwater. When the SESOIL model predicted the

concentrations of a contaminant to be *less* than were observed in groundwater, several factors could account for this discrepancy. One of these reasons is related to an uncertainty in temporal and spatial distribution of a contaminant in site soils. Generally, it is unknown when, where, and for how long a contaminant was released to vadose zone soils. This is especially the case at Site 11, where contaminants might originate from various sources at various times. Spatial distribution of contaminants in soils can only be approximated based on point data (grab samples) that may affect model outcomes. Another reason is the use of published values rather site-measured input parameters (for example, sorption coefficients). Hence, the outcomes of the SESOIL modeling depend on a careful selection of modeled conditions and input parameters. Such modeling would have required a detailed approach that was beyond the scope of screening-level modeling.

Use of other screening-level models such as SUMMERS and VLEACH, as noted in the response to comment 1 above, would involve similar uncertainties.

5. **Comment:** **The modeling used groundwater concentrations measured during groundwater sampling in 1995. Why were the more recent groundwater sampling results not used? Did the modeling include the groundwater sampling from the new wells installed during the Phase IIB RI? If not, the model application and usefulness to the conditions known at the end of groundwater sampling from all wells may be limited.**

Response: As a worst-case scenario, the highest concentrations detected at a site were used in the modeling, including hydraulic punch groundwater sampling results and the latest Phase IIB monitoring well results from November 1995 to November 1996.

6. **Comment:** **Figures: Site 05, Old Boiler Plant and Site 15, Old Fuel Farm. The second figures showing concentrations referred to in the text should be included for these sites. Site 09 - Correct title of Figure 22 for Site 09, the Foundry.**

Response: For each selected constituent at each site, two figures are presented. The first figure illustrates model-simulated concentrations of a constituent at the source, and the second figure depicts predicted contaminant concentrations at the shoreline if the concentrations are above zero. For Site 05, a second figure was added. For Site 15, because the model predicted zero concentrations of phenanthrene at the shoreline, a second figure was not included. The title of Figure 22 was corrected to state "Treasure Island."

7. **Comment:** **Site 14/22, New Fuel Farm/Navy Exchange Service Station. Was diesel also detected in the groundwater from this site? If so, was diesel or some surrogate of diesel modeled for this site? If so what was the outcome?**

Response: As described in Section 5.0 of Addendum 1, Selection of Constituents For Modeling, only constituents that were detected in groundwater at concentrations above AWQC were modeled. Diesel constituents were detected in groundwater at Site 14/22; however, constituents associated with diesel were not detected in groundwater at concentrations above AWQC. Therefore these constituents were not selected for modeling. Section 7.0 of Addendum 1, Individual Site Summaries and Modeling Results, discusses the constituents that were modeled.

8. **Comment:** **Summary and Conclusions. The models are based on the use of individual hydrocarbon constituents for benzene and naphthalene. However most of the models for petroleum hydrocarbons such as diesel used phenanthrene instead of naphthalene. Why was this changed and how representative of diesel is it? If naphthalene were used instead of phenanthrene would the modeling results be the same? It appears that the concentrations for naphthalene were generally higher than phenanthrene in groundwater. Would this switch in constituents to naphthalene resulted in different model results since the initial groundwater sample results were higher?**

Response: The above comment is not correct; modeling was not based on benzene and naphthalene only. All constituents for which an AWQC exists were screened and modeled. For constituents associated with gasoline, AWQC have been established for benzene, ethylbenzene, toluene, and others. For constituents commonly associated with diesel, AWQC have been established for fluoranthene, fluorene, naphthalene, phenanthrene, and others. As described in Section 5.0 of Addendum 1, Selection of Constituents For Modeling, only constituents that were detected in groundwater at concentrations above AWQC were modeled. Phenanthrene, for which an AWQC of 4.6 micrograms per liter (μg/L) has been proposed, is highly toxic to aquatic ecological receptors. Naphthalene is not as toxic as phenanthrene, and has been assigned a higher AWQC of 2,350 μg/L. Since the AWQC for phenanthrene is much lower than for naphthalene, phenanthrene exceeded the AWQC at several sites. Naphthalene was not detected in groundwater at concentrations above AWQC at any site.

COMMENTS ON ADDENDUM NO. 2: ADDITIONAL CHARACTERIZATION OF SITES 12 AND 17

Comments on Addendum No. 2 were received from Patricia Nelson and Paul Hehn. For the purpose of this response, comments that addressed similar issues were combined as one comment.

Objective of Investigation

1. **Comment:** **It is unclear whether the objective of delineating the extent of localized contamination (which was not completely defined in the Phase IIB RI field investigation) was met for Site No. 12. Specifically, there were other areas than that surrounding monitoring well no. 12-MW16 where contamination was observed in the Phase IIB RI field investigation that were not addressed in the supplemental work summarized in RI Addenda No. 2. Although the community RAB members understand that there will be a more comprehensive work plan addressing further investigation of Site No. 12 prepared and implemented in summer of 1997, the purpose of the supplemental work summarized on page no. 1 should be modified to define more clearly the meaning of the term localized.**

   Section 2.0. Purpose. This section starts off with the statement that the purpose is to define the extent of localized contamination. It is not know whether or not the contamination is localized or not as a purpose. This seems to present a preconceived notion or conclusion before the work is even done.

   Response: The use of the term "localized contamination" was not intended to imply that there are no other areas of contamination present at Site 12; rather, the term was used purposely to limit the scope of the Addendum 2 investigation to one area of Site 12, near monitoring well 12-MW16. This area was identified as having the most immediate data gap at Site 12. Addendum 2 presents the results of the investigation in this area. While an effort was made in Addendum 2 to interpret the new data in conjunction with previously collected data, Sections 12.6.1 and 12.6.2 of the draft final RI report provide a comprehensive interpretation of the Site 12 data.

   Additional data gaps within Site 12 were filled through an investigation that was conducted in November 1997. This additional sampling used more of a "regional" and systematic approach, in which samples were collected from locations throughout Site 12. These additional data are not currently available but will be presented in an addendum to the RI and factored into the feasibility study (FS) as well as into any decisions regarding future reuse of Site 12.

2. **Comment:** **It is unclear whether the objective of delineating the extent of localized contamination (which was not completely defined in the Phase IIB RI field investigation) was met for Site No. 17. Although additional data were obtained for the purposes of preparing the Addenda No. 2 document, there is an "outlier" concentration of 0.2 μg/L of trichloroethene (TCE) at sampling point 17-HP11 which is not enveloped in the contour and may suggest that the volatile organic compounds (VOC) plume should be further investigated in the north-northwest portion of Site No. 17. Also the relationship between contaminant plumes emanating from IR Sites 05 and 17 and the downgradient IR Site 24 as depicted by contours in Figure No. 6 is unclear. In addition, the**

contour suggests, the predominant direction of gradient appears to be northerly rather then the defined groundwater flow direction on the figure, a northeasterly direction.

Section 2.0. Purpose. Again, by only looking at a small area of Site 17 and not the overall site and the sites that surround it, this does not present the big picture for overall questions of delineation.

Response: With the additional characterization data gathered during this phase of the investigation, the Navy was able to determine that there is no VOC above the AWQC at Site 24 and 17. The groundwater characterization results for Sites 17 and 24 are discussed in Sections 13.6.2 and 15.6.2 of the draft final RI report. The discussion in Section 13.6.2 focuses on the additional characterization of Site 17, which was initiated because of VOCs originally detected at location 05-HP05 on Site 05.

The groundwater sample results presented on Figure 13-2 of the draft final RI report show that there are numerous samples (17-HP11, 17-HP12, 17-HP13, 17-HP14) with low concentrations of VOCs that were collected between areas of VOC contamination at Site 24 (near building 99) and 05-HP05. The TCE result at sampling location 17-HP11 (0.2 ppb) is not considered an "outlier" because the concentration is well below the AWQC value of 2,000 ppb and is therefore, considered a low concentration.

Finally, the groundwater contour for tetrachloroethene (PCE) in Figure 6 of Addendum No. 2 is slightly distorted in the northerly direction because of the sample collected at 17-HP13 (4 μg/L). This is the reason that the plume depicted on the figure does not match the defined northeasterly groundwater flow direction. The important information on the figure is that the highest PCE concentration was collected at 05-HP05, and that all VOC concentrations in all samples collected at Site 17 and 05 are below the AWQC values.

Potential Sources

3. **Comment:** **Section 3.3.1 Nature and Extent of Contamination at Site 12—Evaluation of Adequacy of Data. Mentions the suspected debris disposal area. What suspected disposal area? Where was (is) it located and what did it contain? This should be discussed earlier in the report in either the introduction or the purpose section not just thrown in here.**

Response: The Navy agrees that a discussion of the suspected disposal area is important to interpret the Site 12 data. There are several suspected debris disposal areas located at Site 12. The information regarding these areas is presented in the front of the Site 12 chapter (Section 12.1) of the draft final RI report. The information includes the approximate locations of the disposal areas, suspected debris contents, and whether or not the debris has been removed.

4. **Comment:** **A description of the potential sources of contaminants for IR Site 17 would have been helpful since the neighboring IR Site 24 has similar contaminants from its former use as a dry cleaning facility.**

Response: Unfortunately, identifiable sources of contamination are not always identifiable at IR sites. In the case of Site 17, research did not identify any records that would have indicated a source of chlorinated solvents at this location. The source may have been an incidental spill, possibly of dry cleaning solvent, but such speculation adds little information to the overall knowledge of the site contamination. Instead, the investigation focused on defining the extent and nature of contamination to help form the basis for the FS.

Field Sampling Approach (Immunoassay)

5. **Comment:** **Please identify the type and manufacturer of the immunoassay kits used in the field since they were not described in the text.**

Response: The TPH immunoassay kits for analysis of soil and groundwater were manufactured by Ensys, Inc. (now known as SDI). These are the same type of immunoassay kit used during the phase IIB RI.

6. **Comment:** **Immunoassay field test kits were used for the Site 12 work and of the 16 samples analyzed by this method, 6 were analyzed by a traditional laboratory method. Please specify whether the immunoassay test results were confirmed by the traditional laboratory methods and the rate of false negatives or false positives, if any.**

Section 3.1. Site 12 Field Sampling Approach. Even though there were problems identified with the use and reproducibility of the immunoassay method as presented in the Phase IIB report, here it is being used again for exactly the same constituents as caused problems during the Phase IIB work. Why is it being used again? What was the reproducibility of the analytical work done by the off-site laboratory versus the immunoassay?

Response: The immunoassay samples were used during the additional investigation at Site 12 as a screening analysis to select which of the soil samples would be submitted to the laboratory for analysis. The Navy confirmed the validity of the immunoassay results through a certified laboratory analysis. The immunoassay results were combined with previous immunoassay data; however, these data serve the site characterization in a supporting role only. Of the 16 soil samples collected at Site 12, 6 samples (40 percent) were analyzed by an off-site laboratory. All 8 water samples collected at Site 12 were analyzed by an off-site laboratory. The comparison of the immunoassay and laboratory results is presented in Table 12-3 of the draft final RI report. The TPH discussions in Sections 12.6.1 and 12.6.2 present the results of the immunoassay tests.

7. **Comment:** **Section 3.1. Site 12 Field Sampling Approach. Previous sampling and analytical problems with the immunoassay were reported to be a result of motor oil in the sample. Can the same interference result from the heavier fraction that remains from weathered diesel? Was this the cause of the problems with the immunoassay in the past since most of the site detected high concentrations for diesel?**

Response: The heavier petroleum hydrocarbons detected at Site 12 were identified as a possible interference in the use of the immunoassay analysis. The source of these heavy hydrocarbons may be either weathered diesel or oil (both of which are reported as motor oil in the analytical results). These same heavier weight hydrocarbons may have interfered with immunoassay results in previous investigations.

8. **Comment:** **Section 3.2.1. Site 12 Soil Sampling Results. Were any of the soil samples from Site 12 for TPH-purgeables checked by analysis at the off-site laboratory or are all of the results for TPH-purgeables from the immunoassay methods. Are they reliable and reproducible?**

Response: All of the TPH-purgeable samples were analyzed by an off-site laboratory using the method specified by the California Leaking Underground Fuel Tank (LUFT) field manual (1989). The accuracy and precision of the method are measured directly to ensure a reliable analysis. Surrogate standards and matrix spike samples measure the accuracy of this method (75 to 125 percent recovery required for the surrogate and spike compounds), and duplicate samples measure the precision (maximum percent difference allowed is 25 percent).

Sample Collection Methods

9. **Comment:** **Reference is made to utilizing the Phase I RI field sampling plan for which a copy has not been provided the community RAB. Please describe what methods were used and explain why this was used rather than that prepared as part of the Phase IIB RI.**

Response: The phase I RI sampling plan contains general descriptions of sample collection techniques, such as how to collect a groundwater sample from a monitoring well, and how to pack a sample for shipment to the laboratory. All sampling, analytical, and data evaluation procedures used during any phase of the RI are presented in Chapter 3 of the draft final RI report. The discussion in Chapter 3 is the most complete description of the procedures used during the RI. The phase IIB work plan contained additional methods for using the Geoprobe. Both the phase I and phase IIB work plans were used to develop the draft final RI report.

Data Quality

10. Comment: **The majority of analytical data contained in the appendix is "qualified" in a manner that indicates there are quality assurance/quality control (QA/QC) problems with the results. This is not the first time in the RI process that there have been QA/QC issues with the analytical data. Please provide the community RAB Technical Subcommittee a copy of the case narratives so that we may determine whether the data is of any use for the RI analysis.**

Response: Data validation is performed to assess whether laboratory data are adequate for their intended use (site characterization and risk assessment). The following information presents the steps the Navy uses in the data validation process

With respect to the data validation methodology, the laboratory analytical data generated during the NAVSTA TI RI were validated according to procedures outlined in the following documents:

- CLP "National Functional Guidelines for Organic Data Review" (EPA 1990)
- CLP "National Functional Guidelines for Inorganic Data Review" (EPA 1988)
- Final NAVSTA TI RI quality assurance project plan (QAPjP) (PRC 1991)
- EPA approved analytical methods

The following QA/QC information was evaluated during the data validation process for all samples collected for the RI:

- Holding times
- Initial and continuing calibration requirements
- Spiking accuracy (laboratory control sample), blank spike sample, matrix spike and matrix spike duplicate sample, surrogate spike)
- Precision of field and laboratory duplicate samples
- Field and laboratory blank results
- Internal standard performance
- Overall assessment of the data

Data qualifiers were assigned to the results according to EPA guidelines, procedures outlined in the QAPjP, and associated analytical methods, as follows:

- No QA/QC problems: Sample data is acceptable for use.
- Minor QA/QC problems: Sample data is estimated (J qualifier), but acceptable for use; an example of a minor QC problem is a percent recovery of 64 percent, which is outside the criterion of 75 to 125 percent.
- Major QA/QC problems: Sample data is rejected (R qualifier) and not used.

The Navy's QA/QC program for laboratories is one of the most rigorous in the environmental field. Because all data is validated, more QA/QC issues tend to be identified than would be the case if less data were validated. The data are qualified as a result of these QA/QC issues; however, the fact that the data are qualified does not imply that they are not acceptable for use and interpretation. Due to their voluminous nature, the case narratives cannot be included in the RI report; however, they may be made available to the RAB technical subcommittee separate from this document upon request.

Data Presentation and Evaluation

11. **Comment:** **The depths of soil samples taken at IR Sites 12 and 17 are not defined in text with the chemical concentration of analytes. Description of both in text would be helpful since the discussion of the results is overly generalized and is not comprehensive to the point of defining the vertical and horizontal extent of contamination.**

    Response: The depths of the soil samples are presented in Addendum 2 and in the draft final RI report and each of the tables and figures that present the data identify the depths at which the soil was collected. The data are presented in tables and figures rather than in the text as this presentation is believed to provide a clearer and more reader-friendly picture of the horizontal and vertical extent of contamination.

12. **Comment:** **It would have been helpful to summarize the data obtained in the supplemental field work in concert with data obtained for either IR site for the Phase I and IIB work so that the site characteristics could be more comprehensively described.**

    Response: The data from the phase I and phase IIB investigations are presented in summary form together, with the additional investigation data in the draft final RI report. For Site 12, the results of the investigation are discussed in Sections 12.6.1 and 12.6.2 of the draft final RI report for soil and groundwater, respectively, and the data are presented in Tables 12-4 and 12-5 as well as on numerous figures.

13. **Comment:** **Section 3.2.1. Site 12 Soil Sampling Results. Were the motor-oil range petroleum hydrocarbons characterized by the off-site laboratory from the chromatograms? If so, copies of the chromatograms should be included in the appendix.**

Response: Yes, the motor oil range petroleum hydrocarbons were characterized by the off-site laboratory using chromatograms. The response to RAB comments on Addendum 3 provides a complete description of how petroleum hydrocarbons are identified by the laboratory. Copies of the chromatograms are too numerous to include in an appendix to the draft final RI report.

14. **Comment:** **Section 3.2.1. Site 12 Soil sampling Results. Are there any other choices for the association of the PAHs other than the petroleum hydrocarbons?**

Response: Polyaromatic hydrocarbons (PAH) are derived from coal tar. Besides being present in most petroleum mixtures, PAHs also occur naturally in soil, are present in burnt materials such as ash and soot, and are important for organic synthesis and chemical manufacturing. One PAH, naphthalene, is used for moth balls, fungicides, lubricants, preservatives, and textile manufacture. Because of the disposal areas at Site 12, there is a possibility that the presence of ash may be contributing to the PAHs detected, but the petroleum is still the most likely source.

15. **Comment:** **Section 3.2.2 Site 12 Groundwater Sampling Results. How was it decided that a concentration of below 1,500 ug/L was a "low" level for TPH-extractables?**

Response: The highest concentration of TPH-extractable detected during the additional characterization sampling at Site 12 was 1.5 mg/L (roughly, 1,500 µg/L). This concentration is considered a low level because it is below the TPH screening level of 14.3 mg/L. The TPH screening level was proposed by the Navy based on ecotoxicological testing of TPH and was used to evaluated all groundwater data in the draft final RI report. Development of the TPH screening level is further discussed in Appendix N of the draft final RI report.

16. **Comment:** **Section 4.2-Site 17 Groundwater Sampling Results. Define what is meant by a "low" level for VOCs.**

Response: A low concentration of VOC or any other groundwater contaminant is defined by comparison to the ambient water quality criteria (AWQC) for marine life. The AWQC values were established by EPA for the protection of marine life in surface water bodies. They are applied to all groundwater data from TI as an initial screen to identify potential groundwater contamination. Chemical concentrations in groundwater below the AWQC are considered low.

17. **Comment:** **Section 4.3.2 Evaluation of Contamination. Who determines and how is it determined that the plume of chlorinated solvents is "significant" or not? Please explain.**

Response: As discussed above, chemical concentrations in groundwater below the AWQC are considered low. The AWQC values are established by EPA. Their use and application in this situation was proposed by the Navy and agreed upon by the regulatory agencies. Since all of the concentrations of chlorinated solvents in the plume near Site 17 are below the AWQC, the chemicals in the groundwater do not pose a threat to ecological receptors and the environment. Therefore, the plume is not considered to be significant.

COMMENTS ON ADDENDUM 3: ECOTOXICOLOGICAL TESTING

Comments were provided by RAB members John Allman, Paul Hehn, and Usha Vedagiri. Comments that address similar issues have been combined.

1. **Comment:** **The very high percentage of qualified data in both the chemical analyses (holding times) and toxicity testing procedures (holding times, salinity, ammonia) seems to throw into question the accuracy and reliability of this entire task.**

   Response: Data qualifiers were assigned to the analytical results according to recommendations by the data validator using the U.S. Environmental Protection Agency (EPA) guidelines. Based on the severity of the quality control (QC) problems, data is considered either acceptable; estimated, but still acceptable for use; or rejected and unusable according to the following general principles:

   - No quality assurance (QA)/QC problems: Sample data are acceptable for use.
   - Minor QA/QC problems: Sample data are estimated (J qualifier) but acceptable for use; an example of a minor QC problem is a percent recovery of 64 percent that is outside the criteria of 75-125 percent.
   - Major QA/QC problems: Sample data are rejected (R qualifier) and not used.

   According to EPA guidance, while the qualified data add an uncertainty factor to the interpretation of the results, the exceedance of the suggested holding time by 1 to 2 days is considered a minor QC problem. The estimated data are still acceptable for use and should not affect their interpretation.

2. **Comment:** **Data Validation: Section 4.3 lists many problems with sample handling and preparation for several samples used in both bioassay tests. Making statements that the result of such QC problems is "unknown" or "is not expected to have had a significant impact on the sample toxicity" is not appropriate in my opinion, especially as concerns the elevated ammonia levels in two out of the three Site 12 samples, which caused these samples not to be used in determining the petroleum screening levels. As Site 12 is one of the most significantly contaminated sites on TI it is necessary that samples from it**

be included in determining appropriate screening levels. Since the screening levels arrived at in this report are to be used for establishing cleanup levels throughout Treasure Island (TI) it is extremely important that these analyses be carried out meeting all QC criteria, and therefore the bioassays should be redone accordingly. Even though additional contaminants, such as ammonia, make the data unusable for determining effects only of total petroleum hydrocarbons (TPH) on receptors, bioassays incorporating mixed contaminants would more realistically portray what effect these toxins will have on Bay receptors.

Response: As noted in the response to comment 1, a 1- to 2-day exceedance of the holding time is a minor QC problem. As a result, the data are considered estimated, but acceptable for use according to EPA guidelines. With respect to elevated ammonia and salinity levels in Site 12 samples, ammonia and salinity are naturally occurring and characteristic of the samples.

The Navy believes that QC criteria are a critical part of any project and that striving to meet the criteria is an important goal. However, the Navy believes that reanalysis of the bioassay samples would be of limited value given the expense of sample collection and analysis. Since minimal uncertainty is associated with the current data, it is unlikely that a reanalysis would produce significantly different results.

3. **Comment:** **The lack of relationship between chemical water quality and the toxicity tests (which is quite common) and the huge disparities in the results of the toxicity tests and they way the are eliminated or selected to estimate threshold values makes the screening levels of questionable value.**

Response: This comment raises two issues. First, although there seems to be some lack of correspondence between the chemical water quality data and the toxicity test data, the complex nature of the bioassay tests indicates numerous possible causes for the lack of correspondence. For example, the toxicity of selected samples might be explained by certain noncontaminant stressors or by synergistic effects between contaminants. Sections 4.3 and 5.2.1 of Appendix N in the draft final remedial investigation (RI) report discuss the possible origins of toxicity in the samples (primarily ammonia, salinity, metals, organic compounds, and TPH).

Second, the Navy agrees that the toxicity test results should not have been eliminated from the calculation of the TPH screening level based on exceedances of metal threshold values; species-specific toxicity levels were shown to be above AWQC as well as the levels in the samples for the bioassay species. The TPH screening value will be recalculated with the data previously eliminated once the Navy and the Regional Water Quality Control Board (RWQCB) select an appropriate data evaluation procedure.

4. **Comment:** **Page 25: A contaminant concentration exceeding the ambient water quality criteria (AWQC) does not automatically mean that it contributes significantly to toxicity. Also chemicals dropped due to blank contamination could have contributed to toxicity if present in the sample.**

Response: Again, this comment raises two issues. First, as noted above, the TPH screening value will be recalculated using all valid data collected for this investigation. Data should not have been eliminated from the calculations based on exceedances of AWQC values. AWQC are based on toxicological effects to a variety of aquatic receptors. Species-specific toxicity levels for the particular species used in the bioassays were found to be above the AWQC and the levels of metals in the samples. Second, while analytes qualified for blank contamination may contribute slightly to toxicity, it is unlikely. The analytes qualified as non-detected due to blank contamination were originally detected at concentrations below AWQC values, regardless of blank contamination. This indicates that the measured concentrations of these analytes would not have contributed to toxicity in the sample.

5. **Comment:** **Tables 5-6: It is very difficult to see any relationships between chemical concentrations and toxicities. By looking at the water quality associated with the most toxic and the least toxic samples (including a couple of the reference samples), it appears that gasoline, xylenes, total [polynuclear aromatic hydrocarbons] PAHs and nickel may contribute the most to toxicity, alone or in various unpredictable combinations. Because some of the lighter PAHs and other chemicals that are the most soluble, mobile, and toxic to aquatic biota are also often present in gasoline (e.g., naphthalene, phenos), the TPH component most involved in toxicity could be gasoline. Perhaps some of the chemicals reported as ND due to blank contamination could have had effects in the sample where blue mussel toxicity appears.**

Response: See responses to RAB comments 3 and 4.

6. **Comment:** **If the objective is to come up with an ecologically protective cleanup goal, I don't think it has been established that these groundwater values and soil values really will be protective. Also, since there are TPH products that are being dealt with, is there a strategy for addressing additives and impurities that may be ecologically toxic?**

Response: The objective of the ecotoxicological testing for TPH was to assess the toxicity of total petroleum hydrocarbons at Treasure Island and derive a TPH screening level based on the toxicity data. The strategy for addressing the toxicity of additives and impurities present in TPH is a related but separate issue. As discussed in Section 5.2 of Appendix N in the draft final RI report, it is not possible to separate the toxicity due to TPH from the toxicity related to all other impurities and additives in the soil sample. However, AWQC values can be used as a screening tool to identify the impurities and additives detected in the groundwater that pose a potential threat to ecological receptors in San Francisco Bay. This approach was used throughout the RI report and in Addendum No. 1.

The response to comment 3 further discusses this issue.

7. **Comment:** **Page 27. It is understandable that metal levels cannot be factored into TPH toxicity and cleanup up levels but how are metals and additives that may be part of the TPH product overall going to be addressed? e.g., lead and methyl tertiary butyl ether (MTBE). Was any effort made regarding MTBE, e.g. literature search for ecotoxicity of MTBE?**

Response: The response to comment 6 addresses the issue of metals and additives in TPH. No AWQC value and very little ecotoxicological data exist for MTBE. The TPH detected at Treasure Island was released to the soil and groundwater before MTBE began to be widely used as an additive in gasoline, so MTBE was not measured in the groundwater samples. However, as data for MTBE are collected in future investigations, some type of ecological screening value will be developed.

8. **Comment:** **Section 3.1.2.1. "Several metals exceeded ambient metals concentrations." (This comment also applies to discussion of other samples with mixed contaminants and high levels of metals, ammonia, etc.) Will a similar toxicity study be conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program for contaminants other than TPHs? Also will such studies incorporate the synergism of mixtures of contaminants, such as two metals with TPH's., etc?**

Response: Ecotoxicological testing to determine the toxicity of TPH at Treasure Island was performed for several reasons. Very little information regarding toxicity of TPH mixtures is available, and no ecotoxicological criteria have been promulgated by state or Federal agencies. TPH mixtures also experience weathering in the environment and degrade into different compounds than were originally released. The weathering process differs depending on the environmental conditions, so that the toxic effect levels of weathered TPH may not be equivalent from one property to another. This is not as common with other contaminants, and the effects of weathering on other contaminants are generally better understood. For CERCLA contaminants detected in the soil and groundwater at Treasure Island, information concerning their ecotoxicological toxicity is available, primarily through AWQC values, promulgated by the U.S. EPA. This information is used to evaluate the detected concentrations. Therefore, separate ecological toxicity tests will not be performed for other contaminants.

The methodology used for the ecotoxicological testing for TPH at Treasure Island does incorporate the synergistic effects of other contaminants, including metals. When a field sample that contains more than one contaminant is used in a bioassay, there is no way to separate the toxicity due to the TPH from toxicity caused by other contaminants present in the sample, such as metals. While this may complicate the derivation of TPH-specific toxicity levels, it does have the benefit of incorporating synergistic effects of other contaminants present at the sampled sites into the final toxicity level that is derived. Examination of the Treasure Island data shows that the average toxicity of the samples varied only slightly with the levels of metals found in the samples, and there was not a clear correlation between the presence of particular metals and increased toxicity in the samples.

9. **Comment:** **Pages 7-10: Providing the chromatogram, the Relative Carbon Number Index (RCNI) or whatever criteria were used to characterize the TPH fractions in the soil and eluate samples would help in determining if the reported fraction concentrations are reliable. What does "discrete peaks not indicative of fuel patterns" mean? Are these tentatively identified compounds (TIC) that couldn't be nailed down?**

Response: Petroleum fuels are identified using two complementary methods. First, the chromatographic pattern of the hydrocarbons in the sample is compared to the chromatographic pattern of a known fuel standard. The height and retention time of distinctive chromatographic peaks in the standard as well as the overall shape and retention time of the standard are used to identify the type of fuel present in the sample.

If the fuel does not match the pattern of any of the fuel standards analyzed by the laboratory, an identification of the hydrocarbons will be made using carbon-chain standards (similar to the RCNI). For the TPH-extractables analysis, a minimum of two carbon-chain standards (decane with 10 carbons and n-tricosane with 23 carbons) are analyzed as markers. All hydrocarbons detected between these two markers (C10 to C23) are identified as diesel range organics, regardless of the match between the standard and the sample discussed above. All hydrocarbons detected between C18 and C32 are identified as motor oil range organics. Similar identification rules are used for the TPH-purgeables analysis; all hydrocarbons detected between C4 and C12 are identified as gasoline range organics.

A "Y" qualifier indicates that the carbon-chain identification of the sample was used and the chromatographic pattern of the sample did not match the pattern of the standard fuel. A "Z" qualifier indicates that the concentration reported is due primarily to a single hydrocarbon compound. Since the TPH analytical method is not capable of identifying this compound, it is not considered a tentatively identified compound. However, a review of data from other analyses of the sample (volatile organics, pesticides, etc.) could provide information about the identity of this single peak hydrocarbon.

10. **Comment:** **Page 16. Are the blank action levels the same as the highest concentration seen in any blank or is the action level something else? Also, many of the chemicals that are reported as non-detects due to blank contamination or that affected quantitation limits are also quite ecotoxic, e.g., naphthalene, toluene, xylenes, cadmium, copper, lead, silver, etc. This could affect some of the unexplained toxicity in many of the toxicity testing results.**

Response: The blank action levels are either 5 or 10 times (depending on the analyte) the highest concentrations detected in any blank. Analytes that qualified for blank contamination may contribute slightly to toxicity, but it is unlikely. The analytes qualified as non-detected due to blank contamination were originally detected at concentrations below AWQC values (except copper and mercury in some samples), regardless of blank contamination. This indicates that the measured concentrations of these analytes would not have contributed to toxicity of the sample.

11. **Comment:** **Of the 6 samples selected for derivation of threshold values, three have nickel exceedances, one exhibits no toxicity at all, and one has a lead exceedance. The disparity in the data does not support their appropriateness for calculation of threshold values.**

Response: Based on discussions with the RWQCB and consideration of species-specific metals toxicity data, the Navy will recalculate the threshold values using all valid toxicity data without excluding samples with metal concentrations above AWQC. This comment is further discussed above in the response to comments 3 and 4.

12. **Comment:** **Why is the EC10 derivation based on averaging first across a site and then again across all samples? What is the purpose and significance? At the most, it could be one or the other.**

Response: Averages were calculated for each site to determine if a difference in toxicity would be observed at each site. Averages were calculated for all samples to determine a single threshold value. Future determinations of the threshold value will use a single average for all samples.

13. **Comment:** **Development of the screening level. The leachate factor derivation in Table 7-9 contain arithmetic errors. How was soil leaching factor determined? It seems inappropriate to use the leachate factor for diesel simply because it is in the middle of the range. The screening level should be selected on the basis of both prevalence and toxicity. So to be conservative, shouldn't the screening level take gasoline into consideration.**

Please explain how the equation "Petroleum Screening Level for Soil" gives a screening level of 430 mg/kg [milligrams per kilogram] for soil. 14.3 mg/L [milligrams per liter] divided by 3.3 = 4.3 mg/L. Please show all the steps in the calculation to achieve the 430 mg/kg soil result, as these steps were left out of the text and therefore leave the dimensional analysis unclear.

Response: A more detailed discussion of the calculation of the leachate factor is included in the draft final RI report (Appendix N). The explanation should clarify the calculation presented in Table 7-9. The leachate factor for diesel was an appropriate choice for calculation of the petroleum screening level for two reasons: (1) because diesel is the most prevalent form of petroleum at Treasure Island and, (2) because other studies have shown that diesel appears to be the most toxic form of petroleum to ecological receptors.

A calculation of the soil screening value assumes a conservative 1-to-1 correspondence between soil and water concentrations because the soil is in contact with the groundwater. Therefore, 14.3 milligrams per liter (mg/L) divided by 3.3 percent (0.033) times 1 liter per kilogram (L/kg) is equal to 430 milligrams per kilogram (mg/kg).

14. **Comment:** **Selection of test species. What is the rationale for the test species (purple sea urchin and blue mussel) selection? They are both approved West Coast testing species, among others, but why were these species selected for this task and these chemicals. In the portion of the Bay where TI is located there are several receptors which are likely to come into contact with contamination from the island. For example, why were bioassays not conducted on the following species: anchovies, Starry Flounder, Bat Ray, Japanese Littleneck Clam, Asian Clam, Zebra Mussel, and sea squirts.**

Response: The particular test species selected were requested by the Regional Water Quality Control Board (RWQCB) in order to collect data that would be comparable with results from TPH testing performed at other sites in the San Francisco Bay area. The purple sea urchin and blue mussel are species for which standard bioassay protocols have been developed, so that results from tests run for different sites are comparable. They are also known to be sensitive to petroleum contaminants, and are commonly used to evaluate the ecological effects of contaminants in San Francisco Bay. They were used to evaluate petroleum toxicity at the San Francisco International Airport, Hunters Point Shipyard, Point Molate Fuel Depot, and the Presidio. Use of similar bioassay protocols and species at all of these different sites allows the RWQCB to compare the resulting toxicity values and may enable them in the future to develop cleanup levels that are applicable to other installations, so that the site-specific testing will not need to be performed at each site with petroleum contamination.

15. **Comment:** **Bioaccumulation: Why was bioaccumulation not considered in determining petroleum screening levels. Although the study contends to determine screening levels based on bioassay results for the two considered species, other animals higher up in the food chain will bioaccumulate the contamination passed on to them while they eat other lower level organisms in the Bay. It needs to be estimated how the petroleum hydrocarbons will affect organisms higher up on the food chain or explained why it is not necessary to include these effects. I am looking for a scientific response to this question and I will not consider the answer "the regulatory agencies involved did not require us to do this" an adequate response.**

Response: The Navy recognizes the importance of bioaccumulation in evaluating the ecological risk of a contaminant. However, bioaccumulation was not considered for TPH because TPH is a complex mixture of different compounds which bioaccumulate at different rates. For this reason, the bioaccumulation potential for TPH as a mixture cannot be determined without a large amount of uncertainty. The main constituents of TPH are polycyclic aromatic hydrocarbons (PAHs) and the volatile compounds benzene, toluene, ethylbenzene, and xylenes (BTEX). The bioaccumulation potential of these compounds can be considered individually.

The purpose of this document is to establish screening levels for TPH as a mixture, rather than for individual TPH constituents. These constituents are considered separately in the human health and ecological risk assessments, and AWQC have been established for many of the individual PAHs, as well as BTEX.

According to Eisler (1987), "In general, PAHs show little tendency to biomagnify in food chains, despite their high lipid solubility, probably because most PAHs are rapidly metabolized." In documents by Environment Canada (1992, 1993a, 1993b) summarizing the effects of benzene, toluene and xylenes on human health and the environment, bioconcentration factors for toluene are reported as between 15 and 70, and as 80 for xylenes. Bioconcentration factors below 100 generally indicate that a compound is unlikely to undergo significant bioconcentration in organisms or biomagnification along food chains (U.S. EPA 1987, as cited in Environment Canada 1992). Also according to Environment Canada (1993a), "benzene does not bioconcentrate in aquatic biota to a significant degree." The individual constituents of TPH are not likely to bioaccumulate.

References:

Eisler, R. 1987. Polycyclic Aromatic Hydrocarbons Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review. Biological Report 85 (1.11), Contaminant Hazard Reviews Report No. 11. U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center. Laurel, MD.

Environment Canada. 1992. Toluene: Priority Substances List Assessment Report No. 4. Minister of Supply and Services Canada. Canada Communication Group - Publishing. Catalogue No. En40-215/4E. Ottawa, Canada.

16. **Comment:** **How will higher screening levels for inland sites be determined?**

Response: The petroleum screening level is the same for all sites regardless of proximity to the bay. The proposed screening level is only the first step in the evaluation process to identify sites contaminated by petroleum. A more complex evaluation will be conducted using cleanup levels determined individually for each site. Cleanup levels will be based on dilution attenuation factors which consider proximity to the bay as well as the hydrogeologic characteristics of the sites.

17. **Comment:** **Section 1.1, Approach, Purpose, and Application: "Alternatively if soil disposal was anticipated as part of a removal operation, soils could also be evaluated following dredge disposal guidance wherein preparation of eluates would be prepared following a less aggressive extraction procedure." Does this pertain to soil that is disposed of at another location on TI? If not, why would the toxicity of removed soils need to be considered, if all the contaminated soil is to be removed from the Island and therefore, will not enter the Bay.**

Response: The quoted sentence and the paragraph from which it was taken list three hypothetical examples to illustrate a situation in which a biological evaluation of contaminated materials would be conducted on different matrices. The proper evaluation technique depends partially on the remedial activity proposed for the site. With regards to the specific comment, the toxicity of the removed soil must be determined whether placed elsewhere on TI or disposed of off the island. Federal and state law both require that the impact of the contaminants on the proposed disposal site be evaluated, whether it is an operating landfill or an open-water dredge disposal site.

18. **Comment:** **Section 4.3.2, Echinoderm Abnormal Development Toxicity Test. Why was it necessary to run the bioassays concurrently at the expense of following prescribed QC criteria? The lab should have performed the analyses within the proper time frame for the results to be considered acceptable.**

Response: Although an uncertainty factor was introduced by holding eluate samples beyond the prescribed holding time, an advantage was gained by concurrently completing bioassays for multiple samples. Conducting bioassays concurrently reduces the amount of random error associated with tests in separate batches and ensures that test conditions are identical for all samples.

19. **Comment:** **Why were the additional soil samples collected as a backup control not tested for aquatic toxicity even when the initial control samples proved to be impacted?**

Response: The additional soil samples collected as a backup for the control samples were not tested for aquatic toxicity because they were contaminated by TPH at the same concentrations as the original control samples collected. The original control sample did not show any toxicity.

20. **Comment:** **Sample Collection: (1) Were any other alternative soil sample collection methods evaluated and considered in order to get enough soil sample from the proper depth to complete the analysis? (2) What was the depth to groundwater during the sample collection drilling? It appears that some of the samples may have been collected from below the groundwater level which would radically effect the overall results and outcome of the study. (3) If the borings were logged during the sampling events, the boring logs should be included with the report. (4) Why were the samples composited in the field instead of having the laboratory composite under controlled conditions?**

Response: A backhoe was considered to collect sufficient sample volume for this study, but was not used because of the difficulty in determining the exact sample location. Use of the Geoprobe for collecting samples allowed a more precise method of identifying the sample location.

(1) The depth to groundwater at most sites was approximately 8 feet below ground surface at the time of sample collection. Some samples were collected from below the water table; however, the effect on the overall results is expected to be minimal. The groundwater level fluctuations at Treasure Island can be as much as 4 feet, so much of the soil collected has previously been exposed to groundwater.

(2) Logging and characterization of soil collected from each borehole was not the primary purpose of the ecotoxicological testing investigation and the boring logs are not required for this report. The boring logs can be made available to interested RAB members on request.

(3) Samples were composited in the field for better control of the type of soil included in each sample. The goal of the sampling was to collect the highest concentration of TPH in soil. This was best achieved by selecting the most contaminated portion of the sample from the field. The samples were composited indoors, under controlled conditions.

21. **Comment:** **Soil Sample Results: (1) Include copies of the chromatograms used to evaluate the TPH results in the appendix of the report. For samples that had "discrete peaks not indicative of petroleum hydrocarbons" or for results "not qualified", what do these samples represent? (2) Were BTEX constituents detected for site 12. The Addendum 2 states that no volatile constituents were detected at the site. Which is correct? (3) The appropriateness of the ambient concentrations of metals in the artificial fill is still open to discussion and may not be correct. (4) Was the TPH-motor oil detected in the reference soil samples really motor oil or from the diesel?**

Response: (1) The response to comment 9 regarding the evaluation of chromatograms addresses this comment. Results that are "not qualified" are considered detected, with no associated QC problems.

(2) The draft final RI report states that benzene, toluene, ethylbenzene, and xylene (BTEX) constituents were detected in groundwater samples at Site 12 at concentrations below AWQC values for these constituents. BTEX was also detected in soil samples collected for the ecotoxicological study.

(3) Ambient concentrations of metals in artificial fill are based on samples taken from sites where there were no sources of metals. The Navy believes the concentrations established are accurate and appropriate.

(4) Motor oil in soil samples is the remaining weathered portion of diesel, or a similar petroleum fuel. For a further explanation of the Navy's approach to evaluating the chromotograms, refer to the response to comment 9.

22. **Comment:** **Eluate Sample Results: (1) When the TPH-purgeables or metals are detected above the quantitation limit, what happens to the results and testing of these samples? (2) The concentrations reported for TPH-extractables were concluded to be due to aged diesel. How was this determination established? If the results for TPH-extractables as motor oil were primarily due to diesel, is the same also true for other problems such as the interference with the immunoassay results reported to be from motor oil also really related to interference from diesel? (3) Why was the gasoline-spiked eluate samples not analyzed for TPH-purgeables?**

Response: The statement "detected above the quantitation limit" means that the analyte was a normally detected result and does not imply other meanings. The quantitation limit is a lower bound above which accurate quantitation of analyte concentrations is possible. When an analyte is detected above the quantitation limit, the result is considered accurate and acceptable.

(1) See response to RAB comment 9 regarding the evaluation of chromatograms. The question regarding interferences in the immunoassay samples is correct in part. For petroleum, the weathering process permanently changes the composition of the fuel and makes identification of the original composition difficult. The motor oil detected may have originally been diesel and in its present form may be interfering, to some extent, with the immunoassay results.

(2) The gasoline-spike eluate sample was planned as a supplemental analysis to assess the toxicity of unweathered gasoline. Unfortunately, because of an oversight at the laboratory, the analysis was not conducted. However, such an evaluation was not critical for developing TPH screening values because the TPH at TI has weathered.

23. **Comment:** **Analytical Modifications: Since both of the reference samples were impacted by petroleum hydrocarbons, there is no control sample for the procedures. Does this negate the results of the entire study or does it make the results less reliable? Also, should the areas from which the reference samples were collected now be investigated since they may also be impacted by petroleum hydrocarbons, especially near the school?**

Response: Although the control samples were contaminated by petroleum contamination, they did not exhibit toxicity. This information does not make the results less reliable. TPH concentrations detected in the samples collected from the two reference sites were all well below the petroleum screening levels established; therefore, the sites would not require additional investigation.

ADDENDUM NO. 4: REVISED REMEDIAL INVESTIGATION CONCLUSIONS AND RECOMMENDATIONS

Comments on Addendum No. 4 were received from RAB members Patricia Nelson, Paul Hehn, and John Allman. For the purpose of this response, comments that addressed similar issues were combined.

General Comments

1. **Comment:** **Whenever reference is made in this document to the fact that values for soil samples were determined to be above PRGs for various chemicals, but that the contaminants are not expected to impact ecological receptors in the Bay based on groundwater results, it must be remembered that geotechnical studies of Treasure Island (TI) have demonstrated that the island is slowly settling, *especially in the shoreline regions which this document focuses on.* Since the modeling results indicated in this report frequently predict Bay contamination several decades in the future, it is reasonable to assume that as the island settles the relative positions of contaminant plumes with respect to the water table may change significantly over time, thereby making any assumptions that highly contaminated soil has no chance of contaminating groundwater unreasonable. How was this settling effect reflected in the modeling calculations? If high levels of a contaminant are discovered in the soil, the complete extent should be determined and that soil should be removed.**

   Response: Although the settling was not directly considered in the modeling, slow land subsidence is unlikely to significantly influence the fate and transport of contaminants at NAVSTA TI. As discussed in the revised text of Addendum 1 (Section 3.2), conditions at NAVSTA TI favor the retention of many constituents (especially metals) in soils rather than their migration to groundwater. However, modeling was based on a worse case scenario by assuming the affected soils at each site are in direct contact with groundwater. Chemicals in groundwater were simulated to reside at the source continuously for long periods. Only sorption and dispersion were considered to reduce the concentration of a chemical as it migrates laterally to the bay. Other processes that take place at NAVSTA TI, such as chemical transformation, biodegradation, and dilution at the bay-groundwater interface, were not considered in order to increase conservatism of the screening-level modeling. Also, tidal fluctuations that increase vertical dispersion in contaminant plumes near the shoreline (and therefore, reduce concentrations in groundwater discharged to the bay) were not considered. The effect of these processes on fate and transport of contaminants at NAVSTA TI is expected to be much more significant than changes of "the relative positions of contaminant plumes with respect to the water table" due to a slow land subsidence.

2. **Comment:** **It is understood, from the RI Addenda No. 4 report, that the objectives of the work summarized therein were to revise the draft RI conclusions and recommendations for Installation Restoration (IR) Site Nos. 5, 7/10, 9, 11, 12, 17, 21, and 24. However, the technical basis for the revised conclusions and recommendations were described neither in a comprehensive nor a scientific manner but instead, were written in a narrative style which was difficult to follow.**

Response: Comment noted. The conclusions and recommendations presented in Addendum No. 4 followed the same format used in the draft RI report and were considered replacements for the corresponding sections.

Specific Comments

1. **Comment:** **There may be a relationship of soil and groundwater contamination between adjacent IR Site Nos. 5, 17, and 24. However, for IR Site No. 5 and 17 there are recommendations for no further action under CERCLA. These recommendations are irresponsible. Why not consider reviewing the data for all three sites and determine whether there is a relationship as part of the continuing work for IR Site No. 24? If appropriate, why not consider combining all three IR sites and address them systematically with IR Site Nos. 4 and 19?**

Response: IR Sites 05 and 17 are located cross-gradient from Building 99 at IR Site 24. (Building 99 is considered the likely source of chlorinated solvents contamination at Site 24.) Extensive sampling has been conducted at all three sites to delineate the extent of volatile organic compound (VOC) contamination in groundwater. The results of sampling at Sites 05 and 17 are presented in Addendum 2, "Additional Characterization at Sites 12 and 17." The results of additional sampling for VOCs at Site 24 has been recently presented in the "Site 24 Additional Characterization Summary Report." The field work for the Site 24 additional investigation was conducted in July 1997. Sample results show that the VOC plume at Site 24 emanates from the eastern portion of Building 99 and extends downgradient (to the east). The VOC plume at Site 24 is separate from low concentrations of VOCs detected in groundwater at Sites 05 and 17.

Total petroleum hydrocarbon (TPH) data at Sites 05 and 17 indicate the fuel line and aboveground storage tanks (AST) are the areas of highest TPH concentrations. These features are in the central portion of both sites. Monitoring well 17-MW01, located downgradient of the ASTs, contained detectable TPH concentrations in one of four samplings. To verify the lack of TPH groundwater contamination cross gradient (toward Building 99), a groundwater sample was collected for TPH analysis during the Site 24 additional investigation at a boring location on the south side of Building 99. TPH was not detected in the sample.

2. **Comment:** **The revised conclusions and recommendations were based on data generated for the RI report and fate and transport modeling results which contain fatal flaws (refer to my comments on the RI dated January 17, 1997, and those above for Addenda No. 1). Therefore, it is recommended that the analytical data and fate and transport modeling analyses be reviewed for technical validity by regulatory agencies on the RAB and the Navy prior to decisions being made regarding whether no additional work under CERCLA for certain sites (e.g., IR Site No. 5) is appropriate. In addition, it is recommended that analytical data for the IR sites that were transferred to the corrective action program (CAP) program and are adjacent to IR sites for which additional work under CERCLA is recommended (e.g., IR Site No. 6) be reconsidered as IR sites until valid data and fate and transport modeling work for NSTI are prepared.**

Response: The regulatory agencies reviewed the fate and transport modeling procedures and agreed that overall assumptions applied to the models appeared to be reasonably conservative to ensure that concentrations would not be underestimated at the point of discharge to the bay. The Navy's response to RAB comments on Addendum No. 1 explains the Navy's modeling approach in detail.

3. **Comment:** **Section 2.1, Site 05, Old Boiler Plant: Just because the high source of beryllium in the soil is unknown at this site, this does not preclude the need for it to be removed from CERCLA. How can it be transferred to the petroleum program? The conclusions that mercury is not an ecological contaminant of concern (COC) does not address the human health risks associated with the mercury nor have the potential future reuses been addressed for the site. The no action conclusions for the CERCLA issues for soil and groundwater do not address future uses of the site. The metal-contaminated soil should be removed in the event that the island settles and permits the contaminated soil to interact with the groundwater in the future.**

Response: A baseline human health risk assessment (BHHRA) was conducted for Site 05, as described in Section 7.7 of the draft final RI. Beryllium and mercury were identified as human health chemicals of potential concern (COPC) by the BHHRA at Site 05. Mercury was not, however, identified as a human health chemical of concern (COC). COCs are chemicals that contribute most significantly to an exceedance of the target level. Beryllium was identified as a human health COC for the residential land use scenario only. (Commercial/industrial and recreational land-use scenarios were also evaluated.) The source of elevated concentrations of beryllium in soil is unknown and is not associated with the petroleum releases at the site. Beryllium has a large Kd (sorption coefficient) that is an order of magnitude higher than that of mercury. Thus, beryllium tends to be strongly sorbed to soils and is unlikely to migrate. Screening-level fate and transport modeling showed that mercury is not an ecological COC.

As noted, all possible future users of TI were evaluated in the BHHRA. Furthermore, while beryllium was identified at Site 05, it is above levels that would require action only under a residential use scenario; however, the City of San Francisco plans Site 05 for commercial use. Issues regarding settlement of the island are addressed in the response to comment 1, under general comments above.

4. **Comment:** **Section 2.2, Site 07/10, Pesticide Storage Area/Bus Painting Shop: The conclusion that the former sludge disposal area is currently covered by new equalization basins does not adequately consider potential reuses of the site. Were either soil samples taken before construction to show the extent of MCPP contamination? Was the excavated soil analyzed for herbicides during construction? Which specific exposure pathway is incomplete? Direct contact with the soil is prevented where the basins are located, but how does the presence of the basins preclude exposure of the herbicide to groundwater.**

Response: MCPP (2-[2 methyl-4-chlorophenoxy] propionic acid) was detected in only one soil sample collected prior to basin construction, from boring 07-SB03. MCPP was not detected in soil samples from this boring collected at 1.1 to 1.6 feet below ground surface (bgs) and 6.5 to 7.0 feet bgs. MCPP was also not detected in nearby boring 07-SB04. The area around boring 07-SSB03 is covered by the new equalization ponds for the wastewater treatment plant. Soil excavated for construction was apparently not sampled. MCPP was not detected in groundwater at Sites 07 and 10.

5. **Comment:** **Section 2.3, Site 09, Foundry: Based on the previous debates concerning the validity of immunoassay results, I suggest that samples be taken and sent to an offsite laboratory to confirm that the TPH had not migrated from the trench area. The source of the elevated concentration of lead may have somehow originated in relation to the skeet shooting range located near Site 09.**

Based on previous comments concerning the settling of TI, it would be prudent to remove the beryllium-containing soil as well as the lead-affected soil, as well since it has been identified.

Response: The Navy has collected four quarters of samples from monitoring well 09-MW01, located downgradient of the lift. TPH-extractable concentrations ranged from nondetect to 280 micrograms per liter (μg/L). Hydraulic punch groundwater samples were collected in four locations at this site. TPH-extractable concentrations ranged from nondetect to 780 ug/L. These results are based on laboratory analysis. Concerning the source of the lead, Site 09 is located approximately 700 feet from Site 27. Given this distance, it is more likely the lead has resulted from activities related to Site 09.

Regarding beryllium and lead and settling of TI, see response to general comment 1.

6. **Comment:** **Section 2.4, Site 11, Yerba Buena Island Landfill: Conclusions on this site should not be reached at this time since the investigation of impacts from the landfill are not complete.**

Response: The Site 11 investigation was based on the U.S. EPA's presumptive remedy for landfills, which assumes a cap will be installed over the landfill. Therefore, the horizontal extent of the landfill should be determined, but the contents of the landfill do not need to be characterized.

7. **Comment:** **Why is the site not being further evaluated for use by harbor seals which haul out on the south edge of Yerba Buena Island, in addition to use by peregrine falcon.**

Response: The harbor seal haulout is on the western side of YBI and not near Site 11; therefore, this issue was not addressed.

8. **Comment:** **Site 2.5, Site 12, Old Bunker Area: The addenda reads "Conservative screening-level modeling showed that fluoranthene, phenanthrene, endrin, hetachlorepoxide, aroclor-1254, arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc, in groundwater at Site 12 are not expected to reach the shoreline at concentrations exceeding the AWQC." Again refer to the general comments concerning the settling of TI where this vast list of contaminants may come into greater contact with groundwater in the future and find their way to the Bay.**

The addenda reads "A potential source for the metals could be the disposal activities that occurred at the site and the artificial fill of which TI is composed." I object to the argument of the artificial fill contributing high levels of metals to Site 12, unless it can be demonstrated that other filled sites on TI also contain high levels of these same metals.

Response: Regarding settling of TI, see response to general comment 1.

The Navy was not implying that the artificial fill is the sole source of metals detected at Site 12, but it is one potential source. Since the source of fill material varies, other fill sites may exhibit ambient levels of metals different from those at Site 12.

9. **Comment:** **Section 2.6, Site 17, Tanks 103 and 104: Again, the question regarding settling of TI, the VOCs may come into greater contact with groundwater in the future and find their way to the Bay. What is the timing for the removal of the tanks for this site? Completion of the investigation at this site must await the removal of the tanks.**

Response: See response to general comment 1.

Progress at the site should not be delayed because the tanks still remain. The Navy assumes that soil and groundwater are contaminated beneath the tanks and that the tanks will be removed. The appropriate remediation method can be evaluated and selected using the present information.

10. **Comment:** **Section 2.8, Site 24, Dry Cleaning Facility: The conclusions suggests that there are impacts from PCE [tetrachloroethene], TCE [trichloroethene], and petroleum hydrocarbons. This represents a mixed plume that should be investigated and managed under the CERCLA program. It has been suggested that the petroleum hydrocarbons be managed under the UST [underground storage tank] program. Splitting the site between the two programs would not be a good idea since it makes it much more difficult to manage and coordinate between two programs and two managers.**

Response: The area and media contaminated by petroleum hydrocarbons focus around the fuel lines and are not in close proximity to the groundwater containing PCE and TCE; therefore, they are unlikely to be commingled plumes. Site 24 has been divided into 24A and 24B in the draft final RI. The portion of Site 24 that includes the dry cleaning operations in Building 99 is designated Site 24A. The portion of Site 24 that includes the abandoned underground fuel pipelines near 5th Street is designated Site 24B. The area contaminated by petroleum hydrocarbons (Site 24B) is not in close proximity to groundwater containing PCE and TCE (Site 24A). Site 24B will be investigated as part of the fuel line removal program.