



# Department of Toxic Substances Control

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HUNTERS POINT  
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Attention: Richard Mach

## PARCEL D SOIL SITE DELINEATION, DRAFT SAMPLING AND ANALYSIS HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

The Department has completed its review of Draft Sampling and Analysis Plan (SAP), the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPP), Parcel D Soil Site Delineation, Hunters Point Shipyard, San Francisco, California. The documents (dated August 24, 2000) were enclosed in the same binder, and are all together considered as a single document for the purposes of this review. The documents were prepared for the Department of the Navy, Southwest Division, Naval Facilities Engineering Command (Navy) by Tetra Tech EM Inc.

It is our understanding that these documents are companion documents to: Draft Final Action Memorandum, Time Critical Removal Action for steam Lines, Fuel Lines, and Non-VOC [volatile organic compound] Soil Sites at Parcels C and D, Hunters Point Shipyard, San Francisco, California (dated July 31, 2000), with respect to non-VOC sites at Parcel D only.

### General Comments

1. Secondary document. The SAP, FSP, and QAPP are secondary documents according to the Federal Facilities Agreement (FFA). Approval of these secondary documents by DTSC is not required. However, DTSC's comments are provided to the Navy with the hope that any differences can be resolved at this stage of the process. Pursuant to the FFA, DTSC has the right to dispute in subsequent primary documents.

2. Field sampling strategy (FSS) and consistency. For the sake of consistency and expediency, DTSC recommends that the FSS for Parcel B be used for Parcel C and D sites. It is not clear why a different FSS is warranted for this subset of non-VOC sites on Parcel D.

The documents under review (SAP, FSP, and QAPP) address only several sites identified by the Navy as non-volatile organic compound sites (non-VOC sites). The field sampling strategy proposed is different from the field sampling strategy for Parcel B that very recently was discussed among the agencies and the Navy. Considerable time and effort was exerted during the discussions on the field sampling strategy for Parcel B, including invocation of informal dispute resolution. Pursuant to those discussions, the Parcel B FSS should be regarded as the template. Where changes to the template are appropriate, the Navy should provide an explanation for the changes proposed. For example, for fuel lines and steam lines, since they are lineate features, an adaptation of the FSS is appropriate. More detailed comments on the FSS are provided below, particularly in FSP Comment 2.

Please note that it is DTSC's position (as stated previously during the Parcel B FSS discussions), is that DTSC will review the complete data set upon receipt of the field report(s) to determine whether sites have been adequately characterized or whether additional data gaps need to be investigated.

3. Quality Assurance Project Plan (QAPP). DTSC recommends that one comprehensive QAPP be submitted by the Navy for all sites in Parcels C and D. For example, on Parcel B, one comprehensive QAPP was submitted. The QAPP should include all compounds included in the Parcel B QAPP, including petroleum compounds, and any additional compounds (if any) detected on Parcels C and D. The QAPP should include screening criteria for all compounds (including petroleum compounds), and detection limits (DLs) and other quality assurance/quality control (QA/QC) parameters for all compounds. This work has already been completed in the Parcel B QAPP and can be re-submitted under new title as the QAPP for Parcels C and D, with minor revisions as appropriate. If minor revisions are proposed by the Navy, these should be explicitly called out in the cover letter.

The proliferation of QAPPs is non-efficient and costly to review. Moreover, the QAPP submitted here does not suffice. More detailed comments on the QAPP are provided below.

4. Assumptions of the risk management review (RMR) process. The objective of the risk management review process for Parcels C and D was to make recommendations regarding whether sites identified in the feasibility studies (FSs) should proceed to remedial action or whether the sites could be considered as no further action (NFA) sites, based on a re-evaluation of the site data. FS sites were re-evaluated if the risk assessment had indicated excess cancer risks (ECRs) of  $10^{-6}$  (or greater) or hazard indices (HI) of 1 (or greater). During the RMR, factors considered included: exceedence of United States Environmental Protection Agency's (USEPA's) preliminary remedial goals (PRGs) for 1998 and 1999, the adequacy of the site characterization, and the volume of contaminated soil.

With regard to cleanup scenarios, DTSC's comments on the Parcel D RMR (dated October 5, 1999) were limited to recommendations regarding the industrial scenario only. Subsequently, recommendations for residential scenario were provided for RA 37-1 and RA 37-2 (various meetings and memo: August 4, 2000). In these comments, the residential scenario is considered only for IR-37 (RAs 37-1 and 37-2, and de minimis (DM) sites 6671 and 6771).

With regard to compounds of potential concern (COPCs), identification of specific COPCs for each site was not a stated objective of the RMR process. That is, COPCs have not been agreed upon. In this review, the data set for each site will be evaluated, COPCs will be identified and DTSC's recommendations for analytical methods for each site will be provided. (See General Comment 8 and specific comments for each site).

Cleanup goals (Appendix C and QAPP Appendix 1) for some compounds (e.g., polychlorinated biphenyls (PCBs) and arsenic), are slightly more stringent than the screening criteria used in the RMR process. For example, the PCB criteria decreased from 1.3 to 1.0 mg/kg (industrial scenario), chromium VI decreased from 64 to 10 mg/kg, and arsenic decreased from 22 to 11 mg/kg.

With regard to impacts on natural resources, the SAP, FSP and QAPP should state explicitly that groundwater, surface water, and ecological concerns were not addressed during the risk management review process for Parcel D and that recommendations for remedial actions were based on human health risks only (with groundwater exposures excluded, pending resolution of the beneficial uses issues). It is DTSC's understanding that potential threats to groundwater will be

handled in a separate effort by the Navy.

Contamination by total petroleum hydrocarbons (TPH) was not evaluated during the RMR process, since it was assumed that sites contaminated only with TPH would be remediated under the Regional Water Quality Control Board's (RWQCB's) Corrective Action Program (CAP). However, the presence of TPH did influence DTSC's recommendations. For example, when polyaromatic hydrocarbons (PAHs) were associated with TPH, a potential for contaminant migration and/or areal extent was assumed and further action was recommended.

5. Data Quality Objectives (DQOs). For the sake of consistency and expediency, the DQOs proposed for Parcel B should be used for Parcels C and D. It is not clear why different DQOs are warranted for this subset of non-VOC sites on Parcel D.

The DQOs for Parcel B have only recently been discussed at length between the Navy and the agencies. Those DQOs represent the outcome of an iterative process and they have improved as a result of the process. The DQOs for Parcel B were considered appropriate for all sites on Parcel B. Separate DQOs were not proposed for non-VOC sites in Parcel B, and separate DQOs are not necessary (and may not be appropriate) for subsets of sites on Parcels C and D.

The DQOs for the documents currently under review are less stringent than those for Parcel B. For example, petroleum screening criteria was added to the DQOs for Parcel B after considerable discussion. But the petroleum screening criteria have been taken out of the DQOs for the documents under review. Similarly, VOCs were removed from the DQOs. DTSC recommends that petroleum screening criteria and VOCs should be included in the DQOs for Parcels C and D.

6. Relationship between this SAP and the TCRA

6.1 Nomenclature: "non-VOC" sites.

The Navy should indicate how sites are designated as non-VOC sites. What rules apply? The Navy should discuss why designating a site as a "non-VOC" site is necessary. The following paragraphs discuss some concerns regarding the "non-VOC" designation.

On page 2, first paragraph, the text says: "This approach will be also applied to any additional non-VOC soil sites that may be added to

the 13 sites listed above as a result of the aboveground storage tank (AST) and underground storage tank (UST) removals and the steam line removals at Parcel D.” (emphasis added). The statement is confusing since it says that this SAP will apply to only some new sites that may be identified during the TCRA work. That is, the statement says that the draft FSP and QAPP will apply to the non-VOC sites. VOCs are likely to be encountered during fuel line removals and during steam line removals (since steam lines have been used to carry waste oil) and for fuel and steam line work that crosses VOC sites. How will it be determined that a site is a VOC/non-VOC site? And how will it be determined which SAP, FSP, and QAPP will apply to new sites?

This statement is also confusing since fuel lines have been left out of the statement. Are new sites discovered during fuel line investigations automatically assumed to be not non-VOC sites? How will new fuel sites be discovered or extended if TPH is not included as an analyte for fuel sites (see DTSC’s comments on Parcel B Draft Amendment Appendices 5 and 6)? How will the risk associated with fuel components be assessed if fuel components (e.g., phenanthrene) are not included as analytes? How will it be determined that fuel line sites are or are not non-VOC sites?

All non-VOC sites are not addressed by the documents under review. Other non-VOC sites in Parcel D have been investigated or remediated under other documents—for example, in construction summary reports. And, some sites are located under buildings, and the remedial action may involve institutional controls (IC). The investigation of such potentially IC sites is hampered by the site conditions. Are IC sites considered to be VOC sites, or non-VOC sites, or some other category? Where will these sites be addressed?

When VOCs have been detected in the groundwater, but soil sources have not been identified, it is potentially misleading to designate such sites as non-VOC sites. That is, future investigations (e.g., soil gas surveys) may lead to the discovery of VOC soil source(s).

In summation, DTSC notes that the nomenclature “non-VOC” sites is confusing and potentially misleading because of the complications stated above. Use of the term “non-VOC sites” should be discontinued. The Navy can propose sites for removal actions on a site-by-site basis (that is not as a group called “non-VOC sites”). To facilitate review, a tracking matrix is requested (comment 7 below).

6.2 DTSC has previously commented (letter dated August 21, 2000)

that the TCRA is not complete. For example, an FSP, a QAPP, an HSP and a workplan should be provided for all TCRA sites (including fuel line sites and steam line sites).

As previously noted, DTSC recommends that the FSS, the QAPP and the DQOs should be consistent for all sites (to the extent that this is reasonable).

7. Tracking matrix. To facilitate review and in order to keep track of all the sites, a matrix should be provided which lists all sites in Parcels C and D and the Navy's approach to the sites (e.g., removal action (RA), exploratory excavation (EE), no further action (NFA)). The matrix should include both Parcel C and Parcel D, since some SAPs, FSPs, QAPPs, and workplans apply to both parcels. The matrix should be included as an appendix to the QAPP(s). All sites in the FSSs should be included. It should be treated as a living document, and new sites should be added as they are discovered. The documents pertinent to RAs and EEs for each site should be referenced ( e.g., CAP, fuel line, EE report, construction report). For example, the matrix should indicate which sites are referred to the RWQCB's CAP. Dates of removal actions should be included. The applicable SAP, FSP and QAPP for each site should be noted.

8. Health and Safety Plan (HSP). Section 6 of the FSP refers to the 1996 basewide HSP. It also says that: "The samplers will be provided a copy of the HSP for this project." Does this mean that a project-specific HSP exists? If so, a copy should be provided with this SAP, FSP and QAPP.

Are all the activities of the TCRA addressed by the HSP, including cleaning and handling of lines, excavations (including confined space), backfilling, segregating/handling/disposal of various kinds of waste, various sampling and drilling techniques, etc.?

9. Compounds of potential concern (COPCs). The Navy uses the terms "target analyte" or "compounds of potential concern" (COPC) to refer only to those Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) compounds which have exceeded screening criteria. This is too limited an interpretation of the term "COPC" and an inappropriate use of the term "target analyte".

The Navy's definition of COPC is too narrow. DTSC recommends using the term COPC when: 1) Compounds are measured at concentrations exceeding cleanup goals or total petroleum hydrocarbon

(TPH) screening criteria. 2) There is a potential for cumulative risks above an ECR of  $10E-6$  or  $HI = 1$ . 3) When compounds occur in suites, the suite should be identified as COPCs. For example, a suite of PAHs will be identified as COPCs. Similarly, metals can be identified as a suite of COPCs (e.g., when sandblasting is associated with a site). 4) Breakdown products of COPCs are included as COPCs. For example, breakdown products of volatile organic compounds are included as COPCs even when they have not exceeded screening criteria.

Target analytes. In lieu of the term "COPCs", the Navy sometimes uses the term "target analytes". Use of the term "target analytes" in this context is discouraged since it has another meaning in a different context. That is, target analytes are those compounds that an analytical method is able to measure within quality assurance parameters. The usual procedure is that a COPC is identified and then the method that contains the COPC as a target analyte is specified in the sampling plan. In these documents, the Navy should identify COPCs and then specify appropriate analytical methods which contain the COPCs as target analytes. Results for all target analytes of a method (including COPCs), and all tentatively identified compounds (TICs) of the method, should be reported: this is a standard requirement which is in the QAPP (page D-6). Laboratory reports (hardcopy) should be included in the document which summarizes the field investigation.

To summarize, the phrase "target analyte" should be replaced with "COPC" in the documents under review, and in subsequent documents submitted by the Navy. The term "COPC" should be defined as per these comments.

Waste characterization. Waste characterization results may indicate additional COPCs. Waste characterization results should be included in the document which summarizes the field investigation. Any exceedences of cleanup criteria in waste profiling results should be discussed in the text of the report which summarizes the field work. New COPCs identified through waste characterization results should be discussed with the Base Realignment and Closure Team (BCT).

10. Detection Limits (DLs). The Navy should identify sites where previous samples had detection limits greater than the cleanup goals. If compounds cannot be ruled out because detection limits were too high, the compounds should be retained in the analytical program for pre-excavation sampling and post-excavation sampling.

11. Sampling of excavation floors (aka bottom sampling). At a minimum, sampling of excavation floors (and sidewalls) should be consistent with the agreements of the Base Realignment and Closure Team (BCT) regarding Parcel B sampling. The agreements reached in the informal dispute resolution process are summarized in an email from Richard Mach pursuant to the conference call of August 3, 2000. This email says that: "The Navy is working to incorporate these same issues into the Parcel D SAP, which is scheduled to be submitted to the BCT..." However, the documents under review are not consistent with these agreements. More detailed comments are provided below (FSP Comment 2.2.2).

12. Relationship between SAP, FSP, and QAPP. General comments previously made by DTSC pertaining to the relationships between SAPs, FSPs, and QAPPs apply to the documents under review, and are not repeated here.

The reports under review represent a general improvement over previous reports. The Navy has been responsive to some of the previous comments. For example, figures indicating sampling locations have been moved from the QAPP to the FSP for these documents, as requested.

In other cases, the Navy has not been responsive. For example, DQOs are not included in the FSP. Another example--DTSC requested that site specific sampling procedures should be described in the FSP. However, the Navy has included Tetra Tech's standard operating procedures (SOPs). The SOPs contain general procedures which do not apply in toto to the work proposed, and hence are not wholly appropriate. Appropriate sections should be excerpted into the text of the FSP.

The relationship between the SAP and the FSP is not clear: the scopes of the documents overlap considerably. The two documents should be combined.

The first sentence of the FSP: "This field sampling plan (FSP) and the accompanying quality assurance project plan (QAPP) comprise the sampling analysis plan (SAP) for soil site delineation activities at Parcel D". This statement doesn't acknowledge the existence of the document entitled "SAP" which is the first document in the binder. However, if the SAP and the FSP are combined, as recommended in the last paragraph, this is a moot point.

An introductory statement regarding the relationships between the

documents (including the TCRA) should be added to the QAPP.

13. Workplan for excavations. A workplan detailing the actual excavation work has not been submitted by the Navy. When is such a document to be expected?

Regarding workplans, comment 8 from DTSC's comments on the TCRA is reproduced here, for your convenience. In addition, procedures for cleaning and handling fuel and steam lines should be described.

"Section 5.1.1: Proposed Action Description. This section should contain a description of the techniques and methods to be used. These include (but are not limited to): excavating (slopes, confined spaces, shoring, dewatering), storing (storage location, bins (covered/lidded), piles, etc.), handling (soil, surface water and groundwater, tanks), treating (dust control), transporting (number of trucks/railcars, routes of transportation), utility clearance, site security, traffic, backfilling (what is "clean" backfill), soil compaction (size of lifts, subgrade level, paving areas to 95% relative density as per ASTM Method D-1557, landscaping areas to 90%, topsoil?), air monitoring, dewatering, site restoration, mobilization/demobilization, permits required (if any), site surveying and disposing of materials (soil, water, PPE, debris) should be discussed. Disposal sites and analytical laboratories should be identified. Soil and groundwater sampling methods should be briefly discussed. Decontamination procedures and staging areas should be described for all tools and equipment.

Excavation drawings should be provided for standard excavations, confined space excavations, shored excavations, and excavations adjacent to buildings. Will the excavations encounter streets, sidewalks, utilities or rail lines? If so, a description of the methods to be used for excavation under these features should be included. Excavations that may impact structures need to be under the supervision of a licensed professional engineer.

How will excavations be dewatered? What procedures will be in place to ensure that contaminated groundwater is properly handled? What procedures will be used to ensure that dewatering will not cause migration of contaminated groundwater?

Post-construction submittals should be described, and schedules provided."

14. Logging. Interpretation of results from some previous excavations have been hampered by paucity of detail in the records of the excavations. To ensure against re-occurrence of this problem, soil cores should be logged and photos and/or drawings of the excavations (including all sidewalls) should be made in the field, with sampling depths and locations clearly indicated. The area associated with composite samples should be clearly noted.

Locations of field indicators of contamination (e.g., sheen, odor, greasiness, discoloration, debris) should be noted in field logs, which should be included in the summary report for this investigation.

15. Criteria. The cleanup goals in this report are more stringent in some cases than the screening criteria used in the RMR process--for example (industrial scenario), for polychlorinated biphenyls (PCBs: reduced from 1.3 to 1.0 mg/kg), chromium VI (64 to 10 mg/kg), and arsenic (22 to 11 mg/kg). For this report, the data for each site included in this report are compared to the industrial cleanup goals and comments are provided regarding exceedences that may not have been exceedences in the RMR process. However, for sites not included in this report, no re-evaluation of the data was conducted.

Please note that PAH residential cleanup goals (e.g., .33 mg/kg for b(a)p) are set at about 5 times the 1999 residential PRGs for PAHs (e.g., .062 mg/kg for b(a)p), and as such represent some risk greater than 10<sup>-6</sup>.

## **Specific Comments**

### **Sampling and Analysis Plan (SAP)**

#### 1. Title.

The title of the document (Draft Sampling and Analysis Plan Parcel D Soil Site Delineation...) is inaccurate since it could be interpreted to apply to all sites in Parcel D. It should also include the term "Time Critical Removal Action". The title should be changed to reflect the stated limitations of the documents--i.e., that the documents apply to specific areas of Installation Restoration (IR) sites. Page 1 says that the SAP applies to: "specific areas within these IR [Installation Restoration] sites: remedial area (RA) 8-1, RA8-2, RA 37-1, RA 37-2, de minimis (DM) 6864, DM 6965, DM 6967, DM 7167 (IR37SS08), DM 6771, DM 8866, DM 10676, and DM 11260."

Also, according to the TCRA, additional sites in Parcels C and D may be added if they are discovered during steam line, AST or UST investigations (General Comment 5). The title should reflect this possibility.

2. Signatory. Provide (on the title page and approval pages) the registration number for the California registered geologist who is signing the report(s):
3. Additional sites. This SAP does not contain site-specific information about all sites for which it potentially applies. That is, new sites discovered during investigation of TCRA sites may be added. Page 2 says that addenda to this SAP which contain site specific information will be provided by the Navy. The format and contents of such addenda should be discussed with the agencies.
4. Acetate liners (with samples with end caps) are proposed as sample containers (page 2 and FSP page 4). A sentence should be added explaining that where sampling for VOCs or TPH-e is warranted, Encore samplers will be used, as per Appendix C.
5. Cleanup goals (page 3, first paragraph). Cleanup goals should be discussed in the text and included as a table in the SAP (and the FSP). Reference to the TCRA is insufficient. A comprehensive table of cleanup goals for Parcel D is included as Table C-2 in FSP Appendix C (and QAPP Appendix 1). This table should be moved into the SAP and moved to the front of the FSP (not included as an appendix). The text should state that the residential cleanup goals are identical to those of the Parcel B Record of Decision (ROD) Explanation of Significant Differences (ESD). The date of the ESD should be included. The text should explain the source of the industrial cleanup goals--for example, the USEPA's industrial 1999 PRGs. If there are compounds for which the industrial cleanup goals are different from the PRGs, the exceptions should be called out and explained.

The RWQCB's petroleum criteria should be included and discussed in the text.

The Navy should provide an explanation or more clarification for Footnote h (Table C-2 in FSP Appendix C and QAPP Appendix 1), regarding cadmium--since this footnote did not appear on the ESD. That is, Footnote "h" seems to cite a cleanup criteria for cadmium (1000 mg/kg) that is different from the industrial cleanup goal of 810 mg/kg on the table.

Any other changes from the ESD should be discussed in the text.

Regressions for metals (Footnote i of Table C-2 in FSP Appendix C, and QAPP Appendix 1). Graphs showing the regression of chromium against magnesium and the regressions of nickel against magnesium and cobalt should be provided, as illustrations of the cleanup goals for these metals. The formulas for the regressions should also be provided.

A footnote should be added to Table C-2 in FSP Appendix C (and QAPP Appendix 1) indicating that the cleanup goals (with the exception of the petroleum criteria) are from the Parcel B ROD 2000 ESD, and that the petroleum criteria have been provided by the RWQCB.

6. FSS (page 3, paragraphs 3 and 4, and Figure 2--also FSP pages 3 and 4 and QAPP Table A-2). As noted above, the FSS should be changed to be consistent with the FSS developed for Parcel B (General Comment 1) and should be consistent with the dispute resolution summary email for Parcel B (General Comment 10). For example, the maximum depth of floor samples should be stated as 10 feet below ground surface (fbgs), not 9 fbgs, to be consistent with Parcel B FSS.

The statements: "The samples collected from each soil site will be analyzed for only the site-specific contaminants that exceeded the soil cleanup goals" (emphasis added) and "the target analytes will be those that exceed the cleanup goals" are not acceptable and should be deleted (see General Comments 3 and 8). All the method analytes will be measured by the lab and a request to report only the Navy's designated "target analytes" may result in withholding of information at the laboratory.

More detailed comments on the FSS are provided below in FSP Comment 2.

7. Reuse designations (Figure 1). Some areas on the figure are not clearly designated as to their reuse. For example, areas currently occupied by streets are not designated. All areas of the site should be designated. It was DTSC's understanding that the Navy and the City of San Francisco (City) were meeting to resolve this issue.

It is DTSC's position that sites should not be split into different cleanup scenarios. For example, site RA37-2 extends from a residential reuse area through an undesignated area into industrial reuse area. Which cleanup goal will apply to this site?

The Navy should provide a table indicating the reuse designation and the cleanup scenario (residential or industrial) that applies to each site. It is necessary to clarify these issues prior to remedial action. Also, it is possible that some sites will extend from the current designation into a different designation as the removal proceeds. What rule will apply under such circumstances?

After the Navy and the City have resolved these issues, Figure 1 should be changed accordingly and the approach should be discussed in the text.

8. IR site figure. A figure should be included which depicts all the IR site boundaries in Parcel D.
9. Other sites (text page 1, Table 1, Figure 7). Some sites included in the FSP are not included in the SAP. For example, de minimis (DM) site DM 9686 and new DMIR08B022 are included on Figure 1 of the FSP but are not in the SAP text page 1, Table 1 or Figure 7. For clarification and tracking purposes, these sites should be added to the SAP text page 1, Table 1 and Figure 7.
10. Table 1. Comments are provided on the revised draft Table 1 (dated 9/18/00), in lieu of the Table 1 provided in this document.

For consistency in nomenclature, please change the column title "Reuse Goal" to "Cleanup Scenario", and add another column "Reuse Plan Designation" (e.g., mixed use, industrial), with an explanatory footnote citing the City's reuse plan. For the title of the last column, the phrase "Analytical Methods" is suggested in lieu of "Planned Analyses".

For this table, DTSC prefers that the COPCs be listed (per the approach of General Comment 9) with associated analytical methods. The text should contain an explanation of why the "COCs (based on RMR process)" are different from the "COCs (based on the TCRA SAP)". However, in Table 1, the fourth column ("COCs (based on RMR process)") should be deleted as it is potentially misleading. Since DTSC did not explicitly identify COCs in the RMR process.

Comments on COPCs and analytical methods for individual sites are given under comments on the FSP Figures 1 through 12, below.

Note 5 to Table 1 should be deleted since the definition of COPCs therein is too narrow (see General Comment 9).

Please correct the formatting for the columns of acronyms. These are scrambled in the copy received.

11. Figure 2. See FSP Comment 2.2.3

### **Field Sampling Plan (FSP)**

1. Site histories. Site histories should be provided for the sites under investigation, including a summary of the remedial investigation (RI) exceedences of criteria, a description of the data gaps, and a statement elucidating how the proposed work will fill the data gap. Similar information should be provided in any addenda to these documents.

### 2. Field Sampling Strategy (FSS)

2.1 The SAP Figure 2 and the QAPP Table A-2 should be included in the FSP since they illustrate the FSS described in Section 3.1.1.

2.2 As previously noted, the FSS should be changed to be consistent with the Parcel B FSS.

Differences between this FSS and the Parcel B FSS are noted in the bulleted items below.

Re: QAPP Table A-3 and FSP pages 3 and 4 (which have identical text).

2.2.1 Regarding horizontal boundary determination:

- \* For clarification purposes, the text from the Parcel B QAPP, page A19, should be included: "In addition, as field conditions are encountered during excavation where additional inspection is deemed prudent, additional samples may be collected. These conditions include the presence of discolored soil, distinct odors, or debris." Of course these conditions, when observed, must be noted in the field logs.
- \* Waste profiling results should be reviewed and any compounds measured above the cleanup goals should be added to the COPCs.
- \* First and second bullets. Change to read: "Discrete pre-excavation sidewall samples..."

- \* Third bullet. Change to read: "On *each* sidewall of each proposed excavation less than 7 feet deep, one biased discrete sample will be collected: the sample will be biased toward the bottom 2 feet of the proposed depth. Sampling frequency will be one sample per 50 feet of wall."
- \* Fourth bullet. Add: "Sampling frequency will be one sample per 50 feet of wall."
- \* Fifth bullet. Regarding "target analytes", use the term COPCs instead (as per General Comment 8).
- \* Sixth bullet. Change to read: "If any sample exceeds any soil cleanup goal..."
- \* Add bullet: "For unopened excavations, samples will be collected at approximately the same depth as the RI sample that exceeded the ROD ESD goals."

#### 2.2.2 Regarding vertical boundary determination:

- \* For clarification purposes, the text from the Parcel B QAPP, page A19, should be included: "In addition, as field conditions are encountered during excavation where additional inspection is deemed prudent, additional samples may be collected. These conditions include the presence of discolored soil, distinct odors, or debris." Of course these conditions, when observed, must be noted in the field logs.
- \* Waste profiling results should be reviewed and any compounds measured above the cleanup goals should be added to the COPCs.
- \* First and second bullets. Change to: "Discrete pre-excavation floor samples..."
- \* Third bullet. Change to: "...to a maximum depth of 10 feet."
- \* Fifth bullet. Regarding "target analytes", use the term COPCs instead (as per General Comment 8).

- \* Sixth bullet. Change to: "If any sample exceeds any soil cleanup goal..."
- \* Seventh and eighth bullets. For clarification purposes, regarding the calculation of the area of the floor, a portion of the text of the email from Richard Mach (General Comment 10) is included below. It is recommended that the email be included in an appendix to the FSP. Although the sites included in these documents are all unopened, the comments (below) which discuss "original" and "new" excavated areas apply if the sites undergo several stepouts.

"2. If the original excavation area achieved a clean bottom via a 5-point composite sample during the first excavation and the total proposed excavation (sum of the first excavation and the new proposed excavation) total less than 500 square feet, the previous 5-point composite sample will suffice for the entire excavation. For example, if the original excavation was 200 square feet and achieved a clean 5-point composite bottom sample and the new excavation will be an additional 200 square feet, an additional bottom sample will not be needed. This approach is consistent with the original RD.

3. If the original excavation area achieved a clean bottom via a 5-point composite sample during the first excavation and the total proposed excavation (sum of the first excavation and the new proposed excavation) total more than 500 square feet, but the new proposed portion of the excavation is less than 500 square feet, the in situ discrete soil sample will be used as the confirmation sample for the new portion of the excavation. An additional post excavation 5-point composite sample will not be collected. For example, if the original excavation was 400 square feet and achieved a clean 5-point composite bottom sample and the new excavation will be an additional 200 square feet, one discrete in situ bottom sample would be collected for the 200 square foot area with no additional 5-point composite bottom sampling.

4. No matter what the previous sampling showed, if the new proposed excavation exceeds 500 square feet, 5-point composite samples will be collected per each new 500 square foot area (or any part of it). For example, if a new excavation is created with a 700 square foot bottom, two 5-point composite samples will be obtained.

5. If a new bottom requiring sampling is created, all COCs being sampled on all of the side walls will be sampled on the new bottom as well. However, if a COC was dropped from all sidewalls

and the bottom of a previous excavation, that COC would not be analyzed in any of the new sidewall or bottom samples. For example, if the original excavation sampled for PCBs, lead, and copper and all four sidewalls and the bottom were clean for PCBs, PCBs would be dropped from further sampling. If there was one sidewall with a lead exceedence and another with a copper exceedence, each sidewall would only be sampled for that individual exceedence, but the new bottom sample would be sampled for both (either via in situ or 5-point composite...whichever is needed based on the criteria above).

6. If the shallow sidewall samples are clean and the excavation was assumed to not extend below 7 fbg, however, the bottom samples require excavation below 7 feet, additional deep side wall samples will also be required, These would be collected post excavation."

- \* Eighth bullet. Change to: "A minimum of one five-point composite sample will be collected on the excavation floor for excavations that extend to a depth of 10 fbg. Sampling frequency will be one sample per 500 ft<sup>2</sup> of excavation floor."

2.2.3 SAP Figure 2: Sidewall Sampling Approach. To be consistent with the Parcel B FSS, this figure should be replaced by Figure A-3 of the Draft Parcel B ROD Amendment, which illustrates the sidewall sampling approach previously discussed between the Navy and the agencies. The text on the figure should be changed to be consistent with FSP comments 2.2.1 and 2.2.2. The table on the figure should be identical to the table on Figure A-3.

2.2.4 The tables on Figure 2 and on Parcel B Figure A-3 show that samples do not need to be collected if the sidewall length is less than 8 feet. That is, the first listing under column length is "8 to 17" feet. What will be done for excavations with sidewalls less than 8 feet? The first listing should be changed to 0 to 17 feet.

2.2.5. Sidewalls: other clarifications. When successive stepouts are required, considerable lengths of adjacent sidewalls walls may be exposed. What will be the sampling requirements for the adjacent sidewalls?

DTSC recommendations are: 1) when the stepouts result in new sidewalls that are longer than original sidewalls, the longer length should be used for determining number of samples to be collected and 2) when

stepouts expose new sidewalls adjacent (perpendicular) to the wall which is being stepped out, additional samples will be required on the newly exposed adjacent sidewalls: however, when only one stepout is required, additional samples will not be required.

2.3 Please describe how the locations of the pre-excavation floor samples and the post-excavation floor samples will be randomly selected.

2.4 Additional field samples may be collected if site conditions indicate contamination (as per FSP comments 2.2.1 and 2.2.2 bullet 1), and additional COPCs may be identified in these field samples. This should be discussed in the text. Also, Appendix C should be re-titled to: Other Analytical Methods and Procedures, in lieu of Potential Future Analytical Methods and Procedures (emphasis added) since these methods may be applied to the sites *currently* under review (as depicted on Figures 1 through 12), as well as to future sites. For example, field conditions may indicate that sampling for VOCs or TPH is appropriate.

3. Screening for VOCs. Please describe in more detail the field screening procedure for VOCs. Are all samples to be screened? Will samples be selected for VOC analyses based on field inspection following excavation ?

With respect to photo-ionization detector (PID) field screening, are the samples to be collected in a baggie and the headspace screened? Open-air screening is not acceptable to DTSC. Will samples with PID readings in excess of 5 ppm be analyzed for TPH-p, TPH-e and VOCs? If not, how will the analyses be selected?

4. TPH analysis. The text should indicate how it will be determined that analysis for TPH-p and/or TPH-e is appropriate. Are all samples to be screened? Will samples be selected for TPH analyses based on field inspection following excavation?

5. Preservation Requirements. The title of Table 1-A should be more accurately changed to: Sample Containerization, Preservation and Holding Times for Soil. Similarly, the titles of Tables 1-B and C-1 should be changed.

5.1 Table 1-A. Please make the following corrections. Glass containers should be specified to have teflon-lined closures. Chromium VI should be added (requirements are polyethylene or glass container with teflon closure, Cool to 4°C., analyze as soon as possible, 4 oz. jar filled to minimize headspace). Specify an analytical method for Chromium

## VI.

5.2 Table 1-B. Chromium VI should be added (requirements are: polyethylene or glass containers with teflon closure, Cool to 4°C., 28 days holding time, 500 ml container filled to minimize headspace). The table should note whether metals are filtered or non-filtered. Storage in the dark should be added to the PAH preservation requirements.

5.3 Table C-1 (Appendix C). The size of Encore samplers should be specified as 5 or 25 grams. As noted in previous comments, a holding time of 14 days for Encore samplers is not consistent with the State of California Hazardous Materials Laboratory's (HML's) requirements. The table should state that the holding time is 48 hours at 4°C., then preserve and analyze within 12 days. That is, the laboratory must extrude the sample from the Encore device within 48 hours and preserve the extruded sample, with analysis within the next 12 days. Another option is a holding time of 7 days for samples frozen at -12°C., then preserved and analyzed within 7 days. The table should also note that the samples should be shipped to the laboratory immediately. Also, please change the text in Appendix C, page C-7 to be consistent with these comments.

5.4 Appendix C, page C-6: error. Change "35" in first sentence to "25".

6. Section 3.1.4: Sample Analysis. The text in this section should be changed to be consistent with previous comments--for example, General Comment 8 and FSP comment 2.

7. Section 3.3: Waste Management. The second sentence says that decontamination fluids will be placed in 55 gallon drums or pumped into tanks. Transportation of waste fluids in drums is not recommended and may be prohibited. Solid wastes should be discussed as well.

8. Section 5.1: Sample Identification and Labeling. The sidewall sample identification (ID) notation doesn't differentiate between "random" samples (randomized with respect to depth but located 17 feet apart) and "biased" sampling (randomized with respect to horizontal location but preferentially located near the floor of the excavation in the top 7 feet or between 7 feet and the floor of the excavation).

An orientation should be specified for the letters A, B, C etc.--for example, clockwise looking into the excavation.

9. Section 5.2: Sample Containerization, Preservation and Holding

Times. This section should refer to the other potential analytical methods in QAPP Appendix 1 and SAP Appendix C.

10. Chain of Custody Records (page 12 and Appendix B).

Temperature should be noted on the chain of custody record by the laboratory upon receipt of the cooler at the laboratory. The chain of custody form should be revised to include a designated area for this notation. The chain of custody records and the laboratory login reports should be included in the field investigation report.

11. Field report. The FSP should contain a description of the report pursuant to this fieldwork. This deliverable should be included on the schedule (Table 2).

12. Schedule. Field activities are scheduled for October 8 through November 8. This doesn't seem to allow enough time for additional stepouts, given that the usual laboratory turn-around-time has been about one month.

13. Figures 1 through 12. Figures 1 through 12 contain the proposed sampling locations and sampling depths. While reviewing these figures, DTSC's focus is on site characterization (as per General Comment 2).

General Comments on FSS. On these figures, depths for the first stepout samples have been provided. However, the depths of the sidewalls cannot be determined until the depth of contamination has been determined by bottom sampling at successive depths. Similarly, depths have been assigned to the second stepout samples (e.g., Figure 1, DMIR08B022 and DM9686 (IR08B016)). However, the FSS says (FSP page 3, last bullet) that if a sample has exceedences, the stepout sample will be collected at approximately the same depth as the exceedence. That is, the depths for the second step out cannot be determined until results of the first stepout have been reviewed. Please provide clarification for these apparent discrepancies.

Calculations of estimated area and volume are provided on some figures. These estimates have questionable utility since the dimensions of the actual excavations will depend upon results of chemical analyses. An example calculation should be provided. The calculations do not appear to be consistently performed (compare DM11260 to DM7167). Why are estimates not provided for all sites? Are the sides of the excavation are assumed to be perpendicular?

### 13.1 IR08: Figure 1: Former PCB Spill Area.

General comment on site designations. This site entitled "Former PCB Spill Area (IR08)" incorporates portions of former remedial areas (RAs) 8-1 and 8-2. De minimis (DM) site DM 9686 and new DMIR08B022 are also included on this Figure 1 and are proposed for investigation, as per DTSC's recommendations in previous comments. (As previously noted (General Comment 9), for clarification and tracking purposes, these two DM sites should be added to the SAP text page 1, SAP Table 1 and SAP Figure 7.) It is confusing to lump the two DM sites together with the Former PCB Spill Area. The former PCB spill area, DM9686 and new DMIR08B022 are treated separately in the comments below.

#### 13.1.1 Former PCB Spill Area (industrial cleanup scenario)

DTSC agrees that the Navy's proposed sampling plan for the former PCB spill area is generally appropriate, with clarifications noted below.

FSS. The FSS for the former PCB spill is different from the FSS described elsewhere in these documents. The text should discuss why the FSS was adjusted for the former PCB spill. For example, samples are to be collected at 3 foot intervals (not two foot intervals) and the deepest samples are to be taken at 9 fbgs (not 10 fbgs), and the entire area is to be characterized at once, rather than in successive stepouts.

Please note that if PCB exceeds cleanup goals in the samples taken at 9 fbgs, cleanup to 10 fbgs (at the minimum) would be required.

The depth limit for sampling is 10 fbgs, which is consistent with human health risk assessment assumptions regarding exposure. However, the data indicate that PCB soil contamination extends beneath 10 fbgs (e.g., IR08MW42A has Aroclor 1260 at 7.2 and 2.8 mg/kg at 15.25 and 18.75 fbgs). The contamination beneath 10 fbgs is not well characterized. The Navy should consider extending sampling beneath 10 fbgs, in order to determine the extent of the contamination and to evaluate whether cleanup of the entire problem might be cost effective.

Many of the Navy's samples will be collected in backfill for the former excavation. This is unavoidable since the topography of the former excavation was not recorded in detail. To ensure that sampling beneath the former excavation will occur, careful logging of the soil cores is required: soil contacts should be indicated on the boring logs.

Delineation area. The delineation area should be extended to include exceedences on the eastern side of the pump station on Hussey Street. Exceedences are: IR08B018A has Aroclor 1260 at 1.2 mg/kg at .75 feet below the ground surface (fbgs), IR08B052 has Aroclor 1260 at 1 mg/kg at .75 fbgs and IR08B027 has Aroclor 1260 at .45 mg/kg at 1.25 fbgs. This data suggests widespread shallow contamination east and northeast of the pump station, where deeper samples may not have been collected. The FSS for this area should address the shallow contamination: that is, initial sampling at 3 fbgs is not appropriate.

The distribution of contaminants suggests that the migration of contaminants (at least on the west side of Hussey Street) may have been influenced by the pump station. The pump station should be noted on Figure 1.

Institutional controls. Current data indicate that PCB contamination extends below 10 fbgs and that exceedences may exist under Building 606. These areas are not proposed for investigation (however, the samples proposed very close to the building may indicate whether contamination under the building exists). Institutional controls will be required for PCB left in place.

Arsenic as COPC. The Navy should describe any arsenic data gaps in the text of the FSP. That is, if in order to fill the data gap, the Navy intends to sample only at certain locations for arsenic, these locations should be explicitly identified.

Note 2 of this figure and SAP Table 1 (revised, Note 3) suggest that all samples at IR08 will be analyzed for arsenic. The Navy should explain why arsenic is included as a COPC for all samples. A large number of samples were analyzed for arsenic at IR08 and only two minor exceedences of the arsenic cleanup goal of 11 mg/kg were measured. At IR08B021 (on the northern boundary of the former PCB spill delineation area), arsenic was measured at 12.9 mg/kg at 3.25 fbgs and at IR08B034 (southwest of the former PCB spill area) arsenic was measured at 11.6 mg/kg at 3.25 fbgs. At both locations, samples taken at nearby depths (1.25 and 5.75 fbgs) were not in exceedence. Since cumulative risks at IR08B021 exceed  $10^{-6}$  ECR, additional sampling at IR08B021 (which is located within the Former PCB Spill delineation area) is warranted (with arsenic, PCBs, and PAHs as analytes).

Benzo(a)pyrene (b(a)p) as COPC. If a data gap for b(a)p has been identified, the Navy should describe the data gap. That is, if the

Navy intends to sample only at certain locations for arsenic, these locations should be explicitly identified.

Note 2 and SAP Table 1 (revised) suggest that all samples will be analyzed for b(a)p. The Navy should explain why benzo(a)pyrene is included as a COPC for all samples.

PAHs should be analyzed for: 1) when b(a)p and/or other PAHs have been measured above screening criteria or 2) when the cumulative risk exceeds or approaches the risk management point-of-departure of  $10^{-6}$  ECR. B(a)p exceeded the cleanup goal of .33 mg/kg at IR08B016 (DM9686) at .99 mg/kg at .75 fbgs. Cumulative risks for PAHs approach  $10^{-6}$  ECR at several locations including: IR08MW38A, IR08B013, -21, -22 (new DM IR08B022), -23. PAHs should be analyzed for at IR08B016 and new DM IR08B022. And, since IR08B013 is located very close to the southern boundary of the Former PCB Spill delineation area, PAHs should be analyzed for at the southern end of the Former PCB Spill delineation area. Cumulative risks at IR08MW38A exceed  $10^{-6}$  ECR: sampling at this location should be considered.

The PAHs occur as a suite. Therefore, individual PAHs that contribute to the cumulative risks should be considered as COPCs. For example, PAHs which contribute more than  $10^{-8}$  ECR should be retained.

13.1.2 IR08B016 (DM9686) (industrial cleanup scenario)

Analytical methods should include PAHs and PCBs, as previously discussed.

13.1.3 IR08B022 (new DMIR08B022) (industrial cleanup scenario)

Analytical methods should include PAHs and PCBs, as previously discussed.

13.1.4 Editorial comments.

\* Note 4 cites "area 8-2" but "area 8-2" is not indicated on the figure: correct to read "Former PCB Spill Area".

\* Titles should be provided for each of the three delineation areas on this figure. The largest area should be designated "Former PCB Spill Area, including portions of former RA 8-1 and RA 8-2", the other two delineation areas should be titled "DM 9686" and "New DMIR08B022". Titles should be noted on the map inserts, consistent with other figures in this section.

\* Note 2 says that "initial samples" will be analyzed for the analytes listed in the table. What are "initial samples"? DTSC presumes that this means the pre-excavation bottom samples and the pre-excavation sidewall samples for the first stepout.

13.2 IR09: Figures 2 (DM6864, IR09B003), 3 (DM6965, IR09B006), 4 (DM6967) and 5 (DM7167): (industrial cleanup scenario)

General comment on FSS. The Navy should provide an explanation in the text regarding the rationale for the sampling on IR09.

The investigations for the four DMs on IR09 are identical in that: 1) only locations with exceedences of the Hunters Point Ambient Levels (HPALs) for total chromium are included, and 2) the proposed analyses for each DM include total chromium and chromium VI. DTSC interprets the FSS (bottom sampling, two stepouts of sidewalls) to mean that the Navy is considering removal of total chromium above the HPAL on IR09. Is this correct? If so, please note that IR09B053 and IR09B009 also have HPAL exceedences of total chromium.

Chromium. Concerns pertaining to the relationship between total chromium (Cr) and chromium VI (CrVI) in soil samples have been enumerated in previous comments from DTSC to the Navy (see comments on the draft RMRs for Parcels C and D) and are not repeated here. Does this investigation hope to resolve concerns regarding the ratio of Cr to CrVI? If so, the Navy should explain how the data collected will be used in this regard.

It is noted that a large number of Cr and CrVI samples have been collected at IR09. About 140 samples were analyzed for both Cr and CrVI (37 locations), 14 samples were analyzed for CrVI only (5 locations), and 9 for Cr only (5 locations). CrVI was measured in about 15 % of samples (13 locations of 42 sampled for CrVI). All detections of CrVI are within about 10 times the detection limits (DLs) for CrVI.

Regarding chromium, it is noted that the industrial PRGs for total chromium (Cr) (450 mg/kg) and CrVI (64 mg/kg) were used as screening criteria during the RMR process. However, in this report, the industrial cleanup goals are different from the criteria used in the RMR process. The cleanup goals are 100,000 mg/kg for CrIII and 10 mg/kg for CrVI. No specific cleanup goal is cited for total Cr.

Cr/CrVI ratios. The industrial PRG value for total Cr assumes a 1/6

ratio (.17) between CrVI and chromium III (CrIII). The cleanup goal for CrIII assumes that total chromium contains chromium III only: that is, it contains no CrVI.

The CrVI to Cr ratio at IR09 is very variable (range .0163 to .0000479), considerably less than .17 (as per the PRGs). The highest ratio (.0163) is associated with a very low concentration of Cr (8.6 mg/kg), which indicates exceedences of either the total Cr PRG or the total Cr HPAL are not reliable predictors of CrVI concentration.

Exceedence of Criteria. Note 1 incorrectly says that only chemicals exceeding the industrial soil cleanup goals are shown. However, the only (slight) exceedences of industrial cleanup goals are arsenic at IR09B007 (DM6967, Figure 4) and IR09B017.

The note should say that the total Cr exceeds the sample-specific HPAL and the industrial 1999 industrial PRG. There is no HPAL for CrVI, and CrVI does not exceed the industrial cleanup goal (10 mg/kg) or the industrial PRG (64 mg/kg).

If the rule for IR09 is that chemicals greater than the HPAL are considered for additional investigation (and perhaps remediation), then sites with nickel exceedences should be identified. And, nickel should be added as an analyte. For example, nickel exceeds the HPAL at IR09B003 (1.75 and 5.75 fbgs: DM6864, Figure 2), at IR09B008 (5.25 fbgs), at IR09B015 (5.75 fbgs). Various other metals also exceed HPALs.

Arsenic does slightly exceed the industrial cleanup goal (which is equivalent to the HPAL of 11 mg/kg) at two locations. These are: IR09B007 (12.7 mg/kg at 1.25 fbgs: DM6967, Figure 4) where arsenic should be considered as an analyte, and IR09B017 (14.2 mg/kg at 1.25 fbgs).

Regressions. Since HPALs are determined on a per sample basis, by a regression of chromium against magnesium and by regressions of nickel against magnesium and cobalt, magnesium and cobalt should be added as analytes whenever chromium and nickel are analytes.

It is unclear whether the nickel exceedences of the HPAL have been reconfirmed against the cobalt regression. For clarification, the Navy should provide a table with all nickel exceedences from the remedial investigation (RI) report, indicating which samples are in exceedence of both magnesium and cobalt regressions. Since the cobalt regression

applies only to weathered serpentinite material, the table should note whether weathered serpentinite is indicated on boring logs. Please note that at locations where cobalt exceeds the HPAL for cobalt, use of the cobalt regression is not allowed. The table should note when/if cobalt exceeds the HPAL for cobalt.

Suites. Since it has been determined that Cr occurs in association with nickel, magnesium, and cobalt (and other metals) in serpentinite rocks, analyses for the suite of metals is recommended.

Groundwater. Since there are no exceedences of industrial cleanup goals on IR09, DTSC had recommended no further action (NFA) with respect to human health risks (excluding the potential drinking water pathway). However, since groundwater is contaminated with total chromium, chromium VI and various other compounds, soil investigation and cleanup for resource protection remains a concern. In this regard, leachability tests on sample cores from this investigation might be appropriate. Such tests should be discussed with the BCT.

For your information, the Department of Health Services proposed (in 1998) that the California Maximum Contaminant Level (MCL) in groundwater for CrVI be reduced to 2.5 ppb (from the current value of 50 ppb). This proposal is still under discussion.

13.3 IR37: Figures 6 (RA37-1), 7 (RA37-2), 8 (DM6671) and 9 (DM6771): (residential cleanup scenario)

General Comments. As noted in previous comments on the RMR process, excess residential risks due to metals which have been measured above residential PRGs but less than HPALs exist at IR37 (e.g., manganese, nickel, arsenic, barium, and chromium). These metals may occur in suites associated with the native serpentinite or chert, and/or may be related to site activities. In these comments, additional sampling for metals with concentrations which are greater than residential PRGs but less than HPALs is not requested, since the excess risks have already been acknowledged. ICs may be required for these exceedences since the investigations have not demonstrated that the exceedences are unrelated to Navy activities (i.e., HPALs are ambient concentrations, not background concentrations).

The Navy has expanded IR37 sampling to include DM6671 (IR37SS08) and DM6771 (IR37B021). Sampling at these two locations was requested by DTSC in previous comments. (Note that the

sampling locations were identified by their sample names, not as DMs in DTSC's previous comments).

The Navy should provide rationale(s) for sampling proposed at IR37.

Regressions. The regressions of nickel versus cobalt should be checked and a table provided, as per the previous comment 13.2

Nickel concentrations in nearby IR09 borings were included in the risk assessments for IR37. For example, 6340 mg/kg (5.75 fbgs) at IR09B006, and 2160 mg/kg (5.25 fbgs) at IR09B010. Does residential or industrial cleanup scenario apply at these locations? These concentrations should be included on the tables for IR37 (if residential applies) and IR09 (if industrial applies). If nickel at any location exceeds the HPAL and appropriate residential or industrial cleanup goals, sampling should be proposed.

RA37-1: Figure 6

The question of this site is whether EE14 removed all COPCs to appropriate depths and extents.

For clarification purposes, the three delineation areas on Figure 6 should be titled, and indicated in the map insert as on other figures. Note 2 says that all exceedences are shown: this note should be corrected since only exceedences in RA37-1 are shown, exceedences in DM6671 and DM6771 are indicated on Figures 8 and 9.

More to the point, results of the recent (May 2000) sampling are not included on the figure. IR37B026 and -27 were sampled at 3.5 to 4 and at 5.5 to 6 fbgs and analyzed for metals and CrVI. Very high concentrations of manganese (33,200 mg/kg) and iron (Fe) (54,900 mg/g) were measured: Mn and Fe are above the PRGs and Mn is above the HPAL (Fe has no HPAL). Several metals were measured at concentrations > residential PRG but <HPALs, including arsenic, chromium, and nickel. The RMR (Figure 1.15-2 SHT 2 of 3) indicates that thallium (Tl), selenium (Se) and barium (Ba) were measured > HPALs and > residential non-cancer criteria in both IR37B026 and that thallium was measured > HPAL and > residential non-cancer criteria in IR37B027. Fe, Tl, Se, and Ba should be added as an analytes. Full metal scan is recommended. Also, since CrVI was detected even when concentrations of Cr were low, CrVI is recommended as an analyte.

TPH should be added since TPH-mo, TPH-diesel, TOG and TRPH have been measured at/near RA37-1. Similarly, PAHs should be included since TPHs have been measured.

"Chert gravel" is noted on log IR37B015. The field crew should be asked to check the lithology of the borings for chert fragments.

#### RA37-2: Figure 7

The Navy has included RA37-2 due to antimony exceedences at IR37B021 (82.2 mg/kg at 5.25 fbgs, 75 mg/kg at 10.25 fbgs, and 85 mg/kg at 15.75 fbgs), which is located in Hussey Street. DTSC agrees that the inclusion of IR37B021 is appropriate. Previous review by DTSC has assumed that the industrial cleanup scenario applied to IR37B021 (i.e., DTSC assumed that the boundary between residential and industrial was west of Hussey Street). The fact that Sb exceedences were measured at all 3 depth sampled is noteworthy. IC below 10 fbgs will be required for Sb left in place. The Navy might consider whether extending the investigation below 10 fbgs, and perhaps removing all Sb exceedences might be cost-effective.

Cumulative risks due to PAHs exceed  $10^{-6}$  ECR at IR37B013, which is located near a former UST removal action. Sampling should be conducted at IR37B013 for PAHs. As previously noted, the PAH residential cleanup goals (e.g., .33 mg/kg for b(a)p) are set at about 5 times the 1999 residential PRGs for PAHs (e.g., .062 mg/kg for b(a)p), and as such represent some risk greater than  $10^{-6}$  ECR. PAHs at this location exceed 1999 residential PRGs but do not exceed the residential cleanup goals for individual PAHs, and so are not included on the figure.

If TPH has been measured at this location, TPH should be included.

#### DM 6671 (PA37SS08): Figure 8

This site, located inside building 430, was not included in the RMR. Mn at 2440 mg/kg (1.25 fbgs) was measured. DTSC agrees that Mn is an appropriate analyte.

Please add a title to the delineation area for RA37-1, and change Note 1 as per comments on RA37-1.

#### DM6771 (IR37B021): Figure 9

This site, located east of building 437, has Mn at 2640 mg/kg (.75 fbgs). DTSC agrees that Mn is an appropriate analyte.

Other Mn exceedences above 1400 mg/kg in IR37 include 1520 mg/kg (PA37SS04 at 1.25 fbgs) which is located north of building 435, and 1440 mg/kg (IR50B016 at 1.75 fbgs) which is located east of building 435. Both of these are isolated samples. Additional sampling at these locations may be warranted.

13.4 IR53: Figure 10 (DM11260, IR53B018A): (industrial cleanup scenario)

This sample has also been associated with IR16 and IR 69.

COPCs. B(a)p and dibenzo(a,h)anthracene (d(ah)a) have been identified as COPCs. B(a)p was measured at .51 mg/kg (1.25 fbgs) and d(ah)a at .38 mg/kg, above industrial cleanup goals of .33 mg/kg. Since the PAHs occur as a suite, other PAHs that contribute to the cumulative risks should be considered as COPCs. For example, PAHs which contribute more than  $10^{-6}$  ECR should be retained. These include: benzo(b)fluoranthene (b(b)f), benzo(a)anthracene (b(a)a), benzo(k)fluoranthene (b(k)f), and indeno(1,2,3cd)pyrene (i(123cd)p).

Arsenic at 12 mg/kg is slightly in exceedence of the industrial cleanup goal of 11 mg/kg, and should be included as an analyte. Arsenic should be added to the table in Note 2.

Area and volume calculations are not shown on the figure.

B(a)p was measured at one other location at a concentration greater than the cleanup goal of .33 mg/kg at depths less than 10 fbgs. This is at PA53SS03 (.9 mg/kg at 0 fbgs). Since no other PAHs or other compounds were measured at concentrations greater than industrial cleanup goals at this location, and since nearby sampling at several depths was ND for PAHs above 10 fbgs (IR53B013), additional investigation was considered not warranted.

Arsenic has been measured above the industrial cleanup goal of 11 mg/kg at the following locations associated with IR53: IR53B029 (16.6 mg/kg at 6.5 fbgs), IR16B012 (12 mg/kg at 6.25 fbgs), IR69B003 (13.9 mg/kg at 1.25 fbgs) and IR69B004 (11.7 mg/kg at 1 fbgs).

13.5 IR55: Figure 11 (DM10676, IR55B016): (industrial cleanup scenario)

Lead at 1340 mg/kg (1.25 fbgs) exceeds the industrial cleanup goal of 1000 mg/kg at this location. DTSC agrees that lead is the appropriate analyte for this site.

Area and volume calculations are not shown on the figure.

Other exceedences in IR55. Arsenic is greater than the industrial cleanup goal of 11 mg/kg at PA55TA10 (22.5 mg/kg at 3.5 fbgs). B(a)p at .57 mg/kg (3.5 fbgs) exceeds the cleanup goal of .33 mg/kg at this location. Other PAHs were also measured. This was a trench sample in an excavation to investigate contamination in utility lines. As such, it was a biased sample, and presumed to represent the worse-case scenario. Moreover, limited extent was indicated by the trench log and surrounding samples were not in exceedence. Therefore, it was determined that additional sampling was not warranted.

Arsenic exceedence was measured at IR55B019 (24.8 mg/kg at 5.75 fbgs) and b(a)p was in exceedence (.5 mg/kg at 1.25 fbgs) at nearby trench sample PA55TA04. The analyses for these exceedences is similar to that in the preceding paragraph, and no further investigation was recommended.

13.6 IR65: Figure 12 (DM 8866, IR65B004): (industrial cleanup scenario)

Arsenic at 47.2 mg/kg (1 fbgs) exceeds the industrial cleanup goal of 11 mg/kg. DTSC concurs that arsenic is the appropriate analyte.

13.7 IR34: DM8258, IR34B023: (industrial cleanup scenario)

This site was not included by the Navy. DTSC recommends additional sampling at this location due to PAH cumulative risks greater than 10<sup>-6</sup> ECR. TPH-mo was also measured at 6500 mg/kg. PAHs and TPH are recommended analytes.

13.8 Sites not reviewed in these comments, which were reviewed in the RMR process include: IR22, IR32, IR33N, IR333S, IR38, IR68, IR69, and IR70.

14.0 Standard Operating Procedures (SOPs). Comments on Tetra Tech's SOPs were provided by DTSC in previous comments and are not repeated here. DTSC has commented that inclusion of SOPs is not recommended. Instead, pertinent protocols should be excerpted into the text of the FSP.

## Quality Assurance Project Plan (QAPP)

1. Parcel-wide QAPP. As previously noted (General Comment 3), DTSC recommends one comprehensive QAPP for Parcels C and D.

Other QAPP comments contained in the previous paragraphs are not repeated here, for the sake of brevity (e.g., FSS, DQOs, COPCs, analytical methods, etc.).

2. Defers to USEPA. As for previous QAPPs, DTSC defers to USEPA with regard to the "nuts and bolts" QAPP review.

3. COPCs. QA/QC parameters and requirements (e.g., DLs, PARCC parameters, preservation requirements, analytical methods, etc.) should be provided for all compounds in Appendix C, at a minimum, and TPH analyses. This work has already been done in the QAPP for Parcel B and can be re-submitted for Parcels C and D, with minor revisions as needed. Any minor revisions should be called out in the cover letter. The limited list of COPCs in Table A-2 of this QAPP is not sufficient. Table A-2 should be revised as per these comments and those of other agencies, and included in the FSP as well.

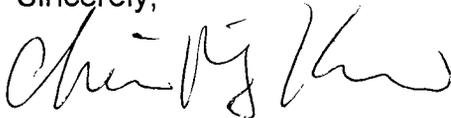
4. Figure A-2. This figure should be revised to reflect previous FSS comments. For example, please include: field screening, waste characterization results, expanded COPC definition, additional samples collected in field post-excavation, TPH COPCs, etc.

5. When will percent moisture and other physical parameters be analyzed? How will percent solids data be used in Encore sampling?

6. Table B-1. Both residential and industrial cleanup scenarios should be included.

If you have any questions, Please contact me at (510) 540-3822.

Sincerely,



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