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June 23, 2000

Commanding Officer
Department of the Navy
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1220 Pacific Highway
San Diego, Ca 92132-5190
Attention: Mr. Richard Mach

DRAFT QUALITY ASSURANCE PROJECT PLAN AND DRAFT FIELD SAMPLING PLAN FOR PHASE I GROUNDWATER DATA GAPS INVESTIGATION, HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA, DATED JUNE 1, 2000

Dear Mr. Mach:

The Department has completed its review of the above-mentioned documents dated June 1, 2000. Our comments are provided below.

Comments on QAPP

1. Data quality objectives (DQOs). The DQOs (Table A-2) in the QAPP are not fully responsive to DTSC's comments on the draft DQOs (letter from Chein Kao to Richard Mach dated May 04, 2000). For example, determination of the extent of dense non-aqueous phase liquids (DNAPLs) and determination of potential pathways of DNAPLs should be included in the problem statements of this data gap investigation. DNAPL concerns have been identified as data gaps on numerous occasions, both in comments and in meetings. When does the Navy intend to address DNAPL issue? Similarly, the extent of light non-aqueous phase liquids (LNAPLs) has not been determined. Another example--optimizing sampling design (Step 7) by eliminating wells that need development or replacement is not an approach acceptable to DTSC. DQOs should also be summarized in the FSP--for example, in a summary table.
2. Site histories. Page A-32. The text says: "Parcel C areas that have

significant contamination are located in IR25 and IR28.” The text is misleading when it confines the discussion to Installation Restoration sites (IRs) IR25 and IR 28. Moreover, it doesn't adequately capture the discussions of the scoping meetings. Remedial units (RUs) were defined in previous reports, comments, and meetings, based on ecological and human health inhalation pathways only. RU boundaries required reevaluation when the drinking water pathway was added during the risk management review sessions. Some of the RUs are not associated with IRs 25 and 28. In addition, upon consideration of drinking water pathways, other areas with exceedences were discussed at the scoping meetings. Previous RUs have been combined into new RU-Cs and RU-D1, after the addition of the drinking water pathway. To clarify the relationship between previous RUs and current RU-Cs, a figure should be included (in an appendix) which shows the extent of the former Rus. The site history section should be expanded and results of previous groundwater sampling events should be included, along with potentiometric surface maps.

3. The QAPP should cite the FSP explicitly in the Introduction and in References. Also, it seems the FSP (the document) is also referred to as PGDGI (phase I groundwater data gap investigation). One acronym should suffice. The Health and Safety Plan (HSP) referenced has not been received at DTSC. The HSP should be included in the Introduction and in References
4. QAPP applicability. The QAPP says that it is intended to be applicable to Parcels B, C, D, and E. However, DQOs and site histories are included for Parcels C and D only, and there are multiple references to the PGDGI (which refers to the phase I groundwater data gap investigation for Parcels C and D only) and to the FSP (which also applies to the PGDGI). As it stands now, the document is only applicable to Parcels C and D. It will require significant revision for applicability to other parcels.
5. Quality Assurance (QA) review. A detailed review of QA procedures is being performed by USEPA's QA team. Laboratory QA requirements in the QAPP are reportedly consistent with USEPA's contract laboratory program (CLP) requirements. Consistent with previous QA documents for this site, DTSC defers to USEPA in this regard (e.g., sections A5.6, A6, B and D). USEPA's comments are contained in the letter of June 19, 2000 from Claire Trombadore to Richard Mach. For the sake of brevity, they will not be repeated here. Percent recovery and relative percent differences (RPD) (Tables 3-1 to 3-5) are not all consistent with recommendations of the State of

California Hazardous Materials Laboratory's Users Manual (revised 1999).

6. Monitoring Well Sampling Sheet. Monitored natural attenuation (MNA) field parameters should be added to this sheet (e.g., ferrous iron). Low flow with minimal drawdown (i.e, micropurging) techniques are recommended for MNA parameters (and other compounds), in order to minimize introduction of air into the well. This sheet is designed around the concept of extracting three well volumes for purging, not around the concept of micropurging. As such, some critical parameters are not included. Purge rate should be recorded and/or calculated (e.g., time since beginning of purging needs to be added). Sampling rate should never exceed purge rate. During purging, pumping at a rate (less than 1 liter per minute) that does not lower the level of water in the well more than 10% of the screened length is one rule of thumb that has been applied (i.e., at Dover Air Force Base). Wells can be pumped in excess of 1 liter per minute so long as drawdown does not exceed 10% of the screened length. During sampling, pumping rate should be reduced to 100 milliliters per minute. The samples should be collected in order of susceptibility to artificial aeration (e.g., volatile organic compounds (VOCs), total organic carbon (TOC), methane, iron, sulphide, alkalinity, sulphate). Sampling tube should be held against/very close to the mouth of the sample container (held at an angle) to prevent aeration. In-line filtration is required. Dissolved oxygen (DO) reading greater than 10 mg/l should be resampled. DO is sensitive to temperature (T) so T readings should accompany DO readings, and care should be taken to eliminate T gradients (i.e., those cause by sunlight, hot surfaces, etc.). The relationship between DO and Eh should be plotted in the field to catch any errors and allow for immediate resampling. It is confusing that this Monitoring Well Sample Sheet is included in the QAPP and another sheet, specific to micropurging, is included as an attachment to standard operating procedure (SOP) 015 (Attachment A of the FSP). Which sheet is to be used? (See also FSP comment 8.)
7. Chain of Custody (COC) Record. Temperature should be added to the COC record.
8. Table 2-1. For mercury (Hg), holding times are 28 days for glass but 13 days for plastic. Since plastic is proposed as the container, the holding time should be changed to 13 days. For pesticides (but not for polychlorinated biphenyls (PCBs)), a pH of 5 to 9 is recommended for preservation. Under nitrate and total dissolved solids (TDS), what does "MCAWW" mean? Regarding ferrous iron field analysis, please

provide information (catalogue or brochure) on HACH method 8149, Color disc/PAN.

9. Table 2-2. For TDS, no water quality criteria are listed. However, they do exist are an essential component of this investigation. Both the USEPA's and the RWQCB's criteria for drinking water aquifers should be listed. Also, the laboratory reporting limit (LRL) is equal to the USEPA's criterion (10,000 mg/L) and it is greater than the RWQCB's criterion (3,000 mg/L). This will be problematic in data interpretation, since areas that exceed the RWQCB's criteria but do not exceed the USEPA's criteria will not be able to be delineated. The table should include both state and federal maximum contaminant levels (MCLs). Other LRLs are greater than criteria cited (i.e., 1,1,2,2-tetrachlorethane and thallium).
10. Subcontractors. Analytical laboratories and other subcontractors should be identified.

Comments on FSP

1. DNAPLs and LNAPLs. The proposed phase I groundwater data gap investigation for Parcels C and D is generally responsive to DTSC's comments made during scoping meetings. However, a significant omission concerns determination of the extents and migration patterns of DNAPLs and LNAPLs. This data gap concerning NAPLs (especially DNAPLs) has been discussed in numerous comments and meetings. How does the Navy intend to address DNAPL concerns? This review assumes that LNAPLs will be further investigated as part of the RWQCB's corrective action program (CAP).
2. Other agency reviews. DTSC concurs with RWQCB's comments on the FSP and the QAPP (letter: June 16, 2000). Similarly, DTSC concurs with USEPA's comments on the FSP for Parcel C, (letters: June 13 and June 19, 2000). For the sake of brevity, those comments will not be repeated here (unless emphasis is intended, or a difference is noted in the comments below).
3. Purposes and objectives. The purposes and objectives of the investigation, as well as a summary of the DQOs, should be included in the FSP. (QAPP comment 2 regarding site histories applies here as well).
4. Data gaps. Data gaps should be explicitly identified, and the FSP should discuss how the proposed FSP will fill the data gap.

5. New Wells. A table should be included which lists all proposed new wells. Well specifications (e.g., depths, screened intervals, installation method, etc.) and rationales for well designs and for well locations should be included on the table. The FSP states that mud rotary or air rotary casing hammer (ARCH) drilling will be used. When will the drilling method be selected? What are the criteria for selection of drilling method? The FSP states (Section 4.4) that borings "may" be drilled prior to well installation. When will it be determined if the borings will be performed, and what are the criteria for making the determinations? Why are mud rotary borings to be used in lieu of a push type investigation? The FSP states that borings will be "abandoned". All borings should be grouted using a tremie pipe as per permit requirements. Use of the word "abandoned" is strongly discouraged (see FSP comment 6). What geophysical data will be collected? Soil sampling (chemical analytes and physical parameters) during well installation has not been included. Provide an explanation for not collecting soil samples. The FSP states that lithologic descriptions will be made from soil cuttings (from mud rotary drilling?). Will soil cores also be collected for evaluation by the field geologist? A figure should be included with proposed well construction details, to supplement to the table requested above. Will centralizers be used? Will groundwater samples be collected immediately after well development? Metals analyses can be high biased when samples are collected immediately after well development.

6. Monitoring Well Inspections. The first paragraphs of this section 4.1 are in contradiction with each other. The first paragraph says that the Navy has "completed" light maintenance but the third paragraph says that the Navy "will perform" basic maintenance. The current condition of each well cannot be ascertained from the information provided. Well Investigation Report. The Navy should prepare a report summarizing the well investigation, as requested in previous comments from DTSC. The scope of this report should be proposed by the Navy and discussed with agencies. The report should include: a table summarizing well specifications and well status, dates of installation/decommissioning, well inspection forms, decommissioning permits, photos, field logs, well logs, etc. Corrective action forms should be included. Of especial concern are the many wells noted as "abandoned" on Table 4-2. Does "abandoned" mean permitted decommissioning as per state and local laws and ordinances? Use of the term "abandoned" is strongly discouraged since its meaning is not clear in this context, and since it implies a dereliction of duty. Abandonment of wells is not allowed under California and local law and ordinances. It is noted that in previous comments (on the draft DQOs), approval by DTSC was required for well decommissioning.

Was approval obtained for the wells listed as "abandoned?" If so, references for the approvals (i.e., letters, meetings) should be contained in the table. It is noted that for some wells with floating products, the extent of LNAPL has not been determined--this is a data gap, as previously noted. Some wells are "not located." What is the Navy's intention regarding locating these wells? Similarly, for some wells additional survey data are needed--what is the schedule for obtaining this data? As previously noted, the need for development of a well is not sufficient reason for eliminating the well from a sampling program or for decommissioning a well. Similarly, poor maintenance is not a sufficient reason for exclusion from water level measurements or sampling programs. Many wells are noted as "missing top of casing." Has corrective action been taken for these wells? Have wells been re-surveyed? Are all wells locked? Please change page 4 (bottom) to read: "Wells should be repaired in accordance with California Water Well Standards and local ordinances."

7. Well Level Measurements. A list of all wells for groundwater level measurements should be included. Proposed new wells (Figure 4-4 and 4-5) are not included in the figure indicating wells for water level measurements (Figure 4-1). Water levels should be taken in all wells at the time of sampling. This is standard procedure and a DTSC requirement. A schedule for water level measurement events should be included. Have all wells previously identified as having anomalous water levels been included?*
8. Sampling methods (Section 4.3.3). The first few sentences of this section are in apparent contradiction--additional clarification should be provided. Will micropurging be used? If so, please note that a bailer cannot be used for micropurging, as noted in the USEPA guidance (Puls and Barcelona)--the primary reference for SOP 015 (Appendix A). This fact is also emphasized in SOP 015 (Section 2.0): "Bailers and high capacity submersible pumps are not considered acceptable micropurge sample collection devices." It is inappropriate to amend the SOP to allow the use of bailers, if that is indeed what is meant by section 4.3.3. In fact, the SOP makes no sense if bailers are to be used. SOP 015 is acceptable to DTSC, with the recommendations: 1) that sampling rate be included on the Micropurging Groundwater Sampling Data Sheet and 2) that future revisions incorporate requirements and guidelines for sampling for MNA parameters. Stabilization criteria that is used for this investigation should be the criteria cited in the SOP (not the criteria cited in this section). During purging, extracting four well volumes in lieu of parameter stabilization is acceptable, provided that the other requirements of the SOP are met (e.g., bailers have not been used). Moreover, to avoid aerating

the water column, bailers cannot be used for collection of MNA parameters. (See also QAPP comment 6.) For which wells will the interface probe be used for both DNAPL and LNAPL testing? All wells where product has been detected previously or when free product is suspect should be tested (including those wells not in the sampling program). Free product should be collected for analysis. Diffusion samplers were discussed at the scoping meetings. Are diffusion samplers to be used?

9. Sample Analyses (Section 4.3.4). The order of sample collection is determined based on susceptibility to artificial aeration and should be explicitly stated for all methods used, including field sampling for MNA analytes. For example, semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons-extractable range (TPH-e) and PCBs are given as the second batch in the sample collection order, followed by inorganics. Are these analytes (SVOCs, TPH-e and PCBs) more susceptible than the MNA analytes to artificial aeration? Only samples for CLP metals (dissolved) should be filtered.
10. Analytical Program. "Target analytes" are identified on Table 4-5. The use of this phrase is confusing. The table should be corrected to say "Analytical Method/Reference", and should cite the Method/Reference in column 2 of Table 2-1 of the QAPP. It is DTSC's understanding that for the methods selected, all analytes in the method will be analyzed for and reported on. For example, all analytes of the CLP VOC and CLP SVOC methods will be reported, all analytes of the CLP Metals method will be reported. Analytes of concern should be noted in the column "Rationale for Resampling". Other comments on the analytical program are provided below. It is understood that other analytes and other wells may be added in phase II.
11. Chromium VI (CrVI). CrVI has been identified as a possible analyte of concern for the residential drinking water pathway. Where CrVI has been detected previously or where total Cr has been measured above the residential maximum permissible contaminant level (MCL) (50 mg/L), the wells should be resampled for both CrVI and metals (including total Cr). Parcel C, RU-C1. Few groundwater samples have been analyzed for CrVI in Parcel C. According to the remedial investigation report (Attachment N-D), 7 samples in five wells (PA2852A, PA28MW50A, PA28MW51A, PA50MW03A, PA50MW04A) were analyzed for CrVI, with no detections of CrVI and no exceedences of the MCL for total Cr. However, this is a very small data set for a very large area, considering that CrVI is a known groundwater contaminant at the site, and that some soil samples were

positive for CrVI on Parcel C. The fact that Cr has been detected (if at all) at low concentrations, suggests that Cr and CrVI in the groundwater of Parcel C is not naturally occurring. That is, it is unlikely to be associated with the native serpentinite soils. This indicates that all exceedences should be investigated as contamination. The following wells have exceedences of total Cr and should be added to the program for both CrVI and metals: IR28MW125A (250 mg/L), IR28MW294A (267 mg/L), and IR18MW155A (for an exceedence at nearby MW129A (51 mg/L) which currently has product). Parcel D, RU-D1. To help determine lateral extent of CrVI and total chromium, additional wells should be added for RU-D1. For example, IR09MW37A had CrVI at 20 and 30 mg/L in latest samples (5/12/94 and 9/7/94) and so it is within the plume (i.e. the plume boundary should be redrawn to include this well). Other wells at the west and east periphery of the plume drawn on Figure 4-3 should be included in the analytical program for CrVI and for metals (including total Cr).

12. Monitored natural attenuation (MNA). The rationale for the specific parameters chosen is not provided (that is, a conceptual site model for MNA has not been proposed). For example, why has the Navy selected Nitrogen as N (not NO₃)? Also, all parameters included in the MNA checklist have not been included. For example, methane, ethene, ethane, propane (degradation products of site contaminants) have not been included. The total petroleum hydrocarbon (TPH) analyses (i.e., modified 8015) should request quantification of these compounds. Section 4.3.4 and the footnote for Table 4-5 say that calcium, magnesium, sodium, and potassium are MNA parameters, but these analytes have not been addressed in the QAPP. Because of this discrepancy, it is not clear what the Navy's program includes. Please clarify. The methods to be used for these analytes should be addressed in the QAPP. Collection requirements should be included on Table 4-4. For demonstration of MNA, additional work will be required (see DTSC's MNA checklist previously provided).
13. Well Installation. See FSP comment 5.
14. Aquifer Tests. One objective of the investigation is to understand the hydraulic relationship between aquifers A and B and to develop aquifer characteristics. However, no aquifer tests are proposed. How will the integrity of the aquitard between A and B aquifers be demonstrated?
15. Yield Data. The report should describe the procedures and the schedule for determining well yield.

16. Sample containerization, etc. (Section 6.2). A table showing methods, containerization, and preservation requirements (for field and lab analyses) should be included, since the FSP is meant to be a stand-alone document.
17. Decontamination locations and storage locations for investigation derived wastes (IDW) should be shown on a figure.
18. Standard operating procedures (SOPs). The recommended approach for FSPs is to include detailed description only of the tasks proposed. This cannot be overemphasized. For example, multiple approaches and forms are included in these SOPs and in the QAPP. This is confusing and requires unnecessary extra work. Moreover, it is not clear what will actually be done in the field. It is assumed that the QAPP forms will be used in this investigation. Similarly it is assumed that Tetra Tech's SOPs apply for well sampling, well development, etc. Tetra Tech EM Inc. and International Technologies Corporation (IT) SOPs have not been reviewed in detail, since they contain general information on methods not proposed for this investigation. Nonetheless some comments are provided regarding SOP 015 (see FSP comment 8), and for other SOPs below. SOP 002. For wells with DNAPL or LNAPL, solvent washes will be required for DNAPLs and LNAPLs (as in Section 2.5). Similarly, metals contamination, a dilute nitric acid rinse will be required. SOP 010. Guidance for when to use the interface probe should be included in this SOP (and in SOP 014). This SOP should also include the micropurging option and refer to the micropurging SOP. Turbidity measurement and stabilization is a RCRA requirement as well as a general DTSC requirement and should be included in Table 2. It is not clear why the stabilization criteria in this SOP are different from those in SOP 015.
19. Appendix B. Why are IT SOPs included? IT is not mentioned in the QAPP. Who is responsible for the "Responsibilities" sections of the IT SOPs? SOP 8.1. It is assumed that the Tetra Tech EM Inc.'s Monitoring Well Completion Record of the QAPP is to be used in lieu of IT's Attachment 6.3: Example Well completion Form, which is not acceptable to DTSC. SOP 8.2. It is assumed that Tetra Tech EM Inc.'s forms in the QAPP are used in lieu of IT's attachments to this SOP. SOP 11.1. This IT SOP for aquifer testing is included but no aquifer testing is described in the text. SOP 8.3. This SOP which describes grouting of boreholes is not included. How will boreholes be grouted?
20. Well logs (Attachment C). Why are the well logs included in this FSP?

21. Schedule of Work (Table 8-1). All components of the proposed work are not included on this schedule. For example, water level measurement events are not included, and well investigation and corrective action are not included, and the report for phase I investigation is not included.
22. Phase I Groundwater Data Gap Report. The scope of work for the report and the schedule for the report should be discussed with the agencies.
23. Figures 4-1 to 5. Building numbers should be added to figures so that the references to buildings in the text can be understood. Similarly, IR site boundaries should be indicated.
24. Figure 4-2. The descriptor "wells not available for sampling" should be changed, since this represents the Navy's opinion but not necessarily the opinion of DTSC (see FSP comment 5). Wells with product should be distinguished from those abandoned. Similarly, missing wells and wells for which additional survey data are needed should be distinguished from abandoned wells. The extent of contamination at RU-C5 should include all exceedences, including those on adjacent Parcel B. However, it is understood that the boundary line will be re-drawn after sampling results are received. The convention for boundary lines that are not determined/are disputed, is for such lines to be dashed and/or queried.
25. Figure 4.3. IR09MW37A should be within the plume boundary (see FSP comment 6).

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

Sincerely,



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