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GEOMATRIX

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Project 4850.01

Mr. Ernesto Galang
Engineering Field Activity, West
Naval Facilities Engineering Command
Bldg. 208, 2nd Floor
900 Commodore Drive
San Bruno, California 94066-2402

Subject: Draft Remedial Investigation Report for Site 12 Operable Unit
Naval Station Treasure Island
San Francisco, California

Dear Mr. Galang:

This letter presents the results of a review of the *Draft Remedial Investigation Report for Site 12 Operable Unit* (Draft Site 12 RI) prepared by Tetra Tech EM Inc. (TtEMI) on behalf of the Department of the Navy Engineering Field Activity West (the Navy). This review was performed by Geomatrix Consultants, Inc. (Geomatrix), on behalf of the City and County of San Francisco, Mayor's Office, Treasure Island Project (the City). The Draft Site 12 RI represents an update of information first presented as part of the *Draft Final Remedial Investigation Report* (Draft Final RI) prepared by PRC Environmental Management, Inc. (now operating as TtEMI) in 1997. Geomatrix reviewed portions of the 1997 Draft Final RI pertaining to Site 12 on behalf of the City; our comments were provided to the City in a letter dated March 20, 1998, and were subsequently forwarded by the City to the Navy. Since that time, numerous additional investigation and assessment activities have occurred at Site 12, some of which have addressed several of our previous comments. Comments in our March 20, 1998 letter that are still pertinent to the Draft Site 12 RI and other comments on revised information are discussed herein.

Our primary comments are summarized below, followed by additional miscellaneous comments. It should be noted that we did not undertake a comprehensive verification of the information presented in the Draft Site 12 RI. However, if in the course of our review we identified an apparent discrepancy, then it is noted below.

1. Executive Summary: Several issues discussed in the body of the document are not reflected in the executive summary. It would be helpful if these issues were included in the executive summary because it may be the only part of the report read by some individuals. These issues include, but are not necessarily limited to:

- Sampling conducted by Geomatrix on behalf of the City in February 1998 included analyses for pesticides as well as dioxins and furans (dioxin).
- Fate and transport modeling was also conducted for total petroleum hydrocarbons (TPH).
- A screening-level evaluation of potential health risks associated with exposure to chemicals in groundwater by construction workers was conducted as part of the RI, even though it was not officially considered part of the Human Health Risk Assessment (HHRA).
- The term "segregated hazard index" is not explained.
- The difference between the "DTSC blood lead model" and "modified DTSC model" is not described.
- It would be helpful if the recommendation for additional sampling in the debris disposal area was supported by information in the previous sections of the executive summary, including the fact that dioxin is a target analyte in addition to lead. Furthermore, it should be clarified that the primary data gap for lead was for surface soil not subsurface soil, even though additional subsurface samples were taken as part of this sampling effort.
- It would also be helpful if the recommendation to review soil gas data being collected to address Title 27 was supported by information in previous sections of the executive summary. Otherwise, there is no context for the reader to understand why this recommendation is being made.

2. Section 2.5.4 (Groundwater Quality and Beneficial Uses): It should be noted in the first paragraph of this section that while a lens of water with low total dissolved solids (TDS) concentrations is present beneath the island, it is limited in extent. Additionally, the discussion presented in Section 4.3.2.2, which concludes that there are no historical, current, or anticipated future uses of groundwater, would also support the discussion in Section 2.5.4. Furthermore, the Navy may want to model the potential impact of saltwater intrusion on a production well to support that the fresh water is not of sufficient volume to be considered a potential drinking water source. It is our understanding that the Regional Water Quality Control Board's (RWQCB's) recommendation in its Pilot Beneficial Use Designation Project to de-designate groundwater beneath Treasure Island as a potential drinking water supply has not yet been approved. The modeling could be used to support the RWQCB's proposed de-designation.

3. Section 3.2 (Site 12 Conceptual Model): For completeness, it would be helpful if either the text of this section or Figure 3-1 identified exposure to groundwater by construction workers as a potentially complete pathway. It could be noted in either place that this pathway was evaluated separately from the other pathways for this receptor. In addition, both the text and Figure 3-1 do not appear to be consistent regarding potential ecological receptors. The text only identifies receptors in San Francisco Bay whereas the figure identifies both terrestrial and aquatic receptors. The scope of the ecological risk assessment is further confused by the fact that the bulk of the evaluation of potential risks to aquatic organisms is presented in Section 3.6 (Analytical Results) rather than Section 5 (Ecological Risk Assessment).

4. Section 3.6 – Analytical Results: The source and rationale for the ambient water quality criteria (AWQC) used in this report need to be further documented and explained. References to source documents are inconsistent throughout the report and the hierarchy in which different criteria are applied is not clear. Examples are listed below. These and other discrepancies, if any, should be resolved in the revised Site 12 RI.

   - The primary reference cited in Section3.6 is EPA 1992 (Quality Criteria for Water); however, the values appear to be taken from EPA 1998 (National Recommended Water Quality Criteria) as noted in Table 3-8 (Summary of Results for Groundwater Sampling from Monitoring Wells) and Appendix O (Contaminant Fate and Transport Modeling).

   - The text states that the value for lead of 8.1 μg/l is based on the water quality objective (WQO) provided in the RWQCB' Basin Plan (1995) and is consistent with EPA 1998. However, Table 3-3 of the RWQCB's Basin Plan lists a chronic (4-day average) WQO for lead of 5.6 μg/l, not 8.1 μg/l. Interestingly, a value of 5.6 μg/l is referenced in Appendix O (Contaminant Fate and Transport Modeling). As suggested in the appendix, we believe that the WQOs in the Basin Plan take precedence over EPA AWQC.

   - The precedent described in the previous bullet would also apply to mercury, where the RWQCB WQO is 0.025 μg/l as compared to EPA's recommended value of 0.94 μg/l.

   - The AWQC for silver is not from either EPA 1998 or RWQCB 1995, but apparently from the proposed California Toxics Rule (FR 42159, August 6, 1999); This rule is expected to be finalized in the fall of 1999, after which the criteria contained therein would take precedence over those values presented in EPA 1998, and if appropriate, would be applicable to other chemicals of potential concern (COPCs) as well.

   - The AWQC for copper is listed as a chronic, not acute, value in EPA 1998.

5. Section 3.6 (Analytical Results): Several detected chemicals do not have AWQC to which the data can be compared (e.g., some semivolatile organic compounds). As stated in our March 20, 1998 letter, these chemicals should be identified and the potential risks to aquatic organisms should be discussed, at least qualitatively.

6. Section 3.6.4.7 (Metals): We agree with the discussion in Appendix O that analytical data from filtered groundwater samples are more appropriate for comparison to AWQC than unfiltered samples. Because there are four quarters of filtered groundwater sampling data, we suggest limiting the comparison to AWQC in this section to these data. The unfiltered groundwater monitoring data could still be reported here or in an appendix for completeness.

7. Sections 4.0 (Human Health Risk Assessment) and 4.2.1 (Data Evaluation): Data collected on behalf of the City in February 1998 included analysis of pesticides as well as dioxin. It is unclear if these additional data for pesticides were included in the HHRA.

8. Section 4.3.2.2 (Exposure Pathways) and Appendix I (Health Effects Associated with the Consumption of Fish: The statement that a RWQCB study confirms or documents that ingesting fish caught in the Bay can result in adverse health effects is misleading. Data collected by the RWQCB and the Department of Fish and Game identified the presence of several chemicals in fish tissue samples collected from the Bay. The measured concentrations were compared to pilot screening criteria based on certain assumptions regarding exposure and standard toxicity criteria for these chemicals; six chemicals were identified as being present in fish tissue samples above the screening criteria. These results were used by the Office of Environmental Health Hazard Assessment (OEHHA) to develop the cited health advisory. However, this does not mean that a causal link has been established between the ingestion of fish from the Bay and adverse health effects. In fact, OEHHA is careful to use the phrase "potential adverse effects" is their health advisory. These sections should be rewritten to reflect this very important distinction.

9. Section 4.8.2 [Site 12 (Area 2)]: The previous section for Area 1 presents additional justification as to why no further action is warranted given that the estimated excess cancer risks are between $1x10^{-6}$ and $1x10^{-4}$, as requested by DTSC. A similar discussion needs to be presented in this section. For simplicity, it may be possible to refer the reader to the previous section for those points that are the same for both areas.

10. Table 4-17 (Screening Lead Concentrations in Soil) and Appendix M (DTSC Lead Model): The same exposure assumptions were used to estimate screening levels for both the commercial industrial and construction worker. This is inconsistent with DTSC guidance and how other chemicals were evaluated for these receptors in the HHRA. Construction worker-specific assumptions for the Lead Spread Model are provided in an "Addendum to chapter 7 of DTSC Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities" (undated, but attached to a

1993 memorandum from DTSC). While it is unlikely to change the conclusions of the HHRA, these assumptions should be updated in the next version of the Site 12 RI.

11. Section 5.0 (Ecological Risk Assessment): This section needs to be expanded to better explain how ecological COPCs in groundwater were identified. As written, this section simply states that the ecological COPCs are arsenic, silver, and zinc based on a comparison of 1998 monitoring well samples to AWQC. However, there is no explanation as to why the comparison was limited to the 1998 monitoring well data, especially given the fact that older monitoring data as well as grab groundwater data are compared to AWQC in Sections 3.6.4 (Monitoring Well Summary), 3.6.5 (Hydraulic Punch Data Summary – Phase IIB RI), and 3.6.6 (Geoprobe and Hand Auger Boring Data Summary – 1996 through 1998). Furthermore, it would be helpful if the results of these comparisons were summarized in a table (e.g., chemical, range of detected concentrations, AWQC or other appropriate screening level) so that the reader does not have to rely on the earlier discussions in the aforementioned sections.

12. Section 5.0 (Ecological Risk Assessment): The statement that all COPCs are modeled in Appendix O is potentially misleading. For example, Appendix O presents the results from previous modeling efforts for chemicals other than arsenic, silver, and zinc (e.g., chlorinated pesticides and polychlorinated biphenyls [PCBs]). If these other chemicals are considered ecological COPCs, then they should be identified as such in Section 5.0. On the other hand, if these chemicals are no longer considered ecological COPCs because only the 1998 monitoring data are considered applicable, then the previously modeling efforts for these chemicals are not longer pertinent and should be removed from Appendix O. In either case, the ecological COPCs should be clearly identified in Section 5.0 and only those chemicals should be discussed in Appendix O.

13. Appendix O (Contaminant Fate and Transport Modeling): Section O.7.1 describes that fate and transport modeling was previously performed for chlorinated pesticides and PCBs and qualitatively describes the results of the evaluation. Because this is a stand-alone document, not an addendum to the previous draft, Appendix O should present input parameters and results (in the tables, text, and conclusion sections of this appendix) for all of the ecological COPCs, including chlorinated pesticides and PCBs if appropriate (see previous comment). A discussion of differences in the modeling approach between the current and previous draft report should be presented in a cover letter or separate appendix (e.g., response to comments).

14. Appendix O (Contaminant Fate and Transport Modeling): As stated in our March 20, 1998 letter, the modeling evaluated transport for a 200-year period; however, no basis for selecting this time period was provided and it appears to be arbitrary.

15. Appendix O (Contaminant Fate and Transport Modeling): As stated in our March 20, 1998 letter, the modeling for metals transport assumes a source of metals to the groundwater from a period of 1948 to 1965, after which there is no further source of metals to the groundwater. There is no historical information that we reviewed that supports this assumption. Further, the RI does not appear to have identified the source(s) of metals in groundwater at the site. As mentioned in Appendix O, the strength and duration of the source is the primary factor that will determine the extent and rate of chemical transport. Therefore, if the strength and duration of the source is arbitrarily selected, then the results of the modeling are not supportable.

Miscellaneous Comments

It may be beneficial to address the following miscellaneous comments in the revised Site 12 RI.

1. Figure 3-1 (Site 12 Operable Unit Site Conceptual Model): Note "B" appears to be incomplete. It is unclear what is meant by footnote "(a)" ("Ingestion of fish evaluated for humans; ingestion of fish and other aquatic organisms evaluated for ecological receptors").

2. Section 3.6.1 (Soil Sample Results – Phase I and IIB RI): The concept of "ambient concentrations" is introduced in this section without explanation. It would be helpful if the brief explanation currently provided on page 3-25 was moved here.

3. Sections 3.6.4 (Monitoring Well Summary), 3.6.5 (Hydraulic Punch Data Summary – Phase IIB RI), and 3.6.6 (Geoprobe and Hand Auger Boring Summary Data – 1996 Through 1998): These sections are not consistent in their use of AWQC or TPH screening criteria. In most cases, these criteria are used to put the analytical data in context. We believe such comparisons are useful in communicating the potential significance of the results and suggest that these comparisons be made consistently throughout these sections.

4. Section 4.3.3.4 (Homegrown Produce): The ingestion of homegrown produce pathway is evaluated only for polycyclic aromatic hydrocarbons (PAHs) and dioxin. A statement should be added to this section explaining why this pathway was not evaluated for the remaining chemicals of potential concern (e.g., some metals and semivolatile organic compounds [SVOCs]).

5. Tables 4-4 through 4-7 (Concentration Terms for Soil COPCs): Footnotes "c" and "d" should provide percentile values used for nonparametric data sets.

6. Table 4-11 (Intake Parameters and Equations for Inhalation of Volatiles and Particulates from Soil: The particulate emission factor (PEF) for the construction worker is the same as for the other scenarios, which does not reflect the fact that an increased amount of dust is generated at construction sites relative to what is otherwise generated by the wind. This

issue was discussed during a conference call between representatives from the Navy, TtEMI, Geomatrix, DTSC, and U.S. EPA on February 9, 1999. At that time, DTSC agreed that the PEF for construction workers should be higher than for the other scenarios. DTSC's default value is equivalent to 1000 micrograms per cubic meter ($\mu g/m^3$). We acknowledge that updating this parameter will not change the conclusions of the HHRA because the inhalation pathway is a minor contributor to the overall risk.

7. Section 6.0 (Nature and Extent of TPH and Chemical Risk Drivers: The City's request for additional characterization of lead in the Burn Pit Area was not based solely on the fact that lead had been detected at concentrations greater than 400 mg/kg in this area. Other considerations included (1) lead was detected at concentrations well over 400 mg/kg in several closely spaced samples, (2) the detected concentrations included the two highest lead concentrations detected in soil at Site 12, (3) these sample locations corresponded to a historical feature, and (4) no near surface samples were available.

8. Section 8.0 (Conclusions and Recommendations): It is unclear why the first sentence of this section is limited to TPH, volatile organic compounds (VOCs), dioxin, and metals. Other COPCs identified in the RI included SVOCs, including PAHs, PCBs, and pesticides, as noted page 8-3.

9. Section 8.0 (Conclusions and Recommendations): As stated previously, sampling conducted on behalf of the City in February 1998 included analysis of pesticides.

10. Section 8.2 (Groundwater): Fate and transport modeling was conducted for TPH as well as for metals (and chlorinated pesticides and PCBs, depending on resolution to previous comments).

11. Appendix H (Screening-Level Evaluation of Risks for Construction Worker Contact with Groundwater: The text states in two places (pages H-1 and H-2) that this evaluation was limited to the results from filtered groundwater samples. While this is likely to be true for metals analyses, it would seem unlikely that these statements apply to the organics analyses.

12. Appendix H (Screening-Level Evaluation of Risks for Construction Worker Contact with Groundwater: Given that the assessment is based on a comparison of maximum detected concentrations to calculated screening levels, the amount of detail provided in Table H-1 (Concentration Terms for Groundwater COPCs at Site 12) seems unnecessary. Also, it is unclear what is meant by "Volatile – Low Level" in this table.

13. Appendix H (Screening-Level Evaluation of Risks for Construction Worker Contact with Groundwater: Risk-based screening levels were calculated for both the inhalation and dermal pathways; however, only one of these values is presented in Table H-7 (Risk-Based Screening Levels for Groundwater and Maximum Detected Groundwater Concentrations).

It would be helpful if this table provided both values or identified which of the two possible values (presumably the lower one) was presented in the table. Also, the precision in the screening-values is unnecessary and not supportable given the uncertainty in the calculations. We suggest rounding these values to two significant figures, which would be consistent with U.S. EPA Region 9 preliminary remediation goals. Finally, several of the screening values are very high, likely exceeding the solubility of these chemicals in water. In fact, two of the screening levels exceed 1,000,000 mg/kg, which is physically impossible, regardless of solubility. The solubility of the chemicals in water should be considered in establishing an upper limit to the screening level for each chemical.

If you have any questions regarding these comments, please call either of the undersigned at (510) 663-4100.

Sincerely yours,

GEOMATRIX CONSULTANTS, INC.

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