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# Memorandum

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| **TO:** | La Rae Landers and James Sullivan<br>Department of the Navy | **DATE:** | October 20, 2005 |
| **FROM:** | Gary Foote | **PROJ. NO.:** | 4850.005 |
| **CC:** | Marc McDonald and Jack Sylvan<br>Treasure Island Development Authority | **PROJ. NAME:** | Treasure Island |

**SUBJECT:** **Comments on August 2005 *"Draft Remedial Investigation Report, Installation Restoration Site 31, Former South Storage Yard, Naval Station Treasure Island, San Francisco, California"***

On behalf of the Treasure Island Development Authority (TIDA), Geomatrix Consultants, Inc. (Geomatrix) has reviewed the draft Remedial Investigation (RI) Report for Installation Restoration (IR) Site 31. Greg Brorby of Exponent reviewed the human health risk assessment (HHRA; presented in Appendix I and summarized in Section 6.0). Geomatrix's comments on the draft report are presented below and Exponent's comments on the HHRA are attached.

## DOCUMENT SUMMARY

The document presents results from investigations conducted at Site 31 and an assessment of potential risk to human health and the environment. The site includes the paved school yard, 11th Street between the school yard and Child Care Center to the south, Avenue E between the school yard and a vacant lot to the east, and portions of the vacant lot. Under a time-critical removal action (TCRA), the Navy previously removed affected soil from the landscaped area between 11th Street and the school yard. According to the document, results from investigations indicate that there are four debris areas: 2 small areas (Debris Areas A and B) beneath the south end of the paved school yard that appear to be continuous with affected-soil previously removed during the TCRA, (2) a large area in the north central portion of the paved school yard (Area C), and (3) and an area in the open lot east of Avenue E (Area D). It is also well-established that lead-affected soil and debris remains beneath 11th Street. Chemicals exceeding screening criteria are often, but not always, associated with the debris areas.

The document evaluated risk posed to (1) an elementary school child under current site conditions (school yard is paved), (2) elementary school staff under current site conditions, (3) an elementary school child and school staff if the pavement in the school yard were removed, (4) a future construction worker, (5) a future resident, (6) a future commercial/industrial worker and

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(7) a future recreational visitor who may use the lot east of Avenue E. For each receptor, the assessment calculated theoretical excess cancer risks and non-cancer hazard indices following Navy and U.S. Environmental Protection Agency (EPA) requirements (Method 1) and State of California Department of Toxic Substances Control (DTSC) requirements (Method 2). In general, the second method is more conservative. Results were compared against EPA's risk management range of $10^{-6}$ to $10^{-4}$ for cancer effects and against a hazard index of 1 for non-cancer effects. Exposures to lead were evaluated independently using DTSC's LeadSpread model and EPA's lead Preliminary Remediation Goals (PRGs).

Conclusions from the human health risk assessment are summarized briefly below.

- The estimated theoretical excess cancer risk under a Reasonable Maximum Exposure (RME) for an elementary school child is below $10^{-6}$ under Method 1 and slightly above $10^{-6}$ under Method 2; the estimated RME non-cancer Hazard Index is well below 1 (both methods).
- The estimated theoretical excess cancer risk under a RME for a hypothetical future resident is above $10^{-4}$ under both methods; the estimated RME non-cancer Hazard Index is above 1 (both methods). Such risks are generally considered not acceptable.
- For all other scenarios evaluated, the estimated theoretical excess cancer risk under a RME is within the$10^{-6}$ to $10^{-4}$ risk management range and the estimated RME non-cancer Hazard Index is equal to (recreational visitor) or below (all other scenarios) 1.
- The calculated blood lead level (99th percentile concentration) for a hypothetical child resident exceeded 10 micrograms per deciliter (µg/dL) and the exposure point concentration for site-wide soil exceeded EPA's industrial PRG of 800 milligrams per kilogram (mg/kg). The document appears to conclude that lead risks are largely driven by lead "hot spots."

The document concludes that the nature and extent of contaminants are adequately characterized and "existing site conditions are considered protective of human health and the environment under current land uses at the site." However, the document recommends that a Feasibility Study (FS) be conducted to evaluate alternatives that would ensure protection of human health if the area is developed for residential or commercial/industrial use or the schoolyard pavement is removed.

## GENERAL COMMENTS

1. ***The document concludes that "existing site conditions are considered protective of human health and the environment under current land uses at the site." (Section 9.7).*** We do not necessarily disagree with this conclusion. However, we note that the



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estimated risk posed to school staff (under both Methods 1 and 2) and the school children (Method 2 only) fall within, not below, the EPA's risk management range of $10^{-6}$ to $10^{-4}$. The $10^{-6}$ level is used as the point of departure for determining remediation goals. From this point of departure, other site-specific risk management decisions are considered to justify a higher acceptable risk threshold within the $10^{-6}$ to $10^{-4}$ range (National Contingency Plan). Therefore, the final determination of the acceptable risk threshold is generally made on a site-specific basis by the lead regulatory agency. We also believe that conclusions about current conditions can not be made until the document evaluates the potential health risk posed to current utility workers who may work in 11th Street and current landscape workers who maintain landscaping at the site (See next general comment).

2. ***Conceptual Site Model and Risk Assessment.***
The Conceptual Site Model (CSM) for current conditions (Section1.5) and the Human Health Risk Assessment (Section 6.0) should include a subsurface utility worker and a landscape worker. The risk assessment does state that the hypothetical construction worker evaluated in the HHRA would be protective of a current utility worker, however, the Exposure Point Concentrations (EPCs) used to evaluate a hypothetical construction worker were based on data collected across the entire site. A utility worker is most likely to be exposed to significantly impacted soil within utility corridors (11th Street) and, therefore, we believe that a separate current utility worker scenario should be evaluated based on data from the 11th Street debris area (See Exponent General Comment No. 2). Additionally, landscape workers currently work in the landscaped areas between the school yard and Avenues D and E and 11th Street. Therefore, exposure to this current receptor also should be evaluated.

3. ***Debris Areas.***
We have two comments with respect to the debris areas shown on Figure 1-4 and numerous subsequent figures: (1) The figures do not show the debris area that has clearly been documented to exist beneath 11th Street. This debris area should be delineated and labeled "Debris Area E." (2) The basis for the delineations of the four identified debris areas is not clear. The delineations appear to be based on observations during drilling and trenching, however, no trench logs are provided in the report and only 22 of the boring logs are included in Appendix A. Therefore, it is not possible to independently verify the accuracy of the interpretation. We recommend producing a figure that summarizes observations of debris (similar to what has been done at Site 12) and providing all supporting information in an appendix.

4. ***Extent of Chemicals Associated with Debris Area D.***
It does not appear that the extent of chemicals associated with Debris Area D has been



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delineated south of location S031-05 (TPHmo and lead), northwest-southwest of location S031-03 (PAHs and dioxins) and east of location S031-43 (dioxins; see Figure 4-10). Data from the Site 30 investigation may address the extent of TPHmo and lead south of S031-05 and, if so, should be included in this document.

5. ***Historical Radiological Assessment.***
Comments on the Draft Historical Radiological Assessment were prepared on behalf of TIDA by ChemRisk, and recently submitted to the Navy. In these comments, it was noted that the Navy has identified Solid Waste Disposal Areas in Site 12 as possibly "impacted," but did not identify other debris disposal areas (such at those as Site 31) as potentially "impacted." We requested justification for the determination that debris areas outside of Site 12 are not "impacted." This RI should not be finalized until this issue has been resolved.

**SPECIFIC COMMENTS**

1. ***Executive Summary, p. ES-5.***
The text states, "COPCs identified in soil at Site 31 included (but were not limited to)….." Please explain why all COPCs are not listed.

2. ***Executive Summary, p. ES-5, third and fourth bullets.***
These bullets describe risk "inside the schoolyard fence line." It is our understanding that this scenario assumed that the pavement was removed. Please clarify.

3. ***Section 1.2.3 Site 31 History.***
This section describes the site history beginning with the late 1960s. This section also should discuss what is known about the site history prior to the late 1960s.

4. ***Section 1.2.2, last sentence and Section 1.2.4, first paragraph.***
These sections discuss the fact that Site 31 encompasses parts of Environmental Baseline Survey (EBS) parcels T094 and T095. The southeast section of Site 31 encompasses portions of EBS Parcels T089 and T092. The text should also discuss these parcels and they should be shown on Figure 1-3.

5. ***Section 2.3.3, third paragraph.***
This section makes reference to trench logs from the TCRA. Trench logs from the TCRA and from site investigations should be included in this report and used in documentation of site conditions (Section 3). It appears that only information from boring logs was used (see General Comment #3).

6. ***Section 2.3.3, third paragraph.***
This paragraph describes backfilling following implementation of the TCRA. Please



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describe backfill sampling and results that led to the conclusion that the backfill was "clean."

7. ***Section 2.4.2 Excavation Trenches—Phase II.***
Please identify the location of trenches where debris was observed that warranted additional step-out trenching.

8. ***Section 3.4.1 and Figures 3-4 and 3-5 (Cross sections).***
Please include the source of information that provides the basis for the understanding of the thicknesses of dredge fill, shoal sand, and Younger Bay Mud at Site 31. It does not appear that site investigations were conducted below the base of the dredge fill material.

9. ***Section 4.2, Soil Sample Results***
For each subsection in Section 4.2, the text should discuss whether analytical reporting limits for any non-detect samples exceed screening criteria.

10. ***Section 4.2.1 Volatile Organic Compounds, Section 4.2.3 Semivolatile Organic Compounds, and Table 4-3 Statistical Summary of Soil Analytical Results.***
The document should acknowledge that the screening criteria (EPA PRGs) for volatile constituents (including naphthalene) do not consider exposures do to vapor intrusion, however, exposure via this pathway were independently evaluated in the human health risk assessment.

11. ***Section 4.2.6 Metals, Arsenic and Manganese (p. 4-7) and Appendix H.***
The document concludes that arsenic and manganese concentrations were within ambient as the result of favorable results from the quantile test. In both cases, the favorable results were obtained despite the highest concentrations reported for the site exceeding the highest reported for ambient. Further, in the case of arsenic, Table H-9 indicates that in the southeast quadrant, concentrations exceed the ambient, suggesting that high arsenic concentrations are more prevalent in a limited region of the site. The report should provide more information to support the conclusion that arsenic and manganese concentrations are within ambient. This information should include a tabulation (preferably in electronic form in an EXCEL spreadsheet on a CD accompanying the report) of the individual concentrations in both the site data set and the ambient data set. For the site data set, individual concentrations should have sufficient location information to permit sorting into the classifications used in Tables H-4 through H-9 (i.e., surface soil, unpaved areas outside the fence; surface soil, inside schoolyard fence line; etc.)

12. ***Section 4.2.7 Polychlorinated Dioxins and Furans.***
The text here should restate the fact that the 19 samples analyzed for dioxins/furans were biased toward observations of burnt material.



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13. ***Section 4.3 Groundwater Results.***
This section should include results from well 30/31MW106, located in 11th Street and the well should be shown on figures. We understand that this well was installed to assess potential groundwater impacts downgradient of Site 30, however, the well is physically located within Site 31 and the data are relevant for understanding groundwater conditions at Site 31.

14. ***Section 5.1.2 General Physical and Chemical Properties.***
This section should discuss the physical and chemical properties of cadmium, iron and manganese, (all of which exceeded screening criteria) or provide a clear rationale for why it is not necessary to discuss these constituents.

15. ***Section 5.1.3 General Toxicological Information.***
This section should discuss the toxicological properties of cadmium, iron, manganese, and bis(2-chloroethyl)ether (all of which exceeded screening criteria) or provide a clear rationale for why it is not necessary to discuss these constituents.

16. ***Section 5.2 Contaminant Fate and Transport Processes.***
We do not concur that it is not necessary to discuss fate and transport of chemicals that exceeded screening criteria at only one location. Most notably, we believe it is appropriate to discuss bis(2cholorethyl)ether because of its relatively high mobility in the environment.

17. ***Section 8.0 Applicable or Relevant and Appropriate Requirements (ARARs).***
This section evaluates both chemical-specific and location–specific ARARs, but does not discuss action-specific ARARs, as required under CERCLA. We acknowledge that it is more appropriate to evaluate action-specific ARARs in a FS; however, this document should indicate that such an evaluation will be conducted in the FS.

18. ***Section 8.2 Chemical-Specific ARARs.***
The text states that no chemical-specific ARARs were identified because, in part, risks associated with exposure to soil were below or within the target cancer risk range ($10^{-6}$ to $10^{-4}$). We believe that it is pre-mature to conclude that chemical-specific ARARs do not apply. Under the residential scenario, the estimated excess cancer risk did exceed the target risk range. Therefore, it appears that chemical-specific ARARs will have to be developed in the FS. Furthermore, under most scenarios evaluated (including current scenarios), the estimated excess cancer risk was within (not below) the acceptable risk range. As indicated in General Comment No. 1, the lead agency has not yet concurred that site conditions are sufficiently protective, even for the scenarios with risks within the risk range. We believe it is appropriate to defer assessment of chemical-specific ARARs (such as soil cleanup levels) until after such decisions have been made.



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Exponent

EXTERNAL MEMORANDUM

TO: Gary Foote – Geomatrix

FROM: Greg Brorby

DATE: September 27, 2005

PROJECT: 8601649.003

SUBJECT: Comments on Site 31 Remedial Investigation Report

This memorandum presents the results of my review of specific sections of the draft "Remedial Investigation Report, Installation Restoration [IR] Site 31, Former South Storage Yard, Naval Station Treasure Island, San Francisco, California," dated August 2005. Specifically, my review focused on Appendix I, Human Health Risk Assessment (HHRA). In addition, I reviewed other sections of the report that pertain to the HHRA, as indicated below. It should be noted that this review did not include a rigorous assessment of the information presented in the tables, nor any verification of the risk assessment calculations.

## General Comments

1. Executive Summary, p. ES-10 — Because the report concludes that "further evaluation of lead, dioxins, and/or PAHs [polyaromatic hydrocarbons] at currently paved locations in Debris Areas A, B, and C (under the schoolyard), Debris Area D (in the southeast quadrant), and under 11th Street or 11th Street sidewalks may be warranted," a feasibility study should be undertaken at this time, not only "in the event that the area is developed for residential or commercial industrial use or the school remains in operation but the schoolyard pavement is removed" [emphasis added]. This comment also applies to Section 6.4.

2. Section I.8.1.2, p. I-16 — The hypothetical construction worker evaluated in the HHRA may not necessarily be protective of a "current" utility worker at Site 31. For example, the exposure point concentrations (EPCs) used to evaluate a hypothetical construction worker are based on soil data collected across the entire site whereas a current utility worker would most likely be exposed to soil in current utility corridors under the existing streets. Because there is known debris containing elevated chemical concentrations beneath 11th Street, a separate current utility worker scenario should be evaluated based only on data from this area of the site.

**Specific Comments**

1. Section I.3.0, pp. I-2 to I-3 — This section should acknowledge that a different risk assessment methodology was used to evaluate the portion of Site 31 located east of Avenue E, later referred to as the southeast quadrant (i.e., a Tier 1 screening assessment based on residential preliminary remediation goals [PRGs]). This comment also applies to Section 6.1.

2. Section I.8.1.1, p. I-15 — This section should explicitly state that there is no current use of the southeast quadrant or otherwise explain why no current-use scenario was evaluated in the HHRA.

3. Section I.8.3, p. I-18 — Because focused "hot-spot" analyses were conducted, I recommend saying so in this section, rather than saying that they were "considered." Otherwise, the reader is left wondering why hot-spot analyses might not be conducted, despite the fact that the existence of hot spots is acknowledged in this same section.

4. Section I.8.4.2, pp. I-27 to I-32 — The exposure pathways, equations, and input parameters used to evaluate the future residential child are different from those used to evaluate the current elementary school children, because general U.S. Environmental Protection Agency and California Department of Toxic Substances Control guidance was used in the former case, and specific Office of Environmental Health Hazard Assessment (OEHHA) guidance was used in the latter case. Because these differences do not necessarily make sense from a technical perspective (e.g., a future residential child is as likely to be exposed to indoor dust as an elementary school child), some type of discussion of these discrepancies is warranted, perhaps in the uncertainty section. This comment also applies to Section 6.1.3.

5. Section I.9.1, p. I-34 — It is unclear why gastrointestinal absorption values are provided in Tables I-6.1 and I-6.5, and discussed in this section, when they are ultimately not used in the risk calculations. I recommend that they be deleted from the text and tables to reduce the likelihood that the reader will be confused.

6. Section I.10.3, p. I-41 — I suggest including a reference to Tables I-12.1 through I-12.7 in this section, because these tables document all of the assumptions used in the blood lead modeling.

7. Section I.11.1.1, p. I-14 — I believe that this is the first use of the term "risk driver" in the HHRA; however, no definition is provided (i.e., a chemical where the estimated excess cancer risk is greater than $1\times10^{-6}$). This comment also applies to the Executive Summary and Section 6.2.1.1.

8. Section I.11.1.1, p. I-44 — It would be helpful if the concentration of benzo(a)pyrene in the sample collected from Debris Area C was provided, as well as the range of concentrations of the other carcinogenic PAHs detected in this sample.

9. Section I.11.2.1, p. I-48 — It would be helpful if there was additional discussion regarding the single detection of bis(2-chloroethyl)ether (e.g., location relative to other identified hot spots, concentration relative to detection limit and/or PRG, etc.). This comment also applies to Section 6.2.2.1.

10. Section I.11.2.1.2, p. I-50 — Please explain why the single detection of bis(2-chloroethyl)ether was not evaluated as part of this assessment of localized contamination. This comment also applies to Section 6.2.2.1.

11. Section I.11.2.2, pp. I-51 to I-52 — This discussion is confusing. It appears that naphthalene is the only chemical for which an HI for a single chemical is greater than 1 (HI of 4). It also appears that the only target-organ-specific HI greater than 1 is for respiratory effects, and this HI is based solely on naphthalene. If the EPC is recalculated without the hot spot, the resulting concentration is 0.47 milligrams per kilogram (mg/kg), as compared to the original EPC of 4.4 mg/kg (the maximum detected value). Although not presented in the text or tables, the revised HI for naphthalene (and for respiratory effects) would be approximately 0.4. As such, all individual chemical HIs and all target-organ-specific HIs would be below 1, and it would be unnecessary to conclude that the total HIs (i.e., not accounting for target organs) "remain above the benchmark of 1." This comment also applies to the Executive Summary and Section 6.2.2.2.

12. Section I.11.6.2, p. I-59 — The blood-lead modeling results for localized contamination should be provided as tables, similar to the rest of the blood-lead modeling results (i.e., Tables I-12.1 through I-12.7). This comment also applies to Section 6.2.5.2.

13. Section I.12.1.1, p. I-61 — This section should identify why these sample results were rejected.

14. Section I.12.2.1, p. I-64 — Vapors emanating from soil should be added to the exposure pathways listed for recreational visitors in the southeast quadrant.

15. Section I.12.3, p. I-70 — The sentence, "Noncancer hazards may be underestimated for exposure to the PAH COPCs, for which no RfD was available" does not make sense, given that surrogate toxicity criteria were used to evaluate several of the PAHs for which no reference doses (RfDs) were available.

**Miscellaneous Comments**

1. Section I.6.1.2, p. I-6 — Based on Figure 1-4 in the main text (Site Features Map), the fence surrounding the school play yard is not complete along the western boundary, plus there appear to be some unpaved areas within the fence along the southwestern and northeastern sides of the play yard. As such, it may be more accurate to say that "access to the unpaved areas east, south, and west of the schoolyard is *limited* by a chain link

fence" (as opposed to "prevented"). In addition, the use of the word "true" at the beginning of the next sentence (and in Section 6.1.1.1) is unclear.

2. Section I.6.1.3, p. I-7 — To be consistent with the previous section, the number of samples collected in this area of Site 31 should be identified.

3. Section I.7.0, p. I-9 — The first two bullets on this page should be indented further (i.e., they are subbullets under the last bullet on the previous page).

4. Section I.8.3.4, p. I-21 — It would be helpful if the calculations for the air-in-trench EPC were provided in the HHRA to assist the reader in verifying the calculations. In addition, the use of this methodology should be acknowledged in Section 6.1.3.

5. Section I.8.4.1, p. I-22 — As stated in Section I.2.0 (p. I-2), Treasure Island Elementary School has the capacity for 1,000 students in kindergarten through 8$^{th}$ grade. Most children begin kindergarten at 5 years of age, meaning that the age range for this population would be from 5 to 14 years of age, rather than from 6 to 15 years of age as assumed in the HHRA. This slight difference should not, however, have any effect on the HHRA results or conclusions.

6. Section I.8.4.1.2, p. I-24 — It may be worth nothing in this section or in the Uncertainty section that OEHHA's assumption that dermal contact with soil can occur over the entire body (as opposed to uncovered body parts such has the face, lower arms and hands, and lower legs and feet) is extremely conservative and overestimates potential exposure (and risk) associated with this pathway. There may be other assumptions made by OEHHA that warrant similar statements (e.g., the concentration of dust indoors is double the concentration in outdoor soil).