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TREASURE ISLAND
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MEMORANDUM

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DATE: September 22, 2006

SUBJECT: DRAFT SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT FOR SITES 6, 12, 21, 24, 30, 31, 32 AND 33 NAVAL STATION TREASURE ISLAND
[SITE 201210-18 PCA 18040 H:49]

BACKGROUND

HERD reviewed the document titled *Draft Screening-Level Ecological Risk Assessment for Sites 6, 12, 21, 24, 30, 31, 32, and 33 Naval Station Treasure Island, San Francisco, California,* dated August 14, 2006. This document was prepared by Sultech, A Joint Venture of Sullivan Consulting Group and Tetra Tech EM, Inc. of San Diego, California. This review is part of the continuing HERD review of methodology and Ecological Risk Assessment (ERA) for multiple sites on Treasure Island, the constructed portion of Naval Station Treasure Island.

HERD recently entered into discussions with the Navy to formalize the informal discussions and conclusions, among representatives of HERD, the U.S. EPA Region 9 and the U.S. Navy, regarding the necessity for a terrestrial Ecological Risk Assessment (ERA) for the Treasure Island (TI) portion of Naval Station Treasure Island (NAVSTATI). HERD participated in a meeting at NAVSTATI, on September 21, 2005, to clarify the original discussion, referenced as having occurred on June 3, 1994. Dr. James Polisini was the member of HERD who participated in the June 3, 1994 site visit along with Dr. Clarence Callahan of the U.S. EPA Region 9. Prior to the September 21, 2005 meeting HERD contacted Dr. Clarence Callahan, currently of the State of Hawaii Department of Health. The intent of the comments made by HERD and U.S. EPA Region 9 after the 1994 site visit to NAVSTATI, as recently confirmed with

Dr. Callahan, was that an extensive ERA need not be prepared for the more mobile terrestrial receptors (i.e., more mobile mammals and birds) which would preferentially utilize habitats at Yerba Buena Island rather than the 'developed' areas of Treasure Island.

In preparation for a March 10, 2006 conference call, HERD provided a review memorandum dated March 15, 2006 of the following electronic submittals:

1. *DTSC Screening Criteria (12-16-05).xls* – A tabular listing of California Toxic Rules for Enclosed Bays and Estuaries, National Recommended Water Quality Criteria (EPA, 2002), National Ambient Water Quality Criteria (NAWQC) as listed by the California Regional Water Board (California Water Board, 2000), the proposed TI aquatic screening criteria and the NAVSTATI ambient groundwater concentrations.
2. *Screening Benchmarks.xls* – A tabular listing of Ecological Soil Screening Levels (EcoSSLs) for plants, Oak Ridge National Laboratory (ORNL) soil screening concentrations for plants, EcoSSLs for soil invertebrates, ORNL invertebrate soil screening concentrations, EcoSSLs for birds, Toxicity Reference Value-Lows (TRV_{low}) for birds, EcoSSLs for mammals, TRV_{low} for mammals and inhalation TRV_{low} for mammals.
3. *TI Exposure Parameters.xls* – A listing of three tables of proposed exposure parameters for the American robin, the Ornate shrew and the deer mouse.
4. *Draft Eco Mtg Minutes.doc* – A draft version of the minutes of the September 21, 2005 meeting at NAVSTATI.

An informal habitat survey, referenced in this document as occurring during March, 2006, was one component necessary for the evaluation of potential ecological hazard for terrestrial receptors at Naval Station Treasure Island (NAVSTATI) and was reviewed in a HERD memorandum dated June 9, 2006. The document, reviewed in this memorandum, presents the evaluation of the maximum and 95 percent Upper Confidence Limit on the mean (95UCL) soil concentrations to criteria protective of plants, soil invertebrates, a selected avian species and a selected mammalian species.

Naval Station Treasure Island (NAVSTA TI) is situated midway between San Francisco and Oakland, California and consists of two contiguous islands. Yerba Buena Island (YBI) is a natural island. Treasure Island (TI) is an island constructed of dredged fill on top of a sand shoal extending from the northwest point of YBI. Treasure Island is approximately 403 acres. Clipper Cove is located between YBI and TI.

GENERAL COMMENTS

The material submitted fulfills the majority of the requirements discussed among the Navy and regulatory agencies regarding a screening-level ERA for a limited number of representative groups and species. The presentation of ecological hazard, as represented by the ecological Hazard Quotients (HQs), should be augmented to present ecological hazard relative to 'ambient'. Additional HQs based on observable effects and sample statistical summaries should be presented together with the total ecological hazard.

SPECIFIC COMMENTS

1. The photographs provided as documentation of the types of habitat observed during the March, 2006 habitat survey (Appendix B) are extremely valuable in documenting the NAVSTATI habitats at the sites under evaluation. A similar range of photographs should be included in any future ecological screening.

2. HERD previously reviewed informal submittals of the vertebrate Toxicity Reference Values (TRVs), the proposed hierarchy of environmental media evaluation criteria including the EPA Ecological Soil Screening Levels (EcoSSLs), and Oak Ridge National Laboratory (ORNL) Ecological Screening Levels (ESLs) and vertebrate exposure factors (e.g., body weight and ingestion rate). A subset of these values were checked and found to be in agreement with those previously agreed to or proposed for use. This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractor.

3. Some of the historical activities, remedial investigations and cleanup activities are not presented. For example, the description of IR Site 12 (Section 2.1.1.2, page 5) notes areas of 'fenced-off housing' and current land use of IR Site 12 (Section 2.1.2.2, page 9) is listed as residential; yet no mention is made of the polychlorinated biphenyl (PCB) investigation and removal action at IR Site 12. The result is that the PCB concentration detected at IR Site 12 is the incorporation of a soil PCB maximum concentration of 389 mg/kg (Table G-2) presented in the risk characterization for vertebrates (Section 3.2.2.3, page 34 and 36), resulting in HQs in excess of 1000 without comment. The 95 percent upper confidence limit on the mean (95UCL) IR Site 33 soil concentrations (Table G-16) for lead are 1868 mg/kg and 319.8 mg/kg for copper. The IR Site 33 chromium III and chromium VI concentrations are identical to 7 decinal places at 49.3939094 mg/kg (Table G-16) while no chromium VI results are reported in the data summary (Appendix C). The IR Site 6 maxima for hexavalent chromium is 78 mg/kg, ethylbenzene at 368 mg/kg, m,p-xylenes 420 mg/kg, naphthalene 120 mg/kg (Table G-1). Additional discussion must be presented in the risk characterization sections which provide the previous activities which resulted in obviously elevated concentrations, the results of any remedial investigations and the risk management decisions (e.g., remediation to concentrations protective of human health future use) relevant to site closure. Presentation of portions of the statistical summary (Appendix C), particularly the total number of samples and the frequency of detection should be included in the SLERA main text.

4. The original intent of this Screening Level Ecological Risk Assessment (SLERA) was to provide an estimation of the potential ecological hazard regardless of the future use of TI sites. The fact that exposure to plants and soil invertebrates is 'limited to species that can adapt to artificial and disturbance regimes' and 'the exposure of birds and mammals is primarily to opportunistic species adapted to urban, landscaped habitats' (Section 2.5.3, page 18) does not mean that exposure does not occur. All the exposure pathways displayed in the Conceptual Site Model (CSM) are indicated as 'minor transport routes'

with a dashed line (Figure 12) while exposure for vertebrate receptors is modeled as intake from soil, plant and animal tissue (Section 3.1.3, page 23 through 28). If the intent of designating all exposure pathways as minor is to convey the minimal exposure at developed, landscaped TI sites, relative to Yerba Buena Island (YBI) sites, that message is not obvious. The legend of this figure, with all exposure pathways indicated as minor, should be amended to indicate it applies to the landscaped TI sites and an additional figure should be inserted to present the pathways for which intake and hazard was estimated in the SLERA.

5. The No Observable Adverse Effect Level (NOAEL) Toxicity Reference Values-Low (TRV_{low}) jointly developed by the EPA Region 9 Biological Technical Assistance Group (BTAG) and the Navy were used in addition to the Oak Ridge National Laboratory (ORNL) NOAEL-based Toxicity Reference Values (TRVs) for evaluation of vertebrate hazard (Section 3.1.3.4, page 27). Use of NOAEL-based toxicity values, rather than Lowest Observable Adverse Effect Level (LOAEL) based toxicity values, should be emphasized by amending the table heading for the appropriate HQs (Section 3.2, page 28 through 60) to include the phrase 'NOAEL-based Ingestion Hazard Quotients Greater than 1.0 for the....'.

6. Inclusion of the ecological HQs based on the 95UCL in tables without discussion in the text (Section 3.1.1, page 21) is unacceptable. In particular, the site-specific summary tables of HQs exceeding one (HQ>1) (Section 3.2, page 28 through page 60) must be augmented to include a separate listing of Contaminants of Potential Ecological Concern (COPECs) for which the 95UCL concentration leads to a HQ greater than one.

7. The lack of a Lowest Observable Adverse Effect Level (LOAEL)-based TRV (TRV_{high}) HQ for the avian and mammalian representative species is puzzling, particularly as this comparison would provide an upper bound on the ecological hazard and is normally included in ecological assessments of Navy sites. HERD recommends that a TRV_{high}-based HQ be provided in the risk characterization tables (Section 3.2, page 28 through 60).

8. In addition to the maximum and the 95UCL-based HQ some presentation must be made for the concentration in excess of probable 'ambient' concentrations. Given that the TI component of NAVSTATI was constructed of 'dredge material from San Francisco Bay' (Section 2.6, page 20) estimates of San Francisco Bay 'ambient' sediment concentrations (SFEI, 1999) would seem a reasonable comparison to TI soil concentrations. As an example of this comparison for copper at IR Site 12 for the American Robin (Section 3.2.2.3, page 34), the 95UCL concentration is 92.04 mg/kg (Table G-10), the 40%-100% fines 'ambient' nickel concentration (SFEI, Table 4.5) is 68.1 mg/kg:

Chemical	95 UCL Concentration (mg/kg)	American Robin HQ	Sediment 'ambient' 40%-100% Fines Concentration (mg/kg)	Above 'ambient' Concentration (95 UCL – 40%-100% Fines) (mg/kg)	American Robin Approximate HQ above 'ambient'
Copper	92.04	3.13	68.1	23.94	0.81

In this same comparison for nickel at IR Site 12 for the American Robin (Section 3.2.2.3, page 34), the 95UCL concentration is 74.88 mg/kg (Table G-10), the 40%-100% fines 'ambient' nickel concentration (SFEI, Table 4.5) is 112 mg/kg and the IR Site 12 nickel 95UCL concentration is less than the sediment 'ambient' indicating no greater nickel hazard than that from potential 'ambient' exposure. A similar presentation of the relative ecological hazard must be presented in the SLERA.

9. Please correct the typographic error where plant HQs are indicated in the Invertebrate Section for IR Site 21 (Section 3.2.3.2, page 38, second paragraph).

CONCLUSIONS

Contingent on the concurrence of Ms. Sonce deVries, the regulatory representative who attended the March, 2006 habitat survey, the material supplied provides comparison of habitat sufficient to conclude that mobile vertebrate species would utilize YBI habitats preferentially over TI habitat at Sites 6, 12, 21, 24, 30, 31, 32 and 33.

The presentation of ecological hazard for plants, invertebrates and vertebrate species should be modified to provide some comparison of ecological hazard relative to probably 'ambient' concentrations, a LOAEL-based Hazard Quotient for vertebrate species, and additional discussion of site history, sample statistics and applicable site-specific risk management decisions.

HERD agrees with the recommendation (Section 2.6, page 20 and Section 5.0, page 67) that based on the current overall poor quality of the habitat on TI, further evaluation of the ecological hazard for Site 6, 12, 21, 24, 30, 31, 32 and 33 is not required. This agreement for no further TI ERA activity for these sites is contingent on incorporation of the additional risk characterization components outlined in the Specific Comments above.

Should use of any of these sites change in the future such that significant ecological habitat develops at the site, several sites, with elevated HQs, will require further evaluation of ecological hazard.

REFERENCE

SFEI. 1999. 1997 Annual Report: San Francisco Estuary Regional Monitoring Program for Trace Substances. San Francisco Estuary Institute, Oakland, CA. http://www/sfei.org/rmp/1997/tables/t04-05.htm

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