

**RESPONSES TO COMMENTS ON THE DRAFT SUBSURFACE VAPOR INTRUSION  
METHODOLOGY LETTER REPORT FOR PROPOSED ACTIVE SOIL GAS  
SAMPLING AT INSTALLATION RESTORATION SITE 17 AND BUILDING 503 AREA,  
MARE ISLAND NAVAL SHIPYARD, VALLEJO, CALIFORNIA  
OCTOBER 10, 2008**

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This document presents the Department of the Navy's (Navy) responses to regulatory comments from Carolyn d'Almeida from the U.S. Environmental Protection Agency (EPA) and John Christopher from the Department of Toxic Substances Control's (DTSC) Human & Ecological Risk Division (HERD) on the "Draft Subsurface Vapor Intrusion (VI) Methodology Letter Report for Proposed Active Soil Gas (ASG) Sampling at Installation Restoration Site 17 and Building 503 Area, Mare Island Naval Shipyard, Vallejo, California," dated September 12, 2008.

The comments addressed below were received from Ms. d'Almeida on September 22, 2008 and Dr. Christopher on September 24, 2008. The comments and responses are provided below.

**RESPONSES TO EPA COMMENTS**

1. **Comment:** Regarding the first set of risk calculations (detailed on the bottom half of p. 3): Toxicity values for these risk calculations should preferentially be obtained from the new table of Regional Screening Levels, a copy of which is enclosed. If a toxicity value is not listed in the RSL table, the OSWER hierarchy (2003) should be followed, with preference given to Cal/EPA OEHHA values. The most current guidance on regional Screening Levels is available at <http://epa-prgs.ornl.gov/chemicals/guide/shtml>.

**Response:** The user's guide for the regional screening level (RSL) table indicates that the 2003 EPA Office of Solid Waste and Emergency Response (OSWER) toxicity hierarchy was followed during development of the RSL table (EPA 2008). Regardless, the Navy will refer to the RSL table while compiling the toxicity values for this VI risk evaluation to ensure that toxicity values are consistent with those provided in the recent RSL table. Section 3.0 of the VI methodology will be revised to indicate that for the third tier of the OSWER (EPA 2003) hierarchy (that is, non-EPA sources), preference will be given to California EPA's Office of Environmental Health Hazard Assessment (OEHHA) toxicity values.

2. **Comment:** There is a typo in Table 1. The "Enclosed space floor thickness" value under "Hypothetical Future Industrial Building" should be 15 cm to be consistent with the 6 inch building foundation thickness noted under "Basis".

**Response:** Table 1 was revised to show the building foundation thickness for a commercial/industrial building will be based on the EPA (2002) default value of 10 centimeters (approximately 4 inches).

## RESPONSES TO DTSC HERD COMMENTS

1. **Comment:** The Navy should update the list of analytes to match the expanded list agreed upon with the agencies in a teleconference on 24 September.

**Response:** Sections 1.0 and 2.0 were revised to state that ASG samples will be analyzed for a full suite of volatile organic compounds (including 1,4-dioxane) and polycyclic aromatic hydrocarbons.

2. **Comment:** This methodology seems to state that the risk basis for the potential removal action will be based on the results of this sampling and assessment of the vapor intrusion pathway. The correct basis should be the sum of all risks and hazards via all complete pathways. This should entail making use of the assessment of other pathways, as shown in the remedial investigation for IR-17.

**Response:** The fourth sentence in the first paragraph of Section 3.0 of the VI methodology was revised as follows: "The VI risk calculated for each of the approximately 40 exposure points will be used to make risk management decisions, as needed, to address potential VI exposures for the 100-foot by 100-foot area surrounding each point."

The Navy collected ASG samples to estimate health risks associated with potential future VI exposure at the site. The recommendations of the engineering evaluation/cost analysis (EE/CA) will consider all site information and human health risk results previously presented in the remedial investigation (RI), in addition to the new VI risk evaluation results.

3. **Comment:** In my recent memorandum dated 23 September 2008 on the Sampling and Analysis Plan for this site, I presented two comments regarding vapor intrusion methodology and evaluating risk evaluation. I reproduce them here for the Navy's information:

a) **Source Term for Risk Assessment:** DTSC will be requiring that Johnson & Ettinger modeling be performed for estimating risks and hazards in indoor air due to volatile and semi-volatile organic chemicals. During a recent teleconference, DTSC did not receive a satisfactory answer when we asked for the identity of the source term for vapor intrusion modeling. The Navy should inform us if this will be shallow soil gas or the top of the groundwater column. If that choice is soil gas in this environment of just 6-8 ft to groundwater,

then safeguards must be identified to insure that samples are taken from the vadose zone, not the capillary zone, and not taken from a shallow depth as to be unduly influenced by atmospheric effects. In sampling under similar conditions at Alameda Island, a tracer gas is being used to monitor for breakthrough of atmosphere. We suggest the Navy and its consultants become familiar with the efforts at Alameda Island.

The Navy presents an acceptable hierarchy on page 3 for selecting the best source term, i.e., use soil gas as a source term if possible and groundwater if soil gas measurements fail for some reason. The various proposed default values are also acceptable. The Navy's document does not address cautions to take in the field for preventing atmospheric breakthrough or sampling within the capillary fringe. I refer them once again to recent efforts at Alameda Island.

**Response:** Analytical results of the ASG samples will be used as the source term for the VI modeling. The second paragraph of Section 2.0 of the VI methodology was revised to state the ASG samples were collected from the vadose zone, immediately above the capillary fringe zone. In addition, the Navy used a tracer gas (isopropanol) to test whether atmospheric break-through occurred during the ASG sample collection (see Section 17.2.5 of the sampling and analysis plan [SAP] [ChaduxTt 2008]).

- b) **Step 5, p. 31:** This step of the Data Quality Objectives describes comparing analytical results in soil, groundwater and soil gas to screening criteria, the Regional Screening Levels recently published in beta form by USEPA (2008). These criteria appear to be decision criteria for whether a removal action will be undertaken. This is the wrong document for developing risk-based decision criteria. Such development should properly be included in the Engineering Evaluation/Cost Analysis (EE/CA), which is to follow completion of this sampling event. In addition, the criteria selected are not publicly accessible, because they are described by USEPA as being in a stage of beta-testing. Additionally, USEPA is requiring assignment of a password for access to its website with the Regional Screening Levels. DTSC does not object to the use of Regional Screening Levels to aid in determining extent of contamination, but the inaccessibility of these criteria to the general public places limits on the transparency of the project.

HERD recognizes the need for the effort in the field to use screening criteria in determining extent of contamination. Nevertheless, the Navy should be aware that using RSL's for this purpose might suffer from lack of transparency and potentially inadequate protection of non-human species.

**Response:** Comment noted. The SAP was not intended to present risk-based cleanup goals upon which to base a soil removal. Rather, the objectives of the SAP were to collect viable soil and groundwater data for use during the EE/CA phase to determine the extent of free product at the site that would require removal and to collect ASG data to complete a VI risk evaluation for the site. If necessary, cleanup goals for these media will be developed during the EE/CA phase and will consider any potential uncertainties.

Although the SAP includes sampling in the upland area of the site, this area of the site was determined in the RI to be unsuitable habitat for ecological receptors (SulTech 2006). Future planned reuse of the upland area of the site is commercial/industrial, with current redevelopment plans including parking structures and surface parking lots. RSLs were used to ensure that laboratory analytical methods are adequate for the project objectives, which include protection of human health. Therefore, comparison of laboratory reporting limits to RSLs in Worksheet #15 of the SAP to assess the adequacy of the reporting limits is appropriate (ChaduxTt 2008). No changes were made to the VI methodology as a result of this comment.

## REFERENCES

- ChaduxTt. 2008. Sampling and Analysis Plan (Field Sampling Plan/Quality Assurance Project Plan) for Additional Soil, Groundwater, and Soil Gas Sampling Investigation at Installation Restoration Site 17 [IR17] and Building 503 Area, Former Mare Island Naval Shipyard, Vallejo, California. September 26.
- SulTech. 2006. "Final Remedial Investigation for IR17 and Building 503 Area, Investigation Area A1, Mare Island, Vallejo, California." January 27.
- U.S. Environmental Protection Agency (EPA). 2008. "Region 9 Regional Screening Levels." Available on-line at: <<http://www.epa.gov/region09/waste/sfund/prg/>>.

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