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TREASURE ISLAND
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DATE: October 19, 2012

SUBJECT: RESPONSES TO COMMENTS FOR DRAFT HUMAN HEALTH RISK ASSESSMENT ADDENDUM, INSTALLATION RESTORATION SITE 21, NAVAL STATION TREASURE ISLAND, SAN FRANCISCO, CALIFORNMIA

PCA: 18019 Site: 201210-18

DOCUMENT REVIEWED: Responses to Comments for Draft Human Health Risk Assessment Addendum, Installation Restoration Site 21, Naval Station Treasure Island, San Francisco, CA. Prepared for Department of the Navy, Base Realignment and Closure, Program Management Office West Naval Facilities Engineering Command, San Diego, California. Prepared by Shaw Environmental Inc., Concord, CA. Submitted October 11, 2012.

BACKGROUND (based on information in the submission): Naval Station Treasure Island (NSTI) Installation Restoration (IR) Site 21 is the former Vessel Waste Oil Recovery Area. Site 21 extends from the southeast corner of Building 3 to the southwest margin of TI and the San Francisco Bay, and comprises approximately 2.2 acres. In 2007, the Site 21 Remedial Investigation (RI) Report was finalized. Chlorinated volatile organic compounds (VOCs) including trichloroethylene (TCE), tetrachloroethene (PCE), dichloroethene (DCE), and vinyl chloride (VC) were identified as chemicals of concern (COCs) in groundwater.

A baseline human health risk assessment (HHRA) for Site 21 was conducted as part of the 2007 RI Report. Johnson and Ettinger (J&E) modeling of groundwater data identified potential risks to current and future receptors from the subsurface vapor

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intrusion to indoor air pathway. (Soil gas data were not available when the RI HHRA was conducted; and therefore, the indoor air evaluation was based on groundwater only.) To address concerns regarding groundwater contamination, a treatability study was initiated in 2005, with the last phase of treatment performed in early 2009 (no further in situ bioremediation treatment is currently planned). A Focused Feasibility Study (FFS) for Site 21 was prepared in 2008, and a Proposed Plan/Draft Remedial Action Plan (RAP) was published in 2011 identifying Alternative 2 from the FFS as the Navy's preferred alternative for Site 21. Alternative 2 consists of institutional controls (ICs) to: 1) Prohibit all uses of groundwater including groundwater extraction except for dewatering purposes, 2) Require evaluation and potential installation of engineering controls if new noncommercial buildings are constructed or the current land use of existing buildings changes, and 3) Prohibit residential use unless appropriate engineering controls are implemented that are protective of residential receptors.

In response to the request by regulators, the Navy collected soil gas data at Site 21 between 2010 and 2011 for use in further evaluating potential risk from the vapor intrusion pathway following the treatability study. VOCs were detected at concentrations exceeding preliminary soil gas screening levels, resulting in the collection of additional soil gas data between late 2011 and early 2012. In addition, the HHRA Addendum (reviewed herein) was prepared to evaluate the subsurface vapor intrusion to indoor and outdoor air pathways based on soil gas investigation at the site subsequent to the 2007 baseline HHRA.

At this time, Site 21 is fully covered by asphalt, concrete, and buildings. Building 3 is currently empty, but is occasionally used for movie productions. Building 111 is currently used to store antiques. There is also a sailing facility which supports sailing lessons for area youth and storage of boats and equipment. The 2011 Final Environmental Impact lists the proposed future uses of the portion of Treasure Island that includes Site 21 as open space and Island Center district (described as a dense mix of residential, retail, restaurant, and office space). The Environmental Impact Report states that Building 3 will be rehabilitated and reused for commercial, retail, entertainment, community services, and food production uses. Building 111, an ancillary building attached to Building 3, will be demolished. Portions of Site 21 will be used for mixed use including residential.

B. Davis of HERO previously reviewed the soil gas screening criteria for Site 21 in a memorandum dated October 24, 2011. In a memorandum dated February 14, 2012, HERO reviewed the Draft Response to Comments on the Proposed Parameters and Soil Gas Evaluation for Site 21 (T. Behrsing to R. Sunga). In a memorandum dated September 4, 2012, HERO reviewed the Draft HHRA Addendum for Site 21 dated July 2012.

SCOPE OF REVIEW: Our review focused on Navy responses to HERO's September 2012 comments. We defer to USEPA, the San Francisco Regional Water Quality Control Board (RWQCB), ToxStrategies on behalf of the Treasure Island Development Authority

(TIDA), and the Naval Station Treasure Island Restoration Advisory Board (RAB) regarding the adequacy of Navy responses to their comments. We assume that regional personnel have evaluated the sampling methods for environmental media, the adequacy of site characterization, analytical chemistry methods, and quality assurance procedures. Any future changes to the submission should be clearly identified.

GENERAL COMMENTS

1. In general, HERO concurs with the Navy's Responses, and appreciates the updates which will be made to the document to address the comments. Below are remaining issues for which HERO does not necessarily agree with the Response, or for which we have additional comments. (No response is needed.)

2. Response to General Comment 2b. HERO concurs with the revisions which will be made to the document in response to HERO's comment on this issue. While no further response is needed, as a point of clarification we note that DTSC generally does not use California Human Health Screening Levels (CHHSLs) as "subslab soil gas screening levels." The attenuation factors used to derive the CHHSLs for shallow soil gas are less conservative than DTSC default subslab attenuation factors. (No response is needed.)

3. Response to General Comment 3aii. While we agree that the text should be modified, the Response does not specifically state that the current reference to a 6.75-fold difference in noncancer inhalation criteria for PCE will be deleted. Please ensure the text and footnotes accurately reflect differences between USEPA and CalEPA toxicity criteria for this constituent. While use of the recent USEPA reference concentration (RfC) for PCE would not significantly change the noncancer hazard calculations, use of the USEPA inhalation cancer criterion would have a significant effect. HERO will review the revised text and footnote upon receiving the revised document.

4. Response to General Comments 6, 7, 8, and 9 (Subslab and Subsurface Soil Gas RBSLs for Vapor Intrusion to Indoor Air). DTSC has recommended using a default attenuation factor of 0.05 to derive RBSLs for subslab samples, for consistency with DTSC's 2011 Vapor Intrusion Guidance and recommendations at other military facilities. Subsequent to HERO's review, D. Gallagher (DTSC geologist who has been closely involved in DTSC's vapor intrusion guidance) also provided subsequent comments on this issue in an email dated September 27, 2012. Finally, comments by G. Hiatt of USEPA indicate a general concurrence with HERO's comments, with the issues raised by HERO regarding vapor intrusion attenuation factors (comments 6, 7, 8, 9, and 10) considered to be especially pertinent and important.

   a. Despite DTSC recommendations, the Navy's Response appears to indicate that the document will not be updated in this regard other than to incorporate additional

discussion of the rationale used by the Navy to derive their subslab attenuation factors (which are less conservative than DTSC's default).

b. DTSC continues to disagree with the Navy on this issue, and additional comments on spatial and temporal variability of both subslab and indoor air contaminants, necessitating the use of conservative screening approaches, are provided by D. Gallagher in Attachment A for reference. Unless the document is updated per DTSC recommendations, HERO plans to present risk estimates based on DTSC's default subslab attenuation factor in our review of the final document. We recommend that risk assessment results based on the DTSC default be considered when making risk management decisions at the site. For reference, under the current commercial/industrial (C/I) scenario, even using the Navy's preferred attenuation factor (which is 2-fold less protective than the DTSC default), the maximum risk and noncancer hazard index (HI) for current C/I workers are 3E-5 and 3, respectively. Because the noncancer HI exceeds one, this indicates that a potential human health risk exists minimally at one subarea within the site (location 21-SG-27 which is located within the boundary Building 3).

5. Response to General Comment 12 iii (Current and Future C/I Scenarios). Please see General Comment 4 above. HERO continues to be concerned with the document's recommendation for institutional controls (ICs) to prevent residential use only.

a. Using even the Navy's preferred attenuation factor, the maximum noncancer HI exceeds one at Building 3, and only a single soil gas sampling event has occurred at this particular probe (21-SG-27; February 2012). DTSC's 2011 vapor intrusion guidance states that when evaluating subslab soil gas for a building, permanent sampling points should be installed so that repeated sampling can be conducted, as necessary, to evaluate seasonal or temporal variations. At a minimum, two subslab sampling events are warranted before a final risk determination is made.

b. While the current submission only identified one location with a C/I HI exceeding one, use of the DTSC default subslab attenuation factor could identify other areas as well. There are also concerns since guidelines for evaluating short-term exposures to TCE (the C/I noncancer risk driver, which is a cardiac teratogen) are still being developed. These issues need to be considered by the risk manager.

c. As noted above, HERO will provide risk estimates based on the DTSC default subslab attenuation factor in our review of the final document, unless the submission is updated in this regard. HERO continues to recommend discussion on the need for additional evaluation of this exposure pathway under the current and future C/I scenario in areas where significant VOC concentrations have been detected. This could potentially include additional soil gas monitoring, groundwater J&E modeling using current concentrations and toxicity criteria, and/or indoor air sampling. Limited indoor air sampling at Building 3, rather than further discussion on appropriate subslab attenuation factors, may be a more efficient path forward on this issue.

CONCLUSIONS

HERO has reviewed the Navy's Responses to HERO comments on the Draft Human Health Risk Assessment Addendum for Installation Restoration Site 21, Naval Station Treasure Island, San Francisco, CA. In general, HERO concurs with the responses and recommended revisions to the document to address our concerns. The primary remaining issue for which HERO does not concur with the Navy's response is the selection of subslab attenuation factors which differ from DTSC's default value. Unless the document is updated per DTSC recommendations, in our review of the final document HERO will present risk estimates based on DTSC's default subslab attenuation factor. These estimates should be used in making risk management decisions. For the current commercial/industrial scenario, even using the Navy's preferred attenuation factor (which is 2-fold less protective than the DTSC default), the maximum risk and noncancer HI for current C/I workers are 3E-5 and 3, respectively. Because the noncancer HI exceeds one, this indicates that a potential human health risk exists at a subarea within the site. We are concerned in this regard given the document's recommendation for institutional controls to address future residential receptors only.

Reviewed by: Michael J. Wade, Ph.D., DABT
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Cc: D. Gallagher
DTSC

Attachment A – Comments from D. Gallagher of DTSC

Subslab screening with a conservative approach is appropriate for Commercial buildings. A conservative approach is necessary due to temporal and spatial variability of both indoor and subslab contaminant concentrations. The scientific literature clearly documents that variability exists and conservative screening is warranted due to the challenge of obtaining samples representative of long-term site conditions. As indoor air concentrations change within a building, subslab attenuation factors will also change.

Indoor Air Radon Variability

The scientific literature provides the following documentation on the variability of indoor air based on radon studies:

1. Rydock and others (2001) measured radon concentrations in a school and day-care center in Norway for eight days. Ventilation systems operated in the buildings during the day. Radon concentrations varied by a factor of 35 for the school and a factor of 130 for the day-care center over the eight-day measurement period.

2. The University of Minnesota (Hadlich and Grimsrud, 1994) studied the energy efficiency of approximately 200 campus buildings. Radon concentrations were measured when ventilation systems were operating and shutdown. Of the two buildings highlighted in the study, Wulling Hall and Biological Sciences, radon concentrations varied by a factor of five over the study period of six months and eight days for the two buildings, respectively.

3. Sheets (1992) studied radon progeny in four homes in Missouri. Indoor air concentrations varied by a factor of two over the day-long study period. Sheets noted a correlation between indoor air quality and outdoor temperature. The residential structures were tested during normal building operating conditions.

4. Chavez and Segovia (2002) measured radon in a laboratory in Mexico City that is naturally vented. Measurements over one month indicate that radon concentrations in indoor air vary by a factor of five.

5. Miles (2001) evaluated radon migration in numerous buildings. A house in Frankfurt was monitored for a year and radon varied by a factor of about six, which is close to the average response of homes within the United Kingdom. Also, a school in Wales had radon variability of a factor of 500 over the three week sampling period and the high variability was attributable a particular wind direction.

Indoor Air Variability of Volatile Contaminants

The following studies document the variability of volatile chemicals in indoor air as related to vapor intrusion:

1. Johnson and others (2012) monitored indoor air in a home over TCE-impacted groundwater emanating from Hill Air Force Base. Indoor air samples were collected every two to four hours for two years. TCE concentrations in indoor air varied by two orders of magnitude during the sampling period. The home was operated normally during the two years.

2. Lutes and others (2012) monitored indoor air in a duplex with a basement near a dry cleanser in Indianapolis for one year. TCE and chloroform concentrations in indoor air varied by one order of magnitude during the sampling period. The home was operated normally during the one year test period.

Subslab Variability of Volatile Contaminants

The following studies document the variability of volatile chemicals in subslab samples:

1. Johnson and others (2012) indicate that subslab TCE concentrations vary by an order of magnitude, both spatially and temporally, at the home offsite from Hill Air Force Base.

2. Lutes and others (2012) indicate that subslab PCE and chloroform concentrations vary by an order of magnitude, both spatially and temporally, at the home in Indianapolis near a dry cleanser.

References

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