
Los Angeles Regional Water Quality Control Board

August 30, 2016

Ms. Carol Devier-Heeney
DLA Installation Support – Energy
8725 John J. Klingman Road
Fort Belvoir, VA 22060

Mr. Steve Defibaugh
Kinder Morgan Energy Partners
1100 Town and Country Road
Orange, California 92868

SUBJECT: REVIEW OF HUMAN HEALTH RISK ASSESSMENT FOR NO FURTHER ACTION DETERMINATION FOR SHALLOW SOIL AT THE EASTERN 15-ACRE PARCEL SHALLOW SOIL

CASE/SITE: DEFENSE FUEL SUPPORT POINT NORWALK, 15306 NORWALK BOULEVARD, NORWALK, CALIFORNIA (SCP NO. 0286A/B, SITE ID NOS. 16638 AND 204DM00)

Dear Ms. Devier-Heeney and Mr. Defibaugh:

The California Regional Water Quality Control Board (Regional Board), Los Angeles Region, is the public agency with primary responsibility for the protection of ground and surface water quality for all beneficial uses within major portions of the Los Angeles and Ventura Counties. The Regional Board received the following technical documents related to the eastern 15-acre parcel shallow soil closure of the above-referenced site (Site) to facilitate land conveyance to the City of Norwalk:

- *Shallow Soil Closure Report DLA-Energy Responsible Area of the Eastern Portion*, April 18, 2016, The Source Group, Inc.
- *Addendum to Shallow Soil Closure Report for the DLA-Energy Responsible Area of the Eastern Portion*, May 31, 2016, The Source Group, Inc.
- *Human Health Risk Assessment DLA-Energy Responsible Area of the Eastern Portion*, May 31, 2016, The Source Group, Inc.
- *Request for No Further Action – Shallow Soil, SFPP Norwalk Pump Station*, March 25, 2014, CH2M
- *Results of Additional Soil and Soil Vapor Sampling and Human Health Risk Assessment to Support Shallow Soil Closure for the Eastern 15-Acre Parcel*, Defense Fuel Support Point, June 28, 2016, CH2M

The Office of Environmental Health Hazard Assessment (OEHHA) reviewed technical documents related to human health risk assessment and provided August 2, 2016 Memorandums (copies attached) to the Regional Board. We have reviewed the OEHHA Memorandums and have the following comments:

1. For OEHHA review and Regional Board's no further action determination of the Site's eastern 15-acre parcel, human health risk assessment should cover the entire 15-acre parcel that is to be conveyed. However, technical documents prepared by CH2M did not present a geographical boundary for human health risk assessment and the Regional Board's no further action determination within the Site's eastern 15-acre parcel where Kinder Morgan Energy Partners (KMEP) is responsible for investigation and cleanup. For further evaluation by OEHHA and the Regional Board's no further action determination to facilitate the 15-acre parcel conveyance, KMEP should revise the human health risk assessment to include a clear geographical boundary with supporting investigation results for soil, soil vapor, and groundwater. If any areas are not covered by human health risk assessment within the Site's eastern 15-acre parcel, the Regional Board cannot grant a no further action determination for the entire eastern 15-acre parcel. We recommend a discussion between Defense Logistics Agency and KMEP to develop technical documents covering the entire 15-acre parcel to facilitate land conveyance to the City of Norwalk.
2. For further evaluation by OEHHA, we require that Defense Logistics Agency and KMEP revise their human health risk assessment to address OEHHA comments.

Submit the revised human health risk assessment incorporating the above comments to the Regional Board by **October 15, 2016**.

If you have any questions, please contact me at (213) 576-6721 or paul.cho@waterboards.ca.gov.

Sincerely,



Paul Cho, P.G.
Site Cleanup Unit V

Attachments OEHHA Memorandum, Human Health Risk Assessment DLA-Energy Responsible Area of the Eastern Portion Facility, August 2, 2016

OEHHA Memorandum, Results of Additional Soil and Soil Vapor Sampling and Human Health Risk Assessment to Support Shallow Soil Closure for the Eastern 15-Acre Parcel, Kinder Morgan, August 2, 2016

cc: See Mail List

Mail List

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Office of Environmental Health Hazard Assessment



Matthew Rodriguez
Secretary for
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Edmund G. Brown Jr.
Governor

MEMORANDUM

TO: Paul Cho
Engineering Geologist
Site Cleanup Unit V

FROM: Nathalie Pham, Ph.D. *N.P.*
Staff Toxicologist
Integrated Risk Assessment Branch
Office of Environmental Health Hazard Assessment

DATE: August 2, 2016

SUBJECT: HUMAN HEALTH RISK ASSESSMENT – DLA – Energy Responsible
Area of the Easter Portion Facility, Defense Fuel Support Norwalk, 15306
Norwalk Boulevard, Norwalk, CA

R4-15-077

OEHHA # 880422-00

Document reviewed

- Human Health Risk Assessment, Defense Fuel Support Point Norwalk, 15306 Norwalk Boulevard, Commerce, CA dated May 31, 2015 by Apex.

Scope of the Review

- An accurate health assessment depends on adequate site characterization. A human health risk assessment must be able to capture all potential exposures. It must be able to identify whether soil and soil gas data were screened with appropriate cleanup goals and acceptable screening levels. Samples must be handled in a manner to prevent loss prior to analysis and must be analyzed by appropriate methods for toxic chemicals likely to be at the site.

Conceptual Site Model (CSM)

- The primary pathway of exposure was through inhalation of vapors generated from the subsurface.

- Inhalation, ingestion, and dermal contact to soil were other potential pathways of exposure.
- The risk assessment was based on a target cancer risk of 1×10^{-5} for future commercial, recreational, and construction use.
 - Although a target cancer risk of 1×10^{-6} for future residential use was selected by the Water Board, the report does not support uses for a residential purpose. If land use changes, additional evaluation of potential health risks may be necessary

Chemicals of Potential Concern (COPCs)

- TPHs and VOCs are the primary COPCs at the Site.

General Comments

- It is unclear why there are overlapping categories of TPH carbon range (C23-C32, C23-C44, and C33-C44).

Soil Exposure Risk Assessment

- The soil screening levels used in Table 1 are tier 1 ESLs (SFRWQCB, 2016). These values are based on unrestricted land use and are more conservative than tier 2 levels based on direct exposure to human health.
- Table 1. The number of samples and the number of detections for the VOCs (columns 3 and 4 from the left) are incorrect.
 - It should be clearly stated in column 4 if there are zero detections for VOCs.
 - Column 6 from the left is also incorrect. The arithmetic mean cannot be higher than the maximum detected concentration.
 - In Table A-2, OEHHA found multiple concentrations above the listed maximum detected concentration for acetone in Table 1. Please check accordingly for other VOCs.
 - The values listed as maximum detected concentrations for the VOCs are incorrect in Table 1. Table A-2 has the same values listed as the mean, not the maximum concentration. Maximum = mean only if all values are the same.
- The site-specific cleanup goals for the TPH ranges are inconsistent between Table 1 and Table A-1. OEHHA recommends further transparency.
 - Soil screening levels for specific TPHs carbon ranges are not included in the reference cited (SFRWQCB, 2016). Please clarify how those ranges were deduced to match the screening levels for gasoline and diesel.
- It is a risk management decision whether or not to accept SFRWQCB levels for application to the Site. Other resources like DTSC Note 3, EPA RSLs, or OEHHA CHHSLs also provide soil screening levels.
- OEHHA checked the maximum detections for the soil COPCs and found them to be under CHHSLs and/or RSL.

- The combined (cumulative) risks and hazards were not assessed.
 - The sum of hazard quotients should be <1.

Soil Vapor Risk Assessment

- Table 2, soil gas at 5' bgs. The EPC selected for each COPC was the minimum detected concentration, not the maximum detected concentration.
 - The maximum detected concentrations for all COPC are still below the screening levels and therefore does not impact the overall conclusions.
- Benzene levels detected at 10' bgs exceed residential screening levels (SFRWQCB, 2016).
- OEHHA checked all soil vapor EPCs in Tables 2 and 3, and found them to be below CHHSLs.
- Cumulative risks and hazards for soil vapor for this site were not assessed.

Editorial Comments

- Page 4-1. The definition of exposure point concentration (EPC) is not entirely accurate (the average chemical concentration in an environmental medium).
 - An EPC may also represent the maximum detected concentration depending on the nature of the exposure, the number of samples, and chemical distribution. A more appropriate definition may be that the most realistic estimate of an EPC is by using the 95 percent upper confidence limit (95UCL) of the average concentration for each COC if sufficient data are available.

Conclusions

- The soil vapor levels are below the screening levels of the guidance presented in this report as well as under the CHHSLs.
- Although OEHHA found the soil EPCs to be below screening levels, OEHHA recommends Table 1 be heavily revised. There are numerous errors and inconsistencies that attribute to a lack of transparency for this risk assessment.
- An assessment for the noncancer risks (hazards) therefore the level of noncancer adverse effects for this site is unclear.

Please do not hesitate to contact me at (916) 327-7338 or by e-mail at Nathalie.Pham@oehha.ca.gov, if you have any questions related to this review.

Memo reviewed by

J. Carlisle

James C. Carlisle, D.V.M., M.Sc.,
Staff Toxicologist

References

DTSC, 2011. Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). Department of Toxic Substances Control, California Environmental Protection Agency, October, 2011.

US EPA, 1996. Soil Screening Guidance: User's Guide. Office of Solid Waste and Emergency Response, July 1996.

SFRWQCB, 2016. Environmental Screening Levels Workbook. SF Bay Regional Water Quality Control Board, California Environmental Protection Agency, February 2016.

Office of Environmental Health Hazard Assessment



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MEMORANDUM

TO: Paul Cho
Engineering Geologist
Site Cleanup Unit V

FROM: Nathalie Pham, Ph.D. *N.P.*
Staff Toxicologist
Integrated Risk Assessment Branch
Office of Environmental Health Hazard Assessment

DATE: August 2, 2016

SUBJECT: RESULTS OF ADDITIONAL SOIL AND SOIL VAPOR SAMPLING AND HUMAN HEALTH RISK ASSESSMENT TO SUPPORT SHALLOW SOIL CLOSURE FOR THE EASTERN 15-ACRE PARCEL – Kinder Morgan / SGP – Norwalk Tank Farm, Defense Fuel Support Point Norwalk, Norwalk, CA

R4-16-001

OEHHA # 880423-00

Document reviewed

- Summary of Results of Additional Soil and Soil Vapor Sampling and Human Health Risk Assessment, Defense Fuel Support Point Norwalk, Norwalk, CA dated June 28, 2016 by CH2M.

Scope of the Review

- OEHHA reviewed the document to assess the extent of soil and soil vapor sampling and the analytical results at the Site. Many HHRA components are not provided in this document (conceptual site model, regional geology, site history and current use, screening level assessment, uncertainties, recommendations,

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etc.), but are included in previous reports. The area of concern is the Eastern 15-Acre Parcel of the SFPP Norwalk pump station.

- An accurate human health assessment depends on adequate site characterization and must be able to capture all potential exposures. It must be able to identify whether soil and soil gas data were screened with appropriate cleanup goals and acceptable screening levels. Samples must be handled in a manner to prevent loss prior to analysis and must be analyzed by appropriate methods for toxic chemicals likely to be at the site. As a standalone report, this report does not accomplish these goals.

Conceptual Site Model (CSM)

- The CSM is not included in the submitted report for review. However, CH2M provided OEHHA with an additional report (CH2MHill, 2013) covering the conceptual site model.
- Exposure pathways include potential inhalation of vapors of LNAPLs and sorbed-phase chemicals in on-site groundwater and on-site soil.
- Target scenarios are not explicitly defined in reports. It is implied that scenarios include current and future residential, commercial, and construction workers.

Chemicals of Potential Concern (COPCs)

- COPCs for this Site are VOCs, TPH, and metals.

General Comments

- There are five soil and three soil vapor sampling locations in an area of 60,000ft². If the most northern perimeter is at GMW-SF-10, the area would still be about 40,000ft².
 - The limited number of sample locations may not capture all significant contamination in the area of concern. Besides the ten groundwater monitoring wells, there is no evidence that any other previous sampling had taken place within the area.
 - It is unclear what "PZ" for sampling locations stood for.

Soil Assessment

- The report indicates that soil analytical results for metals are compared to DTSC's screening levels (DTSC, 2016), CHHSLs, or EPA's RSLs if the former two were unavailable.
- Soil analytical results for TPH and VOCs are compared to the cleanup goals provided by the 1996 RWQCB Interim Site Assessment and Cleanup Guidebook.
 - COPC detections in soil are below cleanup goals. OEHHA recommends more updated screening levels.

- OEHHA compared the soil concentrations for COPCs with available CHHSLs and DTSC's screening levels. Screening levels for those COPCs are not exceeded.
- The five soil sampling locations are more than 100' apart from each other. As mentioned previously, potential hot spots may be overlooked with this distance between single sampling locations.

Soil Vapor Assessment

- The rationale for the number and location of the samples is not given.
 - It should be noted that overall variability of concentrations from a single sampling event may contribute to the potential underestimation of risk.
 - The western side of the Eastern parcel (the area of concern) is not sampled for soil vapor COPCs.
 - Typically, a 100-foot buffer zone beyond the extent of the soil gas plume should be demonstrated at a Site (DTSC, 2011). This 100-foot buffer is warranted due to uncertainty about future soil gas migration upon redevelopment.
 - In addition, for a residential scenario, there should ideally be a minimum one soil gas sample location for every potential residential building. For comparison, the parcel size for most residential housing tracts in California is approximately one-eighth to one-quarter acre. Hence, the density of soil gas collection for future residential developments should be based on this type of spacing.
 - Bear in mind that the area of concern is 15 acres.
- Out of the three soil vapor locations, only one is analyzed for PAHs or PCBs. Please explain.
- Please clarify justification for not using the Johnson & Ettinger model to evaluate vapor intrusion of VOCs.
 - Table 7 results are from EPA's Petroleum Vapor Intrusion model, but there are no calculations to show the derivation of these results.
 - OEHHA used the J&E model to evaluate the potential risks from vapor intrusion using the COPC groundwater detections from Table 7:

<u>Chemical</u>	<u>Groundwater concentration (ug/L)</u>	<u>Risks</u>	<u>Hazards</u>
benzene	5700	7.6E-03	2.3E+02
toluene	15000	na	6.6E+00
ethylbenzene	4600	6.0E-04	6.5E-01
xylenes	36000	na	3.3E+01
mtbe	2800	3.2E-06	1.1E-02

- Groundwater concentrations were based on those detected at GMW-O-15. Please explain why concentrations from this particular monitoring well (and not others) were chosen.
- A current SFPP remediation system is mentioned in the Conclusions of the report, but the types of controls are not explicitly stated or described.

Editorial Comments

- Page 4 of the report states “one ambient air sample was collected on each day of sampling and analyzed.”
 - The language indicates that there may be more than one sample collected, but only one ambient air sample is shown in Table 6.

Conclusions

- Although soil samples are below cleanup levels, the limited number and location of soil sampling probes may have overlooked areas of significantly high COPC concentrations.
- OEHHA recommends more clarification and justification for soil vapor sampling locations and analysis.
- Further information should be provided on how vapor intrusion risks were calculated by CH2M. OEHHA calculated the risks and hazards using groundwater concentrations and found significantly high risks and hazards.

Please do not hesitate to contact me at (916) 327-7338 or by e-mail at Nathalie.Pham@oehha.ca.gov, if you have any questions related to this review.

Memo reviewed by

Regina Linville

Regina Linville, PhD,
Staff Toxicologist

References

DTSC, 2011. Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). Department of Toxic Substances Control, California Environmental Protection Agency, October, 2011.

US EPA, 1996. Soil Screening Guidance: User's Guide. Office of Solid Waste and Emergency Response, July 1996.

Paul Cho
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CH2M HILL (CH2M). 2013b. Conceptual Site Model and Proposal Alternate Interim Remedy for Soil, Groundwater, and LNAPL, Defense Fuel Support Point Norwalk, California. September 3.

CH2M HILL (CH2M). 2015. Results of Additional Soil Sampling to Support Shallow Soil Closure, SFPP Norwalk Pump Station, Norwalk, California. December 16.

CH2M HILL (CH2M). 2016. Results of September 2015 Soil Vapor Monitoring at the South-Central and Southeastern Areas of the SFPP Norwalk Pump Station, Norwalk, California.