Department of Toxic Substances Control

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December 15, 2017

Mr. Greg Haet
EH&S Associate Director, Environmental Protection
Office of Environment, Health & Safety
University of California, Berkeley
University Hall, 3rd Floor, #1150
Berkeley, California 94720

Dear Mr. Haet:

The Department of Toxic Substances Control (DTSC) received the *Draft 2017 Groundwater Sampling Results Technical Memorandum* (Memorandum), dated September 15, 2017, for the Richmond Field Station Site located in Richmond, California. The Memorandum was prepared by Tetra Tech, Inc. on behalf of the University of California, Berkeley, and presents a summary of water level measurements collected in October 2016 and April 2017, and a groundwater sampling event in April 2017. The groundwater monitoring was performed in accordance with the *Final Removal Action Workplan, Proposed Richmond Bay Campus, Research, Education, and Support Area and Groundwater within the Richmond Field Station,* dated July 18, 2014. DTSC has reviewed the Memorandum and has the following comments:

1) Page 7, Section 4, Hydrogeology: The fourth paragraph on page 7 states:

"A localized variation in the groundwater gradient had been identified near location B150, where the groundwater elevations were higher than in nearby piezometers from 2010 through spring 2016. Although this mound was present in April 2017, it was slightly smaller as indicated by the concentric groundwater contours around location B150 shown on Figure 17. Water levels in the area suggest there may be an artificial source of water from nearby irrigation, landscape maintenance, or other leaky pipes. A decrease in the mounding had been observed since the initial groundwater elevation measurements and it was not present in October 2016. However, in April 2017, this groundwater mound reappeared."

Based on *Figure 18 Geologic Cross-Section A-A'*, this mounding effect may be due to an upward vertical gradient in the area around wells B121 and B150 (and at other locations on site). Hydraulic pressure heads may reflect groundwater flow from a lower incised valley (coarse-grained sediments of a former stream channel) to the uppermost water-bearing unit, as shown on the *Figure 18 Geologic Cross-Section* as clayey gravel around well B121.

Further analysis and evaluation of the differences in the groundwater's physical parameters from each well/piezometer (i.e., specific conductance, pH, temperature, oxidation/reduction potential, etc.) and geochemistry (cation/anion) in the area may assist with understanding whether an upward hydraulic gradient is causing a groundwater mound. Plotting existing data on charts may show key differences between the wells to support an upward mounding hypothesis. Collecting groundwater samples from key wells for cation/anion analysis during the upcoming April 2018 monitoring event would provide useful data for evaluating the proposed groundwater mound hypothesis.

2) Page 14, Section 6.3: Figure 18, (geological cross-section A – A') is referenced in the tetrachloroethene and vinyl chloride discussions as depicting groundwater concentrations. Correct the reference to Figure 20.

3) Page 17, Section 7.1, Analysis of Results and Screening Levels: The second paragraph of this section states:

"The 2016 and 2017 data were compared with the previous three most recent events and the California and federal water quality criteria, and Berkeley Global Campus risk-based concentrations. In all chemicals, one-half of the California or federal MCL represents the most stringent screening criteria. Results indicate that one piezometer, B175W, meets the criteria to eliminate VOC sample analytes."

The elimination of wells from the groundwater monitoring program based on analytical results alone is not recommended because non-detect analytical results are critical for demonstrating the effectiveness of the remedial action and protectiveness of downgradient receptors.

DTSC understands that this methodology has been the acceptable practice in years past; however, this is a dynamic system and fluctuations in analytical results is likely in the future. The elimination of groundwater sampling from piezometers in strategic locations is problematic because the results are critical for demonstrating the current conditions and the effectiveness of the remedial action as well as protectiveness of downgradient receptors. Instead, DTSC would consider reducing the monitoring frequency, e.g., switch from an annual to biennial sampling schedule. Eliminating wells altogether from all future monitoring events is therefore, not recommended.

4) Page 17, Section 7.2, Recommended Analysis for 2018: The first paragraph of this section states:

"Table 11 summarizes piezometers and analytes recommended for sampling in 2018 and also identifies which piezometers sampled in 2017 are not recommended for further sampling in 2018."

DTSC would agree to reduction in those piezometers identified from an annual to biennial basis rather than eliminating piezometers altogether, as non-detect analytical results demonstrate the protectiveness of downgradient receptors. Sampling of those piezometers would not occur in April 2018, but would be done in April 2019.

5) Figure 17, Shallow Groundwater Elevation Contours, April 3, 2017: Add the groundwater elevations from the IMW- wells collected from the adjacent Zeneca/Former Stauffer Chemical Site to this figure and modify the elevation contours.

6) Appendix D, Water Level Measurement Sampling Forms: The note in the comments section of the Groundwater Measurement Logs for the well B280 A indicates, "PVC has heaved/risen – plug cannot go on when closing cover", and for well PZ8 the comment says, "well & casing broken". Additionally, many of the wells were noted to not have locks, or the condition of the locks was rusty. According to the California Department of Water Resources Bulletin 74-90 (June 1991), the owner of a well shall properly maintain monitoring wells.

Part II, Section 10. Surface Construction Features. States:

A. Locking Cover. "Surface construction features of a monitoring well shall serve to prevent physical damage to the well; prevent entrance of surface water, pollutants, and contaminants; and prevent unauthorized access".

B. Casing Cap. "The top of a monitoring well casing shall be fitted with a cap or "sanitary seal" to prevent surface water, pollutants, or contaminants from entering the well bore. Openings or passages for water level measurement, venting, pump power cables, discharge tubing, and other access shall be protected against entry of surface water, pollutants, and contaminants".

A section should be added to future Memorandum describing well inspection activities, the condition of wells that required repair or maintenance, and the repair/maintenance activities that were completed.

Submit a revised Memorandum with the requested changes within 60 days of the date of this letter. If you have any questions, please contact Lynn Nakashima at (510) 540-3839 or lynn.nakashima@dtsc.ca.gov.

Sincerely,

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