

2017 Groundwater Sampling Results Technical Memorandum
University of California, Richmond Field Station
September 15, 2017

Response to Comments
Department of Toxic Substances Control, Dated December 15, 2017

UC Berkeley Ref. No.	Page / Sect No.	DTSC Comment No.	DTSC Comment	UC Berkeley Response
1	Page 7, Section 4, Hydrogeology	1	<p>The fourth paragraph on page 7 states:</p> <p>"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."</p> <p>Based on <i>Figure 18 Geologic Cross-Section A-A'</i>, 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.</p> <p>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.</p>	<p>The following text has been added to the discussion of the observed groundwater mounding near B150:</p> <p>"The mounding may also be the result of an upward vertical gradient caused by the differences within localized geologic units. For example, coarse-grained sediments from former stream channel could result in a vertical hydraulic gradient observed as a groundwater mound."</p> <p>The determination of the specific cause of the observed mounding will not have an effect on the future sampling activities or recommendations; therefore additional and unnecessary efforts towards this end is not recommended.</p>
2	Page 14, Section 6.1	2	<p>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.</p>	<p>Text has been corrected to identify Figure 20 as the appropriate reference.</p>

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3	Page 17, Section 7.1, Analysis of Results and Screening Levels	3	<p>The second paragraph of this section states:</p> <p>"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."</p> <p>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.</p> <p>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.</p>	<p>UC Berkeley concurs with reducing the monitoring frequency of the recommended changes to biennial basis.</p> <p>Text has been amended to clarify that the evaluation is conducted in order to evaluate future analytes; text referring to "the criteria to eliminate" has been removed. Text has been clarified that the recommendations for reduced monitoring at the noted piezometers will be implemented in 2018 and that the 2019 sampling plan will be conducted consistent with the 2017 sampling parameters, or as otherwise required by DTSC's 5-Year Review recommendations to be developed in 2019.</p> <p>UC Berkeley does not concur with the comment that the RFS is under a dynamic system and that fluctuations in analytical results are likely in the future. Nine rounds of groundwater monitoring data results indicate a stable groundwater environment without significant fluctuations in groundwater concentrations.</p>
4	Page 17, Section 7.2, Recommended Analysis for 2018	4	<p>The first paragraph of this section states:</p> <p>"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."</p> <p>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.</p>	<p>Section 7.2 and Table 11 have been clarified that the recommendations for reduced monitoring at the noted piezometers will be implemented in 2018 and that the 2019 sampling plan will be conducted consistent with the 2017 sampling parameters, or as otherwise required by DTSC's 5-Year Review recommendations to be developed in 2019.</p>
5	Figure 17, Shallow Groundwater Elevation Contours, April 3, 2017	5	<p>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.</p>	<p>Figure 17 has been amended to include the groundwater elevations from the IMW-wells.</p>

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6	Appendix D, Water Level Measurement Sampling Forms	6	<p>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.</p> <p>Part II, Section 10. Surface Construction Features. States:</p> <p>A. <u>Locking Cover</u>. "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".</p> <p>B. <u>Casing Cap</u>. "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".</p> <p>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.</p>	<p>All future technical memoranda will include a subsection describing well inspection activities, the condition of wells that required repair or maintenance, and the repair or maintenance activities that were completed.</p>