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May 17, 2022 *via electronic delivery*

Mr. Kenneth Skinner
Tektronix Incorporated
14200 SW Karl Braun Drive
P. O. Box 500, M/S 55-115
Beaverton OR 97077-0001

RE: 2021 Annual Report and related documentation
Tektronix Beaverton Campus – Evaluation Area 1
ECSI No. 167

Dear Ken Skinner:

DEQ staff reviewed the *2021 Annual Report, Tektronix, Inc. – Evaluation Area 1*, *Beaverton, Oregon* prepared by Landau Associates for the Tektronix Beaverton Campus ("site") and dated May 6, 2022. DEQ also reviewed the following supporting documents prepared by Landau for the site:

Quarterly Progress Report No. 80, First Quarter 2022 (April 6, 2022)
Quarterly Progress Report No. 79, Fourth Quarter 2021 (January 17, 2022)
Quarterly Progress Report No. 78, Third Quarter 2021 (October 13, 2021)
Quarterly Progress Report No. 77, Second Quarter 2021 (August 9, 2021)
Quarterly Progress Report No. 76, First Quarter 2021 (April 15, 2021)
Bioremediation Performance Evaluation through July 2021, Former Building 40 South Area (October 28, 2021)

The site has been organized into Evaluation Areas 1 through 6 to facilitate remedial investigation and cleanup activities in accordance with the 2002 Order on Consent (No. ECSR-NWR-01-13) between DEQ and Tektronix. DEQ selected a remedial action for Evaluation Area 1 in 2009. The Record of Decision identifies source areas requiring remediation to address elevated volatile organic compounds (VOCs) in groundwater, specifically trichloroethene (TCE) concentrations.

The first phase of treatment comprised of *in situ* thermal remediation methods began in 2011 and completed in 2012. Subsequently, DEQ approved supplemental groundwater investigations for remaining source areas to support remedial design, and in 2015 DEQ provided conditional approval to implement *in situ* bioremediation methods as a reasonable treatment alternative. In general, TCE concentration trends in groundwater are generally stable to decreasing, with some transient increases in daughter products associated with ongoing, sequential reductive dichlorination.

The annual report presents groundwater and surface water quality data results and is accompanied by an examination of contaminant concentrations versus cleanup levels as part of the overall assessment of monitored natural attenuation (MNA) and enhanced in situ bioremediation (EISB) at the subject property. Data presented in quarterly progress reports No. 76 through 80 (first quarter 2021 through first quarter 2022) and the July 2021 bioremediation performance evaluation for the Former Building 40 area, are summarized in the 2021 Annual Report. DEQ has the following general comments on submitted documents.

DEQ COMMENTS

Data presentation. We are generally comfortable with the presentation of analytical data in the above-cited reports, and interpretations regarding contaminant trends, meaningfulness of source vs. daughter product ratios, and significance of results relative to the Risk Based Concentration (RBC) for Groundwater in Excavation pathway being applied for risk screening.

Updated RBCs for Ecological Risk. The memorandum *Bioremediation Performance Evaluation through July 2021* presented updated (default) screening values, including ecological RBCs for wildlife ingestion of surface water. For risk-based screening of water concentrations, Tektronix should apply the chronic value in Table 2 (Risk Based Concentrations for Water) for protection of aquatic life from DEQ's *2020 Conducting Ecological Risk Assessments*, which is 220 ppb for TCE. Alternatively, the range between chronic and acute can be used for comparison purposes, which is 220-2000 ppb TCE in surface water.

In the 2021 Annual Report, Table 5 reporting surface water sampling results and screened data against the updated value of 440,000 ppb TCE (previously 3,000 ppb), which corresponds to the mammalian direct ingestion to surface water RBC in Table 1b of the 2020 guidance. The lower applicable direct toxicity water RBCs are presented in guidance Table 2, and as noted above, 220 ppb is the appropriate screening value. Table 5 of the report appropriately retains the human health screening value, which is 1.4 ppb for TCE. Note, citations and table notes need correcting in the report.

DEQ acknowledges the most conservative screening value of 1.4 ppb has not been exceeded for some time. With that said, DEQ may re-examine whether it is reasonable to resume (temporarily) surface water sampling as a precautionary measure, including drainage locations, pending activities planned for the site.

Groundwater Assessment. Groundwater sampling results for HVOCs remained above RBCs for one or more contaminants at three locations (MW-E11-50, MW-E12-45, and MW-E12-55), most notably at the MW-E12-45 location. Contaminant trends, however, are favorable at all three locations. Continued semi-annual monitoring at the three locations with RBC exceedances is recommended, particular for MW-E12-45 given the high concentrations of HVOCs that remain.

At the two locations where HVOCs remain elevated above RBCs, it is important to note that organic carbon concentrations have been decreasing over time and were well below 10 mg/L during recent sampling events. These concentrations indicate insufficient "donor material" to support robust reductive dechlorination. With this observation, we were pleased to see the proposal for a fourth injection in the 2021 Annual Report. We approve of the proposal and look forward to submission of a draft work plan.

Revisions to Vapor Intrusion RBCs. DEQ is currently working to update *Guidance for Assessing and Remediating Vapor Intrusion in Buildings* to reflect current standards and practices. As part of this effort, DEQ RBCs for the vapor intrusion into buildings pathway are being reexamined and are expected to be revised to correspond to the current toxicological information and accepted models for assessing contaminant vapor migration. DEQ anticipates that groundwater RBCs for the vapor intrusion into buildings pathway (RBCwi) will decrease by an order of magnitude. It will be necessary to discuss the significance of this change vis-à-vis site risk screening and decision-making.

Next Steps Towards Site Closure. More recently, Tektronix shared an interest to expedite cleanup activities towards site closure, which provides additional context to consider. DEQ advised completing updated human health risk assessments for EA1 through 6 to include potential expanded uses at the site. Underway, is preparation of risk assessment data re-evaluation and HHRA update approach. DEQ acknowledges revised RBCs for the vapor intrusion pathway will be critical to this forthcoming assessment. We hope to have draft values to share by the end of June. There are also options available to accelerate achieving remedial action objectives in EA1, such as additional bioremediation injections. DEQ will continue to work

with Tektronix to advance the site towards site closure while ensuring appropriate measures are taken to protect human health and the environment.

After you have had an opportunity to review these comments, we recommend a short meeting to answer any questions you may have and discuss next steps.

Please contact anytime about the project at erin.k.mcdonnell@deq.oregon.gov or (503)229-6900.

Sincerely,

Erin K. McDonnell, P.E.
Project Manager/Engineer
Northwest Region Cleanup Program

Cc: Daniel Hafley, DEQ
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