NEVADA DIVISION OF
ENVIRONMENTAL PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Brian Sandoval, Governor
Bradley Crowell, Director
Greg Lovato, Administrator

October 23, 2018

Jay A. Steinberg
Nevada Environmental Response Trust
35 East Wacker Drive, Suite 1550
Chicago, IL 60601

Re: Tronox LLC (TRX) Facility
Nevada Environmental Response Trust (Trust) Property
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection (NDEP) Response to: *Baseline Health Risk Assessment Work Plan for OU-1 and OU-2 Soil Gas and Groundwater*
Dated:

Dear Mr. Steinberg,

The NDEP has received and reviewed the Trust's above-identified Deliverable and provides comments in Attachment A. A revised Deliverable should be submitted by 01/23/2019 based on the comments found in Attachment A. The Trust should additionally provide an annotated response-to-comments letter as part of the revised Deliverable.

Please contact the undersigned with any questions at wdong@ndep.nv.gov or 702-486-2850 x252.

Sincerely,

Dong Weiquan

Weiquan Dong, P.E.
Bureau of Industrial Site Cleanup
NDEP-Las Vegas City Office

WD:cp

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Attachment A

Specific Comment #1 Section 5.2.2 Fate and Transport Modeling, pages 23 to 25.

"For on-Site populations in the Operations Area of OU-1, Ramboll will develop transfer factors for the following scenarios:

a. Transport of soil gas from five ft bgs into a commercial/industrial slab-on-grade building;
b. Transport of soil gas from five ft bgs to outdoor air;

The intermedia transfer factors will be estimated using the screening-level model described by Johnson and Ettinger (1991); this model was developed to predict vapor migration into buildings using a combination of diffusion and advection. Specifically, Version 3.1 of the spreadsheet implementation developed by the USEPA will be used (USEPA 2004).

The calculation of transfer factors will be based on parameters describing the properties of the chemicals evaluated, the vadose zone, the surface barrier, and the air dispersion zone."

In addition:

"Benzene is well known to degrade naturally due to aerobic respiration at many sites. Measured concentrations of benzene at shallow depths are consistently lower than would be predicted from deeper sources (soil gas and groundwater) using typical diffusion modeling with no biodegradation, providing evidence for biodegradation at the NERT Site. To account for this, the software bioVapor (American Petroleum Institute [API] 2012) will be used to calculate the relative impact of biodegradation between the samples collected at depth and at the surface for all soil gas and groundwater scenarios."

For the NERT site the unknown in the foregoing discussion is the exact location for each 5-foot soil gas sample relative to infrastructure in the immediate area of the sample. Figure 3-1 (Proposed Soil Gas Sample Locations in the NERT Off-Site Study Area of OU-2) when compared to Figure 4-4 (Existing Shallow Groundwater Sample Locations in the NERT Off-Site Study Area of OU-2) appears to indicate that some soil gas samples may be collected below or immediately adjacent to infrastructure such as a street, for example. The foregoing argument applies as well to Figure 3-2 (Proposed Soil Gas Sample Locations in the Operations Area of OU-1). The NDEP requests that NERT provide documentation for each 5-foot sample location relative to shallow soil cover such that the shallow soil gas data can be appropriately evaluated.

EPA and Published References Regarding Soil Vapor (Specific Comment #1) EPA (2015), Section 2.2 Subsurface Vapor Migration, pages 24-25. EPA states that "Advection of soil gas may also occur near the ground surface due to fluctuations in barometric (atmospheric) pressure, which can either release soil gas into the atmosphere (Clements and Wilkening 1974) or introduce ambient air into the subsurface environment (the latter process may be important in oxygenating surface soil horizons)."

EPA (2015), 6.4.4 Soil Gas Sampling, pages 103-104. EPA states that "Modeling results for idealized scenarios show that, in homogeneous soil, soil gas concentrations tend to be greater beneath the building than at the same depth in adjacent open areas when the vapor source is underneath the building, even if the source is laterally extensive relative to the building footprint (e.g., broad plume of contaminated groundwater) (EPA 2012b). Given these predictions and supporting field evidence (EPA 2012a, see Figure 6; Luo et al. 2009; Patterson and Davis 2009, see Figure 1), individual exterior soil gas samples cannot generally be expected to accurately estimate sub-slab or indoor air concentrations. This potential limitation may be particularly valid for shallow soil gas samples collected exterior or adjacent to a building footprint...Deeper soil gas samples collected in the vadose zone immediately above the source of vapor contamination (i.e., 'near-source' soil gas samples; see Section 6.3.1) can reasonably be expected to be less susceptible to the diluting effects of ambient air, compared to shallow soil gas samples. On this basis, deeper soil gas samples collected in the vadose zone immediately above the source of vapor contamination will tend to be more suitable than will be shallow soil gas samples for assessing vapor concentrations that may be in contact with the building's sub-slab."

EPA (2015), page 109 "The groundwater attenuation factor is intended to account for concentration dilution arising during vapor migration from the groundwater table through the vadose zone, in addition to concentration dilution arising during migration through openings in the foundation and from mixing of subsurface contaminants inside the building."

Specific Comment #2 Section 3.2.2 Phase 2 RI, page 12, 2nd paragraph.

Please explain how "stabilized" groundwater were determined.

Specific Comment #3 Section 3.2.4 Unit 4/5 Buildings Investigation, page 13, 2nd paragraph.

Please provide the analytical results for the referenced temporary wells.

Specific Comment #4 Section 3.2.4 Unit 4/5 Buildings Investigation, page 13, 3rd paragraph.

Please clarify with regards to the 60-ft bgs well construction, e.g., is 60 feet the total depth, or is it the depth to the top of the screen zone, etc. Please provide the construction details and sampling data for these wells.

Specific Comment #5 Table 5-4 Modeling Parameters for the Operations Area of OU-1.

Depth to top of soil contamination is stated as a conservative estimate. Are there site-specific data to support the estimate?

References

EPA, 2004. User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings. February.

EPA, 2015. OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. EPA9200.2-154. June.