



NEVADA DIVISION OF  
**ENVIRONMENTAL  
PROTECTION**

**STATE OF NEVADA**  
Department of Conservation & Natural Resources

Brian Sandoval, Governor  
Leo M. Drozdoff, P.E., Director  
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July 13, 2016

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: *Technical  
Memorandum Remedial Investigation Data Evaluation*

Dated: May 2, 2016

Dear Mr. Steinberg,

The NDEP has received and reviewed the Trust's above-identified Deliverable and finds that the document is acceptable with the following comments noted for the Administrative Record and NDEP requires a formal response to these comments within thirty days from the letter received:

1. NERT's Remedial Investigation should be expanded to include areas to the southeast of the Site, known as the "BMI Common Areas." Henderson Legacy Conditions (HLC) are present in the BMI Common Areas due to migration of hazardous substances released at the Henderson Property prior to the Effective Date of the Trust.
2. NERT should update the CSM to include areas to the southeast of the Site, known as the "BMI Common Areas." Inclusive with the current Study Areas, this will present a full conceptual understanding of all sources, contaminant migration pathways, and remaining contamination. NDEP suggests including the following items in the updated CSM:
  - a. Incorporate all available data from other BMI companies including BRC, TIMET, AMPAC (Endeavor LLC) and OSSM so that an appropriate HLC CSM can be developed to meet the end of the RI process;
  - b. Prepare at least three representative hydrogeological cross-sections at appropriate latitude and longitude direction crossing the entire HLC area respectively. The locations of the longitude cross-sections should include at least one through NERT core perchlorate plume, and two along west to east orientations. The locations of the latitude cross-sections should be at least one through the source region of the NERT core perchlorate plume, one approximately following Galleria Rd, one approximately following southern bank of the Las Vegas Wash. All cross-sections should be constructed based on all boring logs and follow the NDEP guidance on Hydrogeologic and lithologic Nomenclature Unification (January 6, 2009). Please justify if NERT has different hydrogeologic interpretation on the areas crossing property or study boundaries from neighbor companies;

- c. Prepare three-dimension geological block model showing alluvial deposits, transitional Upper Muddy Creek Formation, Upper Muddy Creek Formation or bedrocks;
  - d. Prepare a unified paleochannel map that incorporates all interpretations from the other companies within BMI region;
  - e. Prepare annual groundwater table elevation contour map that show groundwater flow direction arrows starting from major perchlorate sources starting from 2000;
  - f. Prepare a map that shows/label historic sources and areas where soil has been removed. For reference, these features should be kept on other maps;
  - g. Calculate groundwater velocity and traveling time starting from major perchlorate sources;
  - h. Prepare and update map with historic (prior to excavation) and current soil concentration ranges at source areas;
  - i. Prepare and update figure showing groundwater concentration contours for perchlorate over the entire HLC area to at least 20 ppb for pre-pump-treat and the year of 2002, 2006, 2012 and 2015. Include overlay for existing paleo-channel locations;
  - j. Prepare three-dimension distribution of the contaminants (e.g., perchlorate, hexavalent chromium) in soils and groundwater sourced from the NERT site;
  - k. Calculate contaminant mass in soil and groundwater showing detail parameters of contaminated groundwater saturated thickness, porosity, contaminated groundwater volume, contaminant concentration in groundwater for pre- pump-treat and for the years of 2002, 2006, 2012, 2015, add contaminated soil volume, contaminant concentration in contaminated soils pre- and post- soil excavation.
3. Section 4.1 Summary of Soil Data Gap Investigation Results, Area 4 Area West of Mn-1 Pond, page 23. It was noted in Area 4 that high concentrations of perchlorate, chromium and chloroform were found in the groundwater in the area west of the Mn-1 pond. This section mentions that the Mn-1 pond will be decommissioned and that potential impacts to soils beneath the pond will be conducted. However, a time frame for the decommissioning and subsequent investigation is not given. NDEP desires a time frame and type of analysis for this pond decommissioning in the revised Deliverable.
4. Specific Comment #2 Section 4.2 Identification of Soil COPCs, pages 25-26. This section identifies soil COPCs, and, there are several comments related to this section.
- a. If a purpose of this Deliverable is to identify COPCs that may be impacting groundwater using the LBCLs for screening, the comparison to only the first 10 feet below ground surface (bgs) seems to limit the scope of the COPC identification process. In addition, as some samples were collected from excavated areas, decommissioned ponds, and basements, the limit of ten feet seems to be too arbitrary. NDEP finds that the revised Deliverable should include LBCLs for all chemicals down to groundwater.
  - b. First paragraph states that comparison to human health based BCLs was not conducted, but this is contradictory to remaining sections of this document that make comparisons to industrial worker soil BCLs (for example, please see page 26). The rationale states that comparison to human health based BCLs were not done because the baseline human health risk assessment is in progress. NDEP finds that

comparison to human health based soil BCLs should be conducted (similar to the work performed previously for the site).

- c. This section does not address the vapor inhalation pathway, NDEP finds that the revised should address the vapor inhalation pathway.
  - d. Comparisons to maximum detected “background” concentrations is not an appropriate way to eliminate COPCs. Especially, elimination of soil chemicals based on comparison to the maximum detected concentration is not advised. This comment also applies to Section 4.2.2 Metals in Soil (page 27). If metals are to be eliminated through a comparison to background, then an appropriate analysis should be conducted consistent with NDEP guidance.
5. Specific Comment #3 Section 4.2.2 Metals in Soil, Second paragraph, footnote 6, page 27. Footnote cites two background data sets. The background data set used should apply to the NERT site (RZ-A background data set) and not the BMI Complex and Common Areas Vicinity.
  6. Specific Comment #4 Section 4.2.4 Radionuclides in Soil, page 28. It does not appear that secular equilibrium was evaluated for the radionuclides detected in soil. In addition, the comparisons to LBCLs were limited to the top 10 feet of soil. Radionuclides should be addressed via an NDEP approved background comparison method and an analysis of secular equilibrium.
  7. Specific Comment #5. Section 5.2 On-Site Groundwater, page 32. Chloroform was identified as a COPC in soil. The statement that chloroform is only a “trespassing” VOC has not been adequately justified. It is recommended that the “trespassing” term either be removed or qualified such as “contribution of chloroform may be as a trespassing COPC”.
  8. Specific Comment #6. Section 5.2 On-Site Groundwater, Chromium, page 33. Hexavalent chromium has been detected in soil and groundwater at the site. The current section only appears to discuss chromium; presumably as total chromium. Please summarize the available data for hexavalent chromium in this section of the report.
  9. Specific Comment #7. Section 5.2.3 Further Investigation of Trespassing Chemicals from Neighboring Properties, page 34. As noted above, chloroform was identified as a COPC in soil and should not be solely considered a “trespassing” VOC (see Specific Comment #7 above).
  10. Specific Comment #8. Section 5.3.3 Further Investigation of Chloroform in the Downgradient Plume, pages 39-40. Please include a discussion of the corresponding preliminary risk if the 10-15 foot bgs soil gas data were used versus the 5-foot depth interval?
  11. Specific Comment #9. Section 6.2 Identification of Additional Data Gaps, pages 42-43. NERT may consider that chromium and hexavalent chromium along with perchlorate because they generally share same source.
  12. Specific Comment #10. Section 7 Phase 2 RI Data Gap Investigation, page 44. Is it possible for additional work to be conducted in the Mn-1 pond? Also, it is noted that chromium will be analyzed for in soil, but what about hexavalent chromium in groundwater and soil? Are there plans to collect additional soil gas for the vapor inhalation pathway especially around the unit buildings?
  13. Specific Comment #11 Figure 3-1a and 3-1b. There are many wells located between TR-1/TR-2, the MW5A cluster to SA21 cross sectional segment and SA21 to SA25 cross sectional segment (see figure below from Regional GW Database). If boring logs from wells in close proximity to the investigator’s cross-sectional line have not been taken into

consideration, should the investigators acknowledge their existence and provide justification / rationale for taking into account? This is important since other companies' have depicted cross-sections along similar alignment which use different wells and with different interpretation of subsurface conditions – specifically speaking Figures 2-1 and 2-2 of OSSM's GW RAS (Geosyntec 2014 ); note Figure 2-1 provided below as a reference attachment.

14. Specific Comment #12 Figure 3-1a between TR-1/TR-2. The MW5A cluster to SA21 along the cross section alignment appears to be located within the area commonly referred to as the “Muddy Creek High”. Based upon the subsurface depiction on Figure 3-1a this does not appear to be depicted by NERT investigators. Suggest that this be addressed in a revised document or future comprehensive version of RI Report.
15. Specific Comment #13 Section 4.1 Summary of Soil Data Gap Investigation Results, Area 3 Debris Pile, page 22. Previous area discussions included a description of the types of analyses that were conducted for the samples collected. It would be helpful to include this in each area discussion to assist the reader in understanding what chemical and/or physical analyses were conducted for the media sampled.
16. Specific Comment #14 Section 4.1 Summary of Soil Data Gap Investigation Results, Area 8 Investigation Near Unit Buildings and Leach Plant, Monitoring Well Pilot Borings Near Unit Buildings, page 24. Similar to the previous comment, it would be helpful to include the chemical and/or physical analyses that were conducted for the media sampled.
17. Specific Comment #15 Section 2.1.6 Historical Wastewater and Storm Water Disposal Practices, p. 9, first two paragraphs. Based upon review of Figure 2-3 and the referenced text does not address the green colored-coded historical ditch segment annotated with a question mark.
18. Specific Comment #16 Section 2.3.2, p. 13, first full paragraph, last sentence. It is recommended that the Deliverable be revised to include additional details regarding this statement for clarity. As stated, no conclusion can be drawn regarding whether the data gap has been resolved and within the context of a RI report this is important. A footnote reference additional documentation maybe all that is necessary.
19. Specific Comment #17 Section 3.2.2 Local Geology, Transitional (or reworked Muddy Creek Formation) subsection, p. 16. Although the investigator's preface the paragraph with the conditional statement “where present”, it should be noted that it appears as though none of the cross-sections depict the presence of the transitional MCF, however, investigator's on both sides of the NERT plant site have acknowledged and logged the xMCF. Suggest the investigators clarify their interpretation of subsurface conditions.
20. Specific Comment #18. Section 3.2.3, p. 20, Middle WBZ (UMCf-fg1) subsection, p. 20. The following subsection “UMCf-cf2” is detailed yet the report is silent as regards treatment of this unit within the context of the numerical model and remedial alternative process. Suggest additional rationale be presented as to reasons for inclusion of one unit and not the other.
21. Specific Comment #19 Section 3.3 Surface Water, p. 20, third paragraph, third sentence states, “The former Beta Ditch Extension and associated volatile organic compound (VOC) and chloroform-impacted soils were excavated in 2010.” VOCs were not the only compounds exceeding screening threshold (i.e. drivers for removal of the Beta Ditch). The Deliverable should be revised for consistency with the record.

22. Section 2.1.6 Historical Wastewater and Storm Disposal Practices, p.9, third paragraph states, "Montrose Chemical Corporation (Montrose), a manufacturer of chlorinated benzenes, hydrochloric acid, chloroethane, pesticides, and polychlorinated biphenyls (PCBs), discharged wastewater to the Beta Ditch that contained sulfuric acid (possibly with trace DDT), hydrochloric acid containing various PCBs....." The Deliverable should include reference(s) to the technical reports or data which substantiate this statement.
23. Section 6.1 Key Findings of the RI Data Gap Investigation, page 42 and Off-Site NERT RI Study Area, page 43. NERT may consider that the chlorinated benzene isomers can be useful tracer chemicals.
24. NDEP suggests adding a table showing annual production of perchlorate related compound, annual perchlorate produced and annual perchlorate wasted for the period starting and ending production for Kerr-McGee/Tronox.
25. Appendix D Subsurface Cross Sections, Plates D-1b, -2b, -3b, -4b, -5b, -6b, -7b, -8b, -9b, -10b, 11b were reviewed for definition of the perchlorate plume and located on Figures 7-3a and 7-3b for comparison to planned additional wells. For future reference it would facilitate review to post the cross section lines on a map such as Figure 7-3b.
  - a. Cross Section D - bounding perchlorate plume would be improved by adding a deep well in the vicinity of well M-14A.
  - b. Cross Section F - bounding perchlorate plume would be improved by adding several deep shallow zone wells one each to the east and west of well cluster M-100, -151, and -155.
  - c. Cross Section H - has one deeper well planned and a second deeper well east of PC-179 is recommended.
  - d. Cross Section I - bounding perchlorate plume would be improved by adding two deeper wells into the Muddy Creek formation.
  - e. Cross Section J - bounding perchlorate plume would be improved by adding two deeper wells one to east side and the other west of planned deeper well PC-176 (proximal to PC-130).
  - f. Cross Section K - bounding perchlorate plume would be improved by adding two deeper wells near MW-K4 and ARP-2A.
  - g. Cross Section L - this longitudinal section highlights the need for more vertical plume definition as discussed above.

Please contact the undersigned with any questions at [wdong@ndep.nv.gov](mailto:wdong@ndep.nv.gov) or 702-486-2850 x252.

Sincerely,



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