



March 23, 2023

Jay A. Steinberg  
Nevada Environmental Response Trust  
35 East Wacker Drive, Suite 690  
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 *ARCADIS Proposal  
for Feasibility Study Report for OU-1 and OU-2*

Dated: November 16, 2022

Dear Mr. Steinberg,

The NDEP has received and reviewed the Trust's above-identified Deliverable and provides comments below. A revised Deliverable should be submitted by **06/30/2023** based on the comments. The Trust should additionally provide an annotated response-to-comments letter as part of the revised Deliverable.

1. The proposal has major components described by the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA. Office of Emergency Remedial Response, Washington DC 20460. Directive 9355.3-01 (USEPA, 1988). The NERT's RI/FS Workplan approved by NDEP in 2014 described three tasks about the feasibility study and they are: 1) Remedial Alternatives Development; 2) Detailed Analysis of Alternatives; 3) Feasibility Study Report. The author of the RI/FS Workplan approved was ENVIRON (Ramboll). Although the ARCADIS proposal is similar to what the RI/FS Workplan described in the feasibility study, many things have changed since the RI/FS Workplan was approved. Therefore, NDEP suggests that NERT revise the ARCADIS proposal for Feasibility Study Report for OU-1 and OU-2 that was submitted as an attachment for the NERT 2023 Budget request.
2. "At the direction of NERT, this proposed FS evaluation strictly follows the United States Environmental Protection Agency (USEPA) Guidance for Conducting Remedial Investigations and Feasibility Studies Under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; USEPA 1988)." Some updates on the feasibility study were published in the USEPA reports and some feasibility study workplans for other sites (Cascadia Associates, LLC, 2019, Anchor QEA, LLC., 2018, USEPA, 2005 and USEPA, 2017). NDEP suggests that NERT refer to those updates and adopt recommendations that are applicable to the NERT site.

3. Although this feasibility study is just for OU-1 and OU-2, the feasibility study should consider that OU-1, OU-2, and OU-3 are hydraulically connected and the development of Remedial alternatives for OU-1 has prior effects on the development of Remedial alternatives for OU-2. Similarly, the development of Remedial alternatives for OU-2 has prior effects on the development of Remedial alternatives for OU-3. NDEP suggests that the hydraulic connection between OU-1, OU-2 and OU-3 be considered during the development of Remedial alternatives.
4. The GWETS has been removing perchlorate and hexavalent chromium from the subsurface, so the feasibility study should clearly define the No Further Action baseline for the development of Remedial alternatives.
5. Because OU-1 and OU-2 have different COPCS, especially different mass and distribution of these COPCS and different RAOs, it is likely that different technologies or combinations of technologies will be selected for OU-1 and OU-3. It is not clear how alternatives that combine approaches or technologies will be handled in the feasibility study. NDEP requests clarification.
6. “The assembled remedial alternatives will then proceed through a screening process specifically for the remedial alternatives. The screening of the remedial alternatives against the decision criteria of effectiveness, implementability, and relative cost will be presented in Section six of the FS Report”. These three factors are not independent of each other, and this process often is best done in an iterative fashion, especially at complex sites. The NERT has performed the green remediation and BMP analysis for the project as instructed by USEPA and NDEP, but this is not mentioned in the proposal. NDEP suggested that the FS workplan consider the green remediation and BMP analysis for the FS study. NDEP also suggests that NERT quantify weights of each factor for the screening and the development of remedial alternatives with justifications. All the processes performed should be documented in the FS report in considerable detail.
7. NDEP suggest that the labels for alternatives in Figure 2 (Conceptual remedial alternatives pertaining to the relevant impacted media, COPCs, and RAOs) be labeled as OU-1 Soil Source Control Alt-1, OU-1 Source Control Soil Alt-2, OU-1 Source Control Soil Alt-3, OU-1 Source Control Soil Alt-4, OU-1 Source Control Groundwater Alt-1, OU-1 Source Control Groundwater Alt-2, OU-1 Source Control Groundwater Alt-3, OU-1 Source Control Groundwater Alt-4, OU-1 Plume Containment Groundwater Alt-1, OU-1 Plume Containment Groundwater Alt-2, OU-1 Plume Containment Groundwater Alt-3, OU-1 Plume Containment Groundwater Alt-4, OU-2 COPC Reduction Groundwater Alt-1, OU-2 COPC Reduction Groundwater Alt-2, OU-2 COPC Reduction Groundwater Alt-3, OU-2 COPC Reduction Groundwater Alt-4.
8. Section 3.1 states that “the USEPA’s 1988 guidance document suggests the range of accuracy for cost estimates associated with FS evaluations be approximately -30 percent to +50 percent for the detailed analysis of alternatives.” NDEP’s understanding is that this range of accuracy is general for all situations. Although the NERT site is complex, the remediation investigations, treatability studies, and interim remedies have been unprecedentedly done at the NERT site. Therefore, NDEP suggests that data from the RI, treatability studies, and interim remedies be used to inform the cost estimate and refine the uncertainty range for each

alternative, with the understanding that each alternative will include approximately the same level of detail to allow preparation of comparable cost estimates.

9. Section 3.6 FS Report Cost and Associated Assumptions. “Developing accurate cost estimates generally is an essential part of evaluating alternatives. It is also appropriate at many sites, and can be especially useful at large sites, to include the relative cost of achieving different cleanup levels” (USEPA, 2017, 2000). USEPA (2017) also states that “The basis for a cost estimate may include a variety of sources, including cost curves, generic unit costs, vendor information, standard cost estimating guides, and similar estimates, as modified for the specific site. Where site-specific costs are available from pilot studies or removal actions, they are likely to be the best source of realistic cost information. Where this is not available, actual costs from similar projects implemented at other sites is frequently the next best source of costs”. The proposal states “Assumed duration of remedial activities and bases for assumption”. Because the duration is a direct multiple factor for the cost, NDEP suggests that NERT identify the time frame(s) in which the alternatives are expected to achieve cleanup levels and RAOs with uncertainty by considering following factors:
  - a. Technology selected.
  - b. Mass and its distribution of COPCS in soil, groundwater, and hydrogeologic units.
  - c. GWETS time series mass removal rate.
  - d. Groundwater age dating data and tracer study results (DRI, 2023).
  - e. Groundwater flow and transport model.
  - f. AWF Capture Zone and Matrix Diffusion Evaluation (Ramboll, 2021).
  - g. Other case studies.

References:

1. USEPA (U.S. Environmental Protection Agency), 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. Interim Final. EPA/540/G-89/004. OSWER Directive 9355.3-01. Office of Emergency and Remedial Response, Washington, DC.
2. USEPA. 2000. A Guide to Developing and Documenting Cost Estimates During the Feasibility Study. EPA 540/R-00/002. Office of Emergency and Remedial Response. Washington, D.C.
3. USEPA, 2005. Contaminated Sediment Remediation Guidance for Hazardous Waste Sites. OSWER Publication 9355.0-85. Draft. Office of Solid Waste and Emergency Response, Washington, DC. Available from: <https://clu-in.org/download/contaminantfocus/sediments/contaminated-sediment-remediation-EPA-guidance.pdf>.
4. USEPA, 2017. Remediating Contaminated Sediment Sites – Clarification of Several Key Remedial Investigation/Feasibility Study and Risk Management Recommendations, and Updated Contaminated Sediment Technical Advisory Group Operating Procedures. Available from: [http://www.rpelawalert.com/wp-content/uploads/sites/240/2017/01/USEPA\\_Sediments-Directive-Memo\\_M-Stanislaus-1-9-17-1.pdf](http://www.rpelawalert.com/wp-content/uploads/sites/240/2017/01/USEPA_Sediments-Directive-Memo_M-Stanislaus-1-9-17-1.pdf). January 9, 2017.
5. Anchor QEA, LLC, 2018. Final Feasibility Study Work Plan Remedial Investigation/Feasibility Study, Newtown Creek Prepared by Anchor QEA, LLC 123 Tice Boulevard, Suite 205 Woodcliff Lake, New Jersey 07677, January 2018.

6. Cascadia Associates, LLC, 2019. Feasibility Study Work Plan, Former Pope & Talbot Wood-Treating Site ECSI ID #959, St. Helens, Oregon. July 16, 2019, Project No. 0034-001-006.
7. Ramboll, 2021. AWF Capture Zone and Matrix Diffusion Evaluation, Appendix B for the RI Report for OU-1 and OU-2.

Please contact the undersigned with any questions at [wdong@ndep.nv.gov](mailto:wdong@ndep.nv.gov) or 702-668-3929.

Sincerely,

*Dong Weiquan*

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