



NEVADA DIVISION OF
**ENVIRONMENTAL
PROTECTION**

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

August 29, 2017

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: *RI/FS Work Plan
Addendum: Phase 3 Remedial Investigation, Nevada Environmental Response Trust Site,
Henderson, Nevada*

Dated: May 5, 2017

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 10/29/2017** 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,

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

WD:cp

EC:

James Dotchin, NDEP BISC Las Vegas
Carlton Parker, NDEP BISC Las Vegas
Allan Delorme, Ramboll Environ
Alison Fong, U.S. Environmental Protection Agency, Region 9
Andrew Barnes, Geosyntec
Andrew Steinberg, Nevada Environmental Response Trust
Anna Springsteen, Neptune & Company Inc.
Betty Kuo Brinton, MWDH2O

Brenda Pohlmann, City of Henderson
Brian Waggle, Hargis + Associates
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Chuck Elmendorf, Stauffer Management Company, LLC
Dave Share, Olin
David Johnson, Central Arizona Water Conservation District
Dave Johnson, LVVWD
Derek Amidon, Tetrattech
Ebrahim Juma, Clean Water Team
Ed Modiano, de maximis, Inc.
Eric Fordham, Geopentech
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Kevin Fisher, LV Valley Water District
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Ranajit Sahu, BRC
Rick Perdomo, AG Office
Richard Pfarrer, TIMET
Rick Kellogg, BRC
Scott Bryan, Central Arizona Project
Steve Clough, Nevada Environmental Response Trust
Steven Anderson, LVVWD
Tanya O'Neill, Foley & Lardner L
Todd Tietjen, SNWA

Attachment A
Essential Corrections

1. General Comment

Throughout the RI/FS Work Plan Addendum: Phase 3 Remedial Investigation there does not appear to be a consistent or coherent definition of the term COPC. NDEP suggests that NERT refer Administrative Order on Consent about BMI Common Area Phase 3 (2006) clearly to explain why the hexavalent chromium and VOCs are not chosen as COPCs.

2. Planned Phase 3 RI Activities, pages ES-3 and ES-4:

- a. 1st bullet, page ES-3 - the text lists as rationale for baseline sampling as due to large variances in perchlorate and chlorate concentrations, but does not provide supporting data. NDEP requests inclusion of a supporting data summary.
- b. 2nd bullet, page ES-3 - NDEP requests the inclusion of depth range for “deep soil borings.”
- c. 6th bullet, page ES-4 - NDEP requests clarification of the term “focused” hydraulic testing.

3. Section 2.2 Site Description, 2nd paragraph, p. 4. It should be noted that two schools, and thus, possible sensitive receptors, also exist within the southern portion of the Eastside Area; Lake Mead Christian Academy expansion and Pine Crest Charter.

4. Section 2.7.2-Local Geology: The United States Geological Survey (USGS) Preliminary geologic map of the Lake Mead 30' X 60' quadrangle, Clark County, Nevada, and Mohave County, Arizona (2007) documents the Horse Spring Formation (including the Bitter Ridge Limestone and Lovell Wash Members, and the Thumb Member) as outcropping at the ground surface near the very northernmost part of the Northeast Area. Similarly, the Nevada Bureau of Mines and Geology, Geologic Map of the Henderson Quadrangle, Nevada, Map 67, 1980 documents the Horse Springs Formation and the Thumb Formation in this area. The 1980 geologic map is shown on Figure 4-3b as a basemap. Section 2.7.2 should be revised to reflect the geologic mapping done in this part of the Northeast Area.

5. Section 4.1 Initial Evaluation of Current Conditions, Summary of Key Findings, page 17, 2nd bullet on page. There are two zones below the Shallow WBZ, please clarify if this applies to both the Deep and Middle WBZ or is limited to the Middle WBZ.

6. Section 5.0 Remedial Action Objectives and ARARS, 1st bullet, p. 22.

The Deliverable states that “Other Site COPCs: The most prevalent COPC detected in groundwater at the Site other than perchlorate is chromium. The chemical-specific ARAR for chromium is the federal maximum contaminant level (MCL) of 100 µg/L, which the State of Nevada has adopted by reference (NAC 445A). For other Site COPCs, the chemical-specific ARARs/TBCs discussed above will be evaluated based on the results of a site-specific risk assessment and incorporated into the Site FS.” This statement implies that COCPs other than

Henderson Legacy Conditions COPCs will be evaluated. Please make clearer that the Phase 3 RI will only evaluate the COPCs of perchlorate and chlorate.

7. Section 6.1 – Identification of Data Gaps:
The NDEP would like to highlight the importance of investigating the transport pathways and sources within the Eastside Study Area contributing to the perchlorate mass loading to the Las Vegas Wash as far as the downstream extent of the impacts recently identified in the Downgradient Study. Collaboration and connection between these two Ramboll Environ and AECOM led studies is essential to building the comprehensive CSM that will be reported in the RI Reports.
8. Section 6.1 – Identification of Data Gaps, Summary of Data Gaps: The USGS and Nevada Bureau of Mines and Geology have documented the presence of geologic units other than the alluvium and Upper Muddy Creek Formation near the northern extent of the Northeast Area. This should be evaluated during implementation of the investigation per Section 6.1, which indicates that delineation of features important to understanding the groundwater flow system will be addressed as a data gap.
9. Section 6.1 Identification of Data Gaps, Summary of Data Gaps, bullets, pp. 25-26. Three of the four bulleted data gap items are justifiably associated with groundwater. This is consistent with page ES-3, which includes a listing showing that 6 of the 7 data gap items are associated with groundwater. To this reviewer, it appears that the primary overall objective of the work plan is to obtain data that will allow for estimates of mass and mass flux of perchlorate and chlorate in groundwater.
 - a. Describe the methodology to be used to quantify mass flux.
 - b. On Table 6-6, why are some wells being tested using the ‘new well recovery test’ whereas others are being tested using the ‘step-specific capacity test’? Provide a brief description of the methodology associated with these tests. List the methodology/methodologies to be used to quantify hydraulic conductivity.
10. Section 6.2 Investigation Objectives, page 27, 5th bullet. The Deliverable states that “Re-evaluation of previous interpretations of the top of the UMCf by synthesizing available stratigraphic data from previous investigations along with the results of this investigation.” Interpretations of the top of the top of the Muddy Creek and particularly the transitional Muddy Creek have varied between the BMI Companies. NDEP requests specifically how this will be done, e.g., explain how or what methods will be used to synthesize the data.
11. Section 6.4 - Investigation of the Deeper Shallow WBZ and Upper Middle WBZ, New Monitoring Wells: Section 6.4 includes information about the proposed investigation and the planned installation of new groundwater monitoring wells in the Eastside Study Area. According to Table 6-5 the new wells are proposed to be constructed with 15 or 20-foot long well screens. Note 1 of Table 6-5 states that well construction details may be modified based on the lithology encountered during drilling. Section 6.4 should be revised to provide a general rationale for the proposed well screen lengths presented in Table 6-5. Additionally, revisions should provide a brief rationale for a scenario that might require deviating from the proposed well screen length specifications per Note 1 of Table 6-5.

12. Section 6.4 Investigation of the Deeper Shallow WBZ and Upper Middle WBZ, New Monitoring Wells--Soil Borings, page 29, 1st paragraph. The Deliverable states that “To support this calculation, selected soil samples will be tested for fraction organic carbon (foc), porosity, and bulk density to provide site-specific soil properties that will be used to improve the partitioning assumptions and resulting mass estimates.” The NDEP requires that ASTM methods be used for these soil analyses:
 - a. Soil Dry Bulk Density ASTM D2937;
 - b. Grain Density ASTM D854;
 - c. Soil Moisture Content ASTM D2216;
 - d. Grain Size ASTM D422 by both sieve and hydrometer for soil particles finer than 75 μm , No. 200 sieve.
 - e. Fraction Organic Carbon Walkley-Black method (Nelson and Sommers, 1992); and
 - f. Soil pH – ASTM 4972.
13. Section 6.6 Comprehensive Groundwater Sampling, page 30. The NDEP requires that DO and ORP be added to the field parameter list.
14. Section 6.7- Hydraulic Characterization: This section describes characterization methods proposed to better understand the hydraulic properties of the aquifer system in the Eastside Study Area. Section 6.7 should be revised to address the following comments: (1) indicate what aquifer system hydraulic properties (e.g. transmissivity) will be estimated by conducting the single well recovery and hydraulic tests and what methods will be used to evaluate the data, (2) provide additional methodology and rationale to explain how the single well recovery tests at new wells will be accomplished during development in a way that prevents or limits the potential effects of incomplete well development on the recovery test results, and (3) Section 6.7 indicates that transducers will be installed within approximately 25 monitoring wells in the Eastside Area (excluding the Northeast Area). Conversely, the text also says that the proposed locations of the transducers will be updated as necessary to include existing wells in the Eastside Study Area (i.e, the Eastside and Northeast Areas), depending on the condition of the wells following inspection. Section 6.7 should be revised to address contradictory statements about where the transducers may be installed as part of the investigation.
15. Section 6.8 Delineation of the Top of Muddy Creek Formation, page 31. 1st bullet at bottom of page. The Deliverable states that “The 2003 survey was conducted within the BMI Common Area and may have also included five transects across Las Vegas Wash (*italic emphasis added*). The five transects referenced herein were four transects across Las Vegas Wash and one perpendicular to a postulated fault zone that cut across the Wash where basement rock material was exposed in the Wash about 1.8 miles downstream of the Pabco Weir at this location. Further, boring logs from TIMET’s investigation where the transitional MCF was logged to depth of 165 ft bgs (attached) which is an apparent lithologic anomaly. Additionally, BRC’s investigators reinterpreted the boring log for AA-27 which is another apparent anomaly (Exhibit 2). The Deliverable would also benefit from the addition of the depictions of the paleochannels on a figure.
16. Figure 6-4 Paleochannel Interpretations. Please label each planned transect and justify why the south most transect is needed.

Minor Corrections

1. Section 2.6 Climate, last sentence, p. 7. Kerr-McGee (1985) is a secondary reference. NDEP requests using as a primary reference on evaporation potential Shevenell, L., 1996, Statewide Potential Evapotranspiration Maps for Nevada, Nevada Bureau of Mines and Geology, Report 48, pp. 32 or any appropriate primary reference.
2. Section 2.7.3 Local Hydrogeology, 1st paragraph, p. 10. Values of ‘hydraulic conductivity’ and ‘permeability’ are given in units of length per time, suggesting that the terms are interchangeable. For clarity, use one term and provide the values in consistent units (i.e., feet per day).
3. Section 4.2.2 Preliminary Groundwater Conceptual Site Model, 4th paragraph, p. 18. The date for inception of the IWF is documented please provide a date in lieu of the general reference “many years.”
4. Section 6.3 Inspection and Initial Sampling of Existing Wells, p. 28. NDEP requires that all information from the well inspection will be provided to the NDEP to update the All Wells Database.
5. American Pacific (AMPAC) listed as “AMPAC” in the legend should be a call-out label on the map of Figure 1-2. Please label the TRECO parcel (immediately south of the west end of the WAPA parcel off the southeast corner of the Olin parcel.

References

Shevenell, L., 1996, Statewide Potential Evapotranspiration Maps for Nevada, Nevada Bureau of Mines and Geology, Report 48, pp. 32.