



environmental management, inc.

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Date: July 15, 2010

To: Shannon Harbour, P.E.
Nevada Division of Environmental Protection

RE: Response to June 22, 2010 Nevada Division of Environmental Protection (NDEP) Comments and June 23, 2010 NDEP Additional Comments on *Draft Excavation Plan for Phase B Soil Remediation of RZ-B*, Tronox LLC, Henderson, Nevada, dated June 10, 2010

RESPONSE TO COMMENTS

Northgate Environmental Management, Inc. (Northgate) submits this Response to Comments on the *Draft Excavation Plan for Phase B Soil Remediation of RZ-B* (EP) on behalf of Tronox LLC (Northgate June 10, 2010). Tronox has reviewed the June 22 and 23, 2010 NDEP comments and has revised the EP document accordingly.

Remediation Zone (RZ) B EP TEXT AND FIGURES

NDEP June 22, 2010 Comments on EP

- 1. General comment, TRX does not mention confirmatory sampling in this Deliverable. If the existing data are adequate such that confirmatory data will not be collected, the data usability evaluation portion of the risk assessment should document that the post-excavation database is sufficient to delineate nature and extent for purposes of COPC selection and exposure point concentrations (EPCs), for all exposure (soil depth) scenarios. Except as otherwise discussed for specific remediation polygons or sampling locations, TRX should have data to support a human risk assessment (HRA) for the final grade 0-10 fbg interval. Please discuss as necessary for clarity and transparency in the revised Deliverable.*

Response: As part of the risk assessment, an evaluation of all validated data will be conducted to document soil concentrations removed from further evaluation due to soil removal activities and remaining chemical concentrations. The risk assessment will discuss the sufficiency of the data to identify the chemicals of potential concern (COPCs) and select an EPC for the exposure scenarios evaluated in the HRA. An additional section (Section 1.3, Data Evaluation) has been added to this EP, dated July 15, 2010, describing how the data have been used to identify remediation polygon areas through use of Appendix A tables and to identify the remaining data that will be used in the HRA.

- 2. General comment, typographical and grammatical errors are not addressed by these comments. Please implement a thorough [sic] QA/QC protocol prior to submitting Deliverables to the NDEP.*

Response: Several typographical and grammatical errors have been addressed in this EP, dated July 15, 2010.

3. *General comment, NDEP acknowledges that some of the issues listed below were clarified on the June 15, 2010 telephone call; however, these issues should also be clarified in this Deliverable, as appropriate, and in the Response to Comments letter.*

Response: The EP has been revised to clarify the issues discussed on the June 15, 2010 telephone call, including additional step-out and property boundary sampling, excavation backfill, pending data, chemicals driving excavation and remediation polygon development.

4. *General comment, NDEP noted on the June 15, 2010 telephone call that additional samples will be taken to refine the understanding of the nature and extent of contamination. NDEP requests that confirmation samples be taken at the property boundary wherever property boundaries are used to constrain remediation areas.*

Response: Tronox performed additional sampling, including step-out sampling and proposes sampling at property boundaries used to constrain remediation areas. The EP has been updated with the most recent additional sampling results; however, Tronox has not yet received all of additional sampling data. When these data become available, errata to this document will be prepared presenting the data and any changes to the EP.

5. *General comment, While NDEP has stated in previous meetings and conference calls that NDEP will not regulate backfill, the following should be clarified:*

- a. *NDEP did not mean to imply by “not regulating backfill” that NDEP was not concerned with backfill sources especially if Site soils will be used.*
- b. *By stating that NDEP will not regulate backfill; NDEP was establishing that NDEP will not grant or deny approval of a backfill source.*
- c. *However, the TRX needs to collect sufficient data for a Human Risk Assessment. This is especially true if Site soils will be used as backfill.*

Response: Section 3.4 (Post-Excavation Backfilling) of this EP, dated July 15, 2010, has been revised to reflect that NDEP will not regulate backfill.

6. *General comment, the Revised Deliverable should be a final document; however, NDEP understands that some data has not been received, which would prevent final maps from being prepared. Any maps that are affected by this pending data should be marked draft and final maps should be submitted as errata after the data has been received. NDEP would need to approve any errata submittals to this Deliverable.*

Response: Maps included in this document, dated July 15, 2010, are affected by pending data and are marked as “draft”. After the data are received, final maps will be submitted as errata to the EP for NDEP review and approval.

7. *Section 1.3, pages 4-5, NDEP has the following comments:*

- a. *2nd paragraph, last sentence, TRX should change the word “Site” to “RZ-B”.*



- b. *Last paragraph, TRX should note that one of the existing utilities near the Unit Buildings is the existing chlorine transmission line. This utility should be clearly marked on Figure [sic] 2. Additionally, great care should be taken to protect this utility.*

Response:

- a. This change has been made to the new document within Section 1.4, Page 5, 2nd paragraph, last sentence.
- b. The revised document (Section 1.4, Page 5, last paragraph) includes a note regarding protection of the chlorine transmission line which runs mainly overhead across the site. The existing chlorine transmission line is clearly marked as a utility on Figure 2 of the EP.
8. *Section 2.0, pages 6-7, NDEP provides the following comments:*
- a. *2nd paragraph, NDEP has the following comments:*
- i. *NDEP disagrees with TRX's statement regarding the Unit Buildings not being a source of contamination to the sub-surface. For example, the basement of Unit Building 4: NDEP does not believe that TRX has demonstrated whether this area may or may not be a continuing source of contamination to soils and groundwater. TRX should clarify these statements based on a leachable or non-leachable compounds basis and Unit Building-specific basis.*
- ii. *Please clarify the construction of the LOU #28 containment area relative to site operational history.*
- iii. *Please clarify that LOU #28 is currently operational.*
- b. *Bulleted list, please indicate the approval status of all referenced Deliverables.*

Response:

- a.i. Statements that refer to Unit Buildings as not sources of contamination to the sub-surface have been removed from the revised document. There have been a variety of soil samples obtained adjacent to the Unit Buildings that are being evaluated as part of the Site-wide leaching evaluation. In addition, soil borings (SSAR3-01 and SSAR4-04) have been advanced to confirm that shallow contamination is not present beneath the buildings.
- a.ii. and a.iii. The EP has been revised to clarify that the area where Letter of Understanding (LOU) #28 was located is no longer in use. Between approximately 1983 and about 1994, Tronox stored hazardous wastes on a concrete pad. The area was excavated for remediation before two above-ground storage tanks, including a secondary containment pad and berm were constructed between 1994 and 1998. The two existing tanks were used to store chlorate solutions from the sodium chlorate process, but are no longer used (ENSR, 2008).
- b. The EP has been revised to include the regulatory approval status of all referenced



Deliverables.

9. Section 3.3, page 9, NDEP provides the following comments:
- a. *Please explain how the unknown data was factored into the Theissen polygon development. For example, was it assumed that the data was “clean” or that the data was non-existent?*
 - b. *1st full paragraph, any excavation that is not planned to be backfilled needs to be discussed with NDEP. TRX also needs to consider how these excavations will factor into the post-closure risk assessment as a new 0-10 feet below ground surface (fbgs) soil horizon would have been created by way of leaving the excavation open.*
 - c. *2nd full paragraph, please clarify if the target excavation depth will be modified due to the presence of visual staining, odors, or other indications.*
 - d. *4th paragraph, NDEP does not agree with TRX’s statement regarding pavement being a constraint to excavation for the following reasons:*
 - i. *No information has been presented to date nor is it reasonable to expect that such information exists that pertains to the exact date of installation of the pavement.*
 - ii. *Much of the pavement throughout the Site is in poor condition and is not considered a barrier to contaminant transport.*
 - iii. *Unless TRX can demonstrate that the pavement was installed prior to the initiation of the Basic Magnesium operations and maintained in such a manner as to prevent contaminant transport, NDEP rejects TRX’s hypothesis that the pavement is a barrier to any contaminant transport.*

Response:

- a. Soil borings in which all data are pending (dp) were not considered in the development of the polygon excavation areas. As indicated above, as data are received, errata will be provided to NDEP.
- b. Table 1 of the revised document, dated July 15, 2010, indicates the areas and thickness of backfill that Tronox anticipates for each excavation area. As noted, with the exception of the Unit Buildings, only shallow excavation areas (i.e., less than 1 foot bgs) are not anticipated to be backfilled. These shallow excavation areas will not create a new soil horizon, and in all instances, pre-confirmation samples have been obtained in these areas.
- c. The EP has been revised to clarify that the target excavation depth will be modified due to the presence of visual staining, odors, or other indications.
- d. Tronox performed additional sampling in paved areas and revised associated polygons, i.e. RZ-B-23.



10. Table 1, NDEP has the following comments:

- a. TRX does not discuss how the remediation polygons were developed. TRX should note whether physical barriers such as buildings and roads impacted the polygon boundaries and how LOU boundaries were considered in the polygon construction. TRX should add columns to Table 1 addressing which remediation polygons were affected and how these remediation polygons were affected by these boundary issues.
- b. Please include a column for backfill designation and information on proposed final grade difference from the original (pre-excavation) grade.

Response:

- a. Table 1 has been revised to include a column describing "Excavation Boundary Modifications." Additionally, the Appendix A tables clearly show the data used to define and bound/border each polygon excavation area.
- b. Table 1 has been revised to include a column describing "Anticipated Excavation Backfill/Depth from Top of Adjacent Grade to Top-of-New Fill."

11. Figures 1 and 3, NDEP provides the following comments:

- a. Note regarding arsenic, TRX states "However, for arsenic there are some exceptions based on conceptual site model considerations." Each of these exceptions needs to be discussed in detail and approved by the NDEP.
- b. Please clarify whether the "-" means no sample was collected for that depth.
- c. Please combine the information presented in Figures 1 and 3 into one Figure. NDEP understands that the map may need to be broken into smaller areas for clarity that may result in multiple Figures for the RZ-B area.
- d. Please add the NDEP BCLs (or whatever metric is being utilized) to this Figure.
- e. General comment, the shapes and derivation of the polygons is not transparent. Please discuss in detail.
- f. General comment, there does not appear to be any consideration of the soil-to-groundwater leaching pathway and any excavation that might be required to address this. In addition, this needs to be clarified in Section 1.0 regarding the definition of "contaminated". Please clarify.
- g. Location RSAQ4, this is a very odd distribution profile for alpha-BHC and TRX should consider excavating the 10-11.5 fbgs sample and/or performing additional step-out or vertical profiling samples in this area (concurrent with the general RZ-B excavation).
- h. Location RSAS8, no remediation polygon appears to be associated with this sample location even though the asbestos concentration is greater than the "contaminated soil" definition. Please review and revise and necessary.



- i. *RZ-B-07 (Location SSAQ4-03), additional vertical delineation data will need to be collected at this location before, during or after the RZ-B excavation. Please discuss.*
- j. *RZ-B-11, NDEP has the following comments:*
 - i. *Based on review of these Figures, NDEP is unsure which samples are associated with the remediation polygon.*
 - ii. *Location SA136, TRX should clarify whether this sampling location is within this remediation polygon and if so what is constraining the remediation polygon associated with this sampling location. If this sampling location is not associated with RZ-B-11, please add a remediation polygon for this location as the contaminate concentrations meet the “contaminated soil” definition.*
 - iii. *Location RSAQ5, TRX should clarify whether this sampling location is within this remediation polygon and discuss whether the contaminate concentrations meet the “contaminated soil” definition.*
- k. *RZ-B-13 (Location SA05), please clarify why a depth of 6 fbgs was chosen for this remediation polygon.*
- l. *RZ-B-15 and RZ-B-18 (Locations SA110 and SA191, respectively), TRX should clarify how the 8’ depth of excavation was derived for these locations. Based on the June 15, 2010 conference call, NDEP understands that this is the depth of the basement and the intention is to remove contaminated rubble in the basement. Please clarify this in the revised Deliverable.*
- m. *RZ-B-19 (Location SA32), please clarify why this remediation polygon is not further constrained by SSAR6-03.*
- n. *RZ-B-20 (Location SSAR6-04), please clarify why a cutline of 2 fbgs was established when perchlorate contamination is observed through out the soil column.*
- o. *RZ-B-22 (Location SA77), TRX should clarify why the remediation polygon associated with this sampling location does not extend to the property boundaries.*

Response:

- a. This language has been removed from the figures included with the revised document.
- b. The revised EP includes a note explaining the meaning of “-“ and “SH” (screening data above comparison levels).
- c. Figures 1 and 3 have been combined in the revised document.
- d. NDEP basic comparison levels (BCLs) have been added to Figure 1.
- e. The EP has been revised to include a discussion on shapes and derivation of the polygons.



- f. Section 1 of the EP has been revised to address the issue of leaching. For purposes of this EP, "contaminated soil" is not defined based on leaching potential to groundwater. A separate site-wide leaching evaluation is being conducted. As the evaluation is finalized, errata to this plan will be provided to address this pathway.
- g. Location RSAQ4, Tronox performed additional sampling at this location and has revised the polygon.
- h. Location RSAS8, Tronox has revised the polygon (formerly RZ-B-21; RZ-B-23 in the revised document).
- i. Formerly RZ-B-07; RZ-B-06 in the revised document (Location SSAQ04-03), Tronox performed additional sampling at this location and revised the polygon (data is pending).
- j. Formerly RZ-B-11; RZ-B-13 in the revised document (Location SA136), has been altered to show the correct location. The revised polygon shape includes RSAQ5.
- k. RZ-B-15 and RZ-B-18 in the revised document (Locations SA110 & SA191), the EP has been changed to clarify that these locations will be excavated to the bottom of the basement, a depth of the 8 feet bgs, to remove debris above the concrete slab.
- m. RZ-B-19 in the revised document (Location SA31), Tronox altered the polygon to be constrained by SSAR6-03.
- n. RZ-B-20 in the revised document (Location SSAR6-04), Figure 1 has been altered to show the cutline for RZ-B-20 at 4 feet bgs.
- o. Formerly RZ-B-22; RZ-B-24 in the revised document (Location SA77), the EP has been changed to show the remediation polygon associated with this sampling location to extend to the property boundaries.

12. *Figure 2, please add the chlorine transmission line to this Figure.*

Response: Figure 2 has been revised to include the chlorine transmission line.

13. *Appendix A, NDEP provides the following comments:*

- a. *General comment, the comparison metric(s) need to be added to all of the tables in this Appendix.*
- b. *General comment, there are locations that exceed the applicable comparison metric in the tables that require further explanation and approval by NDEP. Some of these are less than 10 fbgs and it is not clear why they are not being excavated.*

Response:

- a. The EP has been revised accordingly.
- b. The Appendix A highlights four instances of this occurrence. Two are soil locations



associated with perchlorate (SSAR6-04 and RSAR7), in which soil excavation is limited by utilities, and two are borings associated with arsenic at depths greater than 10 feet bgs (SA4 and SA203).

NDEP June 23, 2010 Additional Comments on EP

1. *Figures 1 and 3, TRX should provide data for the chemicals driving excavation and remediation polygon development for those sample locations adjacent to remediation polygons and/or used for refinement of the remediation polygons.*

Response: The EP has been revised to include columns for chemicals driving excavation and excavation boundary modifications on Table 1. Additionally, the Appendix A tables clearly show the data used to define and bound/border each polygon excavation area.

2. *Appendix A: the Table found in this Appendix should be combined into one Table for ease and usefulness during review.*

Response: A revised Table A has been provided with this EP.

