northgate
environmental management, inc.

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Date: November 3, 2010

To: Shannon Harbour, NDEP

RE: Nevada Division of Environmental Protection (NDEP) Response to: *Excavation Plan for Phase B Soil Remediation of RZ-E, Addendum to the Removal Action Work Plan, Tronox LLC, Henderson, Nevada,* dated July 27, 2010

Northgate Environmental Management, Inc. (Northgate) submits this Response to Comments on behalf of Tronox LLC (Tronox).Tronox has reviewed the July 27, 2010, Nevada Division of Environmental Protection (NDEP) comments and responds accordingly.

1. *General comment, TRX states throughout this Deliverable that excavation will not be conducted in excess of 10 feet below ground surface (fbgs). NDEP does not believe that this statement meets the intention of the December 14, 2010 Order issued by NDEP to TRX. The Deliverable should be revised to address source control and leaching. Please note that the following comments do not address each instance this topic is mentioned in the Deliverable.*

   Response:
   The Excavation Plan (EP) has been revised to remove references to limiting excavations to a depth of 10 feet. It is Tronox's intent to excavate as deep as possible using conventional excavator equipment to remove soils with concentrations exceeding Comparison Criteria, except for perchlorate. Perchlorate will be remediated using in situ methods including soil flushing and bioremediation. A leaching evaluation has been performed. If revisions to this EP are required based on the NDEP approved leaching evaluation, an errata will be prepared.

2. *General comment, TRX should label the proposed sampling locations and include the names for the sampling locations throughout the document, especially in Figure 1.*

   Response:
   Figure 1 has been revised to include the labels for all of the sampling locations. Sampling locations are referred to by name, as appropriate, in the EP.

3. *Section 1.0, page 1, NDEP provides the following comments:*
   a. *2nd paragraph, TRX notes that this Deliverable does not address the soil-to-groundwater leaching pathway. As NDEP has previously stated to TRX, this represents a schedule concern for the NDEP.*
   b. *3rd paragraph, NDEP does not agree with TRX's definition of contaminated soil per the above-comments.*

Response:

a. Tronox has evaluated the leaching potential and has prepared a memorandum for review by NDEP. If revisions to this EP are required based on the leaching evaluation, an errata will be prepared.
b. The definition of contaminated soil has been revised to define Contaminated Soil with the same definition presented in previous EP documents that have been approved by NDEP.

4. *Section 1.1, page 2, 2nd paragraph, NDEP notes that gravel filled bags are not a blockade to surface water transport. It is noted that additional Best Management Practices (BMPs) may be needed during the implementation of the scope or work to limit the transport of contaminants.*

Response: The gravel filled bags were not intended to prevent surface water from leaving the Site. The intent was to minimize the potential for movement of sediment off the Site. This is now stated in Section 1.1. An earthen berm is present near the eastern end of the Beta Ditch. The earthen berm does prevent movement of surface water from leaving the Site from areas upstream of the earthen berm.

5. *Section 1.2, pages 2-4, NDEP provides the following comments:*
   a. *1st paragraph, page 2, TRX states that that the Beta Ditch historically terminated at the AP Maintenance Shop are refers to Figure 1. NDEP did not observe this noted on Figure 1. Please revise one of the included Figures to note this area. Revise the text as necessary.*
   b. *1st paragraph, page 3, TRX provides rationale for limiting the excavation depth for a portion of the Beta Ditch; however, TRX proposes a 10 fbgs cutline for the entire RZ-E area. TRX also did not provide Conceptual Site Model (CSM) rationale for the excavation limits. Please clarify.*
   c. *2nd paragraph, page 3, NDEP provides the following comments:*
      i. *Please provide additional discussion for the inclusion of 25 feet from both sides of the ditch sidewalls as the boundary for this area. CSM rationale and sampling results should be used in the discussion of establishing a width for the excavation area for RZ-E.*
      ii. *Please provide the rationale for additional sampling transects including the rationale for the location of each transect. NDEP suggests that if TRX proceeds with the transect sampling that the transects are located in areas of historic overflow and areas with apparent/potential flow restrictions.*
      iii. *TRX should note that any delay in the remediation schedule to accommodate any sampling will not be acceptable to NDEP.*
   d. *4th paragraph, page 3, TRX has stated in various meetings that the Beta Ditch might be used as part of a site-wide storm water retention basin in the future. Please discuss if this is still intended and if so, then backfilling may not be necessary or limited based on the data available for risk assessment. TRX should note that this is not an issue that should delay the implementation of this plan; however, this issue needs to be resolved prior to initiating backfilling.*

Response:

a. Figure 1 has been revised to show the location of the Maintenance Building.

b. The excavation limits and depths have been revised based on the chemical data

developed during the Soil Investigation Programs and the transect sampling. The previous RZ-E excavation area is now revised to include 16 excavations areas. The limits of the areas were developed using the chemical data and conservative assumptions by generally carrying the deeper remediation depth to the next shallower depth. In the bottom of the ditch, depths were generally divided at the midpoints between samples except where a minimum of 1 foot was maintained in non-impacted or very shallow impacted areas. Side areas were generally extended to the RZ-E boundary unless transect data were available for more detailed definition.

c.

i. The RZ-E boundary was established in concert with NDEP to be 25 feet beyond the Beta Ditch top-of-slope. The excavation area limits were set based on the transects where possible and the limits of the beta Ditch where the transect data was not consistent with sampling data in the area outside of the top-of-slope.

ii. The rationale for locating the transects is presented in Section 1.2. Transect No. 3 was located in an area where historic overflows were likely.

iii. Tronox understands NDEP's position on delays of remediation.

d. Tronox continues to pursue construction of a retention basin in RZ-C and a portion of RZ-E. The intent of the retention basin is to store a portion of the 100 year storm and to facilitate natural flushing of perchlorate in the area of the basin. The basin is located in a perchlorate impacted area. One page of the grading plan that shows the RZ-C/RZ-E retention basin is included in the EP for NDEP's review.

6. *Section 2.0, page 5, NDEP provides the following comments:*
   a. *NDEP does not concur with TRX's proposal to sample for only the chemicals that are driving remediation at a particular sampling location. TRX should also consider adjacent sampling locations and any chemicals associated with those sampling locations. Please clarify what chemicals are being sampled for the additional samples. TRX should note that restrictions to excavation limits will not be considered by NDEP unless the necessary chemical drivers are reported.*
   b. *TRX proposes additional samples for the refinement of the excavation area cutlines; however only one excavation area that does not consider the analytical data has been presented. Please clarify TRX's intentions for RZ-E excavation.*
   c. *Additionally, TRX should note that NDEP does not find it acceptable for the additional sampling results to delay excavation of this area including the submittal of the final excavation plan for RZ-E.*

Response:

a. Tronox's additional sampling in RZ-E was designed to incorporate chemicals driving remediation as well as chemicals found in adjacent sampling locations.

b. The intent of the additional sampling was to allow the previous one excavation area to be better defined and allow the area to be subdivided into smaller areas whose boundaries and depth of excavation are based on the chemical data. This has been accomplished and is now in the EP.

c. Tronox understands NDEP's position on delays of remediation.

7. *Section 3.0, page 7, NDEP does not necessarily agree that the listed excavation boundary constraint is a practical constraint, please clarify using CSM rationale why this is considered a valid constraint.*

Response:

In drawing the boundaries and depths of the excavation areas in RZ-E, Tronox has differentiated between samples taken in the bottom of the ditch from those that were taken at or outside the top-of-bank. In Tronox's opinion, the samples in the bottom of the ditch and in banks at the depth of the ditch are impacted due to the former liquid waste stream. Samples at shallow depths outside the top-of-bank are impacted due to short duration overflow conditions or more likely from operations in the vicinity of the ditch. Therefore in the case of contamination at shallow depths outside the top-of-bank, the sampling locations have been used to develop excavation areas extending into RZ-C and RZ-D as shown on Figure 1 of this EP.

8. *Section 3.1, page 7, as noted above, NDEP does not agree with TRX's proposal to sample for only the chemicals that are driving remediation for a particular sampling location. Please see NDEP's above-comments for further guidance.*

Response:

The selection of chemicals for boundary samples has been made based on chemical driving remediation as well as chemicals that exceed Comparison Criteria in adjacent areas. At the western property line, a pre-confirmation sample could not be collected at this time due to physical obstructions. This sample will be collected at the time of remediation.

9. *Section 3.3, please clarify the construction of the equalization tank area including the existence of Site soils within the area.*

Response:

A description of the Equalization Tank conditions is presented in Section 3.3.

10. *Section 4.2, page 8, in regards to any monitoring wells within RZ-E that will be affected by excavation, TRX should propose (with justification) in this Deliverable whether to maintain these wells or abandon them with or without replacement.*

Response:

Tronox has submitted a memorandum to NDEP to propose disposition of wells in RZ-E. Tronox is awaiting NDEP's response.

11. Table 1, please clarify the following:

a. If the listed metric for benzo(a)pyrene (BaP) is for BaP TEQs or BaP.

b. If this Table represents the analyte list for the additional sampling.

Response:

a. The metric for reporting B(a)P is for B(a)P TEQs.

b. No, Table 1 presents the chemical(s) driving the remediation and also lists the names of the pre-confirmation sampling locations. The analytes tested for at the pre-confirmation testing location are presented in Appendix A.

12. Figure 1, NDEP provides the following comments:

a. It appears that data and sampling locations from RZ-C and RZ-D adjacent and in the vicinity of RZ-E are missing. Please include the data from these sampling locations including but not limited to RSAL8, RSAM2, RSAM3, RSAM8, RSAN7, SA62, SA69, SA 67, SA71, SA76, SA100, SA144, and SA157.

b. NDEP provides the following comments only if TRX decides to complete the transect verification sampling:

i. Transect sampling should target areas of historic overflow or apparent/potential flow restriction.

ii. A transect could be added near sample location SA-175 because of contamination profiles in that area.

iii. A transect could be added near sample location SA-128 because of intersection of two drainages and the potential for historical ditch overflow.

Response:

a. The adjacent data in RZ-C and RZ-D have been included in Figure 1.

b.

i. Transect No. 3 was drilled in an area that had a potential for overflow.

ii. The four transect locations had already been selected prior to receipt of NDEP comments. The rationale of the selection process in explained in Section 1.2.

iii. Transect No. 2 also is considered representative of the former waste stream and storm water exiting the Tronox system and flowing into the Beta Ditch. A comparison of Transect No. 1 and No. 2 data gives an indication as to the chemicals that impacted the ditch from Tronox and from the area west of the Site.

13. Appendix A, it appears that these tables do not include data deeper than 10 fbgs. Please revise the tables to include all available data for RZ-E that includes data from other RZs as necessary to support this Deliverable.

Response:

Appendix A has been revised to include data from depths greater than 10 feet.