northgate
environmental management, inc.

From: Deni Chambers
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Date: October 18, 2010

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

RE: Response to NDEP's October 5, 2010 Comments on:
Revised Excavation Plan for Phase B Soil Remediation of RZ-D, Addendum to the Removal Action Work Plan, dated August 31, 2010;

WebEx Meeting between NDEP and Northgate Environmental Management, dated September 27, 2010;

Errata to Addendum to the Excavation Plan for RZ-D, Concerning Set-Backs for GW-11 and WC Pond Embankments and Changes to the Proposed Excavation Areas, dated September 27, 2010;

NGEM E-Mail: *Setback Update*, dated October 4, 2010; and

NGEM E-Mail: *RE: Information request regarding RSAI7*

Northgate Environmental Management, Inc. (Northgate) submits this Response to Comments on behalf of Tronox LLC (Tronox).Tronox has reviewed the October 5, 2010 Nevada Division of Environmental Protection (NDEP) comments and responds accordingly.

1. *General comment, TRX should contact NDEP **by October 8, 2010** to schedule a conference call to discuss these comments or to advise NDEP that TRX plans to implement work in accordance with these comments. Additionally, NDEP does not plan to review any errata or written response-to-comments provided by TRX until such time as all of the RZ-D sampling data has been received or otherwise determined by NDEP.*

   Response:
   Tronox has contacted NDEP as requested and plans to implement the changes in accordance with NDEP comments as noted in this RTC.

2. *General comment, NDEP acknowledges TRX establishment of a temporary setback around GW-11, WC-West, and WC-East (Active Ponds) until NDEP approves the final setback based on TRX's submittal of a slope stability document. NDEP understands that TRX will collect the necessary geotechnical data for calculation of the minimum setback required for slope stability of the Active Ponds berms and that the current deadline for submittal of a slope stability document is **October 18, 2010**.*

Response:
Tronox has prepared the revised slope stability document and is being submitted concurrently with this document. The revised memorandum concludes that no setbacks will be required provided excavation cut slopes are graded at a 3 horizontal to 1 vertical slope.

3. *General comment, to avoid confusion due to multiple issuances of comments, NDEP lists each excavation area with the contaminated sample location(s) that is/are driving excavation for a particular remediation polygon along with the sampling locations that determine the limits of the remediation polygon. The following protocol should be used unless conceptual site model (CSM) rationale is used to modify.*
    a. *The basis for deriving the excavation polygon lateral and vertical extents is summarized below; however, these comments may not be comprehensive and TRX should note that the lack of an NDEP comment on specific instances where this methodology was not followed does not relieve TRX's obligation under the Order to complete the excavation in accordance with these criteria:*
        i. *The depth of the excavation polygon was determined by the depth to a non-contaminated (i.e. less than BCLs or background) sample in the contaminated sampling location.*
        ii. *The lateral limits of excavation for the Voronoi diagrams/Thiessen polygons were generated by determining the half-way point between defining contaminated sampling location(s) and adjacent non-contaminated sampling locations or adjacent contaminated sampling locations with a different depth of excavation determination.*
        iii. *Upon NDEP approval, conceptual site model (CSM) rationale may be used to constrain the limits of excavation; however, TRX must present the justification and receive approval for the constraint prior to implementation.*

Response:
Tronox acknowledges the statements contained in this comment and agrees to the procedures. Tronox has attempted to set the excavation area depths and limits in accordance with these criteria. There are a few exceptions where CSM rationale has been utilized to set the excavation limits. These instances have been discussed with NDEP during the course of the review process.

4. *Section 3.4, page 16, TRX continues to defer the issue of how risk assessments will be conducted in areas where backfill is <u>not</u> proposed to be placed. Therefore, NDEP provides the following:*
    a. *If excavation that will not be backfilled is less than or equal to 5 feet below ground surface (fbgs), TRX may use the current 10 fbgs data to represent the new 0 – 10 fbgs range.*
    b. *Excavations greater than 5 fbgs either need to be backfilled to pre-excavation grades or a post-excavation 10 fbgs sample must be collected and used in the risk assessment.*

Response:
Tronox intends to follow the NDEP proposed criteria contained in this comment when preparing the health risk assessment to address those areas of the Site where the excavation area will not be fully backfilled.

5. *Table 1: In comparison with Figure 1, several excavation polygons adjacent to the Site*

property boundaries do not appear to have boundary confirmation samples. Please collect boundary confirmation samples for the following:

a. *RZ-D-04A*
b. *RZ-D-12*
c. *RZ-D-13A*

Response:
Pre-confirmation samples will be taken at the noted locations.

6. *Table 2: NDEP provides the following comments:*
   a. *TRX should revise this Table based on the comments found in Attachment B.*
   b. *Please notify NDEP as soon as the pending results for the following sampling points are received so that a final depth of excavation can be established for the corresponding remediation polygons:*
      i. *SSAJ2-06 (RZ-D-06A)*
      ii. *SSAL4-04 (RZ-D-11B)*
      iii. *SA72 (RZ-D-28)*
      iv. *SSAK6-05 (RZ-D-17A)*
      v. *SSAM5-01(RZ-D-29)*
   c. *RZ-D-23B, based on the October 5, 2010 e-mail from NGEM describing the area surrounding RSAI7 that included photographs and a cross-sectional illustration of the area, NDEP concurs with the elimination of an excavation polygon based on RSAI7. TRX should continue to include this area in any proposed engineering control(s) for the Active Ponds area.*
   d. *RZ-D-26 / RZ-D-26A, TRX states that they have "elected to keep RZ-D-26 as one area instead of subdividing it as required by NDEP. TRX also reduced the excavation depth of RZ-D-26A from 0.5 fbgs to 0.33 fbgs. TRX did not collect a surface sample at SA189 for dioxins/furans TEQ concentration even though the 0.5-2 fbgs sample exceeded the 900 ppt TEQ approved protocol for the collection of a surface sample; therefore, TRX should excavation to 0.5 fbgs in remediation polygon RZ-D-26A to account for the possibility of elevated dioxins/furans at the surface. Please see Attachment B table and Figure C-2 for additional information.*
   e. *RZ-D-28 / RZ-D-28A, TRX states that they have "elected to keep RZ-D-28 as one area". Additionally, TRX states that this one area will be excavated to 10 fbgs. However, based on discussions on September 27, 2010 between NDEP and TRX and the September 27, 2010 Errata, NDEP understands that TRX will continue to investigate alternate remediation options for the perchlorate contaminated soils; therefore, TRX will excavate the asbestos contaminated soil and will recommend an alternative remedial method for the perchlorate-only contaminated soils. Please see Attachment B table and Figure C-4 for additional information.*

Response:

a. Tronox will revise Table 2 as noted in the NDEP comments and/or as noted in this RTC.
b.
   i. Data are still pending
   ii. Data are still pending
   iii. Data are still pending
   iv. The data have been received. The final depth is now 4 feet.
   v. The data are still pending
c. This area will be included in the area where engineering controls will be installed.

d. As indicated in this comment, Tronox will divide this area into RZ-D-26 and -26A and will deepen RZ-D-26A to 0.5 feet.
e. This area has been revised to reflect an excavation depth of 0.5 feet and the color has been changed to green to indicate that alternative remedial measures will be used to remediate for perchlorate.

7. *Figures: the limits for the following remediation polygons have been revised per these comments found in Attachment A, the Attachment B table, and the Attachment C Figures (Please note that TRX should not submit another Figure to NDEP until such time as all of the pending analytical data has been received and the Active Pond berms setback has been established [i.e. approved by NDEP]):*

Response:
The limits of these areas will be revised in the final plan as noted in this comment.

8. *Response-to-comment (RTC) 7.c. and Table 1, NDEP provides the following comments:*
   a. *RTC 7.c.i, RZ-D-5 does not list sample SSAI3-03-SW-E as indicated in the response, please revise Table 1 accordingly.*
   b. *RTC 7.c.ii, TRX indicates that data is available for sample location SSAJ2-05; however, this data is not presented on the Figure or in Appendix A. Please revise the Deliverable to respond to the NDEP's original comment.*
   c. *RTC 7.c.iii, TRX indicates that samples SSAJ3-08 and SSAK3-05 are being analyzed for dioxins/furans and HCB; however, Figure 1 does not show SSAJ3-08. If TRX meant to reference SSAK3-08, then this location should indicate that there is data pending. Please confirm sample locations and revise Figure 1 as needed.*
   d. *RTC 7.c.iv, TRX states that SSAL3-06 was collected to "define OCPs" because "surrounding soil samples indicate low dioxin/furan and HCB concentrations". However, TRX should note that RZ-D-14 cannot be reduced based on OCP concentration data alone. TRX did not collect a dioxins/furans TEQ surface sample for RSAL3 even though the TEQ concentration for RSAL3 was greater than 900 ppt as required by TRX's NDEP-approved surface sampling protocol. Therefore, NDEP considers dioxins/furans TEQ a driver for RZ-D-14 and requires dioxins/furans TEQ data to reduce the excavation limits.*
   e. *RTC 7.c.vi, HCB is not listed as driving remediation on Table 1. Please revise Table 1.*

Response:
a. Table 1 will be revised to list sample SSAI3-03.
b. The data will be added to the Figure and in Appendix A the samples were analyzed for HCB.
c. The sample referenced should be SSAK3-08. The data has been received and is now shown on Figure 1.
d. Sample SSAL3-06 was only tested for OCPs, therefore the excavation limits will not be reduced.
e. HCB was not tested for in RZ-D-24. The surrounding sampling locations including SSAK8-08, AK8-02, RSAK8, AK8-10, and AK8-07 were tested for HCB and no exceedances of HCB BCLs were noted.

Attachment B

NDEP Comment: *The following table is based on Figure 1: RZ-D Excavation Areas and Nature and Extent of Contamination (dated September 24, 2010). Note: yellow highlights indicate that Excavation Figures should be revised as indicated in the Attachment B table and Attachment C figures and blue highlights indicate that the depth of the excavation area has not been determined.*

Response:
The following changes from the table are indicated:
RZ-D-13A should remain at 4 feet due to 4 feet being the first clean sample depth.
RZ-D-15 should remain at 10 feet due to the presence of RSAJ6.
RZ-D-17A –the final data has been received and a depth of 4 feet is indicated.

Excavation Area	Contaminated Sampling Location	Adjacent Sampling Locations	Depth fbgs	Exceptions
RZ-D-01A	Hazardous Waste Landfill (HWL)	Limits of the HWL	24	
RZ-D-01B	RSAI3	SSAI2-01 SSAH3-01 RSAI2	16	Western cutline: western property boundary **HWL located within this area
	SSAI3-03-SW-W	SSAI3-03		
RZ-D-01C	RSAI2	SSAI2-01 RSAI3 SSAI2-02	15	Western cutline: western property boundary
RZ-D-01D1	SSAI2-02	SSAJ2-02 RSAI2	11	Eastern cutline: boundary of Trade Effluent Pond berm Western cutline: western property boundary **HWL located within this area
RZ-D-01D2			11	Eastern cutline: HWL boundary Western cutline: western property boundary
RZ-D-02	SSAJ2-02	SSAI2-02 RSAJ2	3	Eastern cutline: boundary of Trade Effluent Pond berm Western cutline: western property boundary
RZ-D-03 (C-1)	SSAI3-06	RSAI3 SSH3-01 RSAH3	4	
	SSAI3-02-SW-W	SSAI3-02		
RZ-D-04 (C-1)	SA201	SSAI3-01 SSAI3-05	10	Eastern cutline: toe of GW-11 pond berm (or approved setback)
	SSAI3-02-SW-E	SSAI3-02		

Excavation Area	Contaminated Sampling Location	Adjacent Sampling Locations	Depth fbgs	Exceptions
RZ-D-04A (C-1)	SSAI3-01	RSAH3 SA201 RSAI4	3	Northern cutline: Parcel C boundary
RZ-D-05 (C-1)	SSAI3-05	SA201 SSAJ3-01	8	Eastern cutline: toe of GW-11 pond berm (or approved setback)
	SSAI3-03-SW-E	SSAI3-03		
	SSAI3-04-SW-E	SSAI3-04		
RZ-D-06	RSAJ2	SSAJ2-02 HWL SSAJ2-01 SSAJ2-06	2	Western cutline: western property boundary
RZ-D-06A (C-1)	SSAJ2-06	RSAJ2 SSAJ2-01 SSAJ3-07 SSAJ3-03 SSAJ2-02	≥6	
RZ-D-07 (C-1)	SSAJ2-01	RSAJ2 SA206 SSAJ2-06	10	Western cutline: western property boundary
RZ-D-08	SA88	SSAK3-05 SSAK3-02 SSAK3-06 RSAK3	1	Eastern cutline: toe of GW-11 pond berm
RZ-D-08A	RSAK3	SSAK3-06 SA88	1.5	Eastern cutline: toe of GW-11 pond berm
RZ-D-10	SA202	RSAJ3 RSAJ3-04 SA88 SSAK3-01	0.33	Eastern cutline: toe of GW-11 pond berm
RZ-D-10A	SSAK3-01	SA202 RSAJ3 SA206 SSAK3-07 SSAK3-06	1	
RZ-D-10B	RSAJ3	SSAJ3-05 SSAJ3-03 SSAJ3-07 SSAK3-01 SA202 SSAJ3-04	0.5	

Excavation Area	Contaminated Sampling Location	Adjacent Sampling Locations	Depth fbgs	Exceptions
RZ-D-11	SA134	SSAK3-05 RSAL2 SSAL3-03 RSAL3-04 SA82 SSAK3-04	1	Eastern cutlines: toe of GW-11 pond berm
RZ-D-11A (C-2)	SA82	SSAK3-08 SSAL4-04 SSAL3-07 SSAL3-04 SA134	0.5	Northern cutline: toe of GW-11 pond berm (or approved setback)
RZ-D-11B (C-2)	SSAL4-04	SA82 SSAK3-08 SSAK4-01 SSAK4-02 SSAL4-05 RSAL4 SSAL3-07	≥1	
RZ-D-12	RSAL2	SSAK2-01 SA134 SSAL3-03 SSAL2-01	10	Western cutline: western property boundary
RZ-D-13	SSAL2-01	SSAL2-02 SSAL2-03 SSAL3-01 SSAL3-05 SSAL3-03 RSAL2	5	Western cutline: western property boundary
RZ-D-13A	SSAL2-02	SSAL2-01 SSAL2-03 RSAK2	3	Western cutline: western property boundary
RZ-D-14	RSAL3	RSAL2 SSAL3-05 SSAL3-02 SSAL3-04	1	
RZ-D-15 (C-3)	RSAJ5	SSAK6-02 RSAJ6	7	Western cutline: toe of GW-11 berm (or approved setback) Northern cutline: toe of WC-West pond berm (or approved setback)

Excavation Area	Contaminated Sampling Location	Adjacent Sampling Locations	Depth fbgs	Exceptions
RZ-D-15A (C-3)	RSAJ6	RSAJ5 SSAJ6-01 SSAK6-02	10	Northern cutline: toe of WC-West pond berm (or approved setback)
RZ-D-16	RSAK5	SSAK5-05 SSAK5-04 RSAL5	9	Western cutline: toe of GW-11 pond berm (or approved setback)
RZ-D-17	SSAK5-04	RSAK5 SSAK5-03 SSAK5-02 SA74 RSAL5	0.33	
RZ-D-17A	SSAK6-05	SSAK5-05 SSAK6-01 SSAK6-06 RSAK6 SSAK5-02 SSAK5-03	≥4	Final depth of excavation has not been determined. Additional sampling is required.
RZ-D-17B	SSAK6-01	SSAK5-05 SSAK6-02 SSAJ6-01 SSAK6-03 SSAK5-05	1	
RZ-D-17C	SSAK5-05	SSAK6-02 SSAK6-01 SSAK6-05 SSAK5-03 RSAK5	0.33	
RZ-D-18	SSAK6-02	RSAJ5 RSAJ6 SSAJ6-01 SSAK6-01 SSAK5-05	5	Western cutline: toe of GW-11 pond berm (or approved setback)
RZ-D-19	SSAK6-03	SSAJ6-01 SA127 SA76 SSAK6-06 SSAK6-01	3	
RZ-D-20	SA76	SSAK6-03 SA127 SSAK7-01	1.5	

		SSAK6-06		

Excavation Area	Contaminated Sampling Location	Adjacent Sampling Locations	Depth fbgs	Exceptions
RZ-D-21A (C-3)	SSAJ6-01	SSAK6-02 SSAK6-01 SSAK6-03 SA127	11	Northern cutline: toe of WC-West pond berm (or approved setback)
RZ-D-21B (C-3)	SA127	SSAJ6-01 SSAK6-03 SA76 SSAK7-01 RSAJ7	6	Northern cutline: toe of WC-West and WC-East pond berms(or approved setback)
RZ-D-21C (C-3)	SSAK7-01	SA127 SA76 SSAK6-06 SSAK7-06 RSAJ7	11	
RZ-D-21D (C-3)	RSAJ7	SA127 SSAK7-01 SSAK7-06 SSAK7-02	10	Northern cutline: toe of WC-East pond berm (or approved setback)
RZ-D-21E (C-3)	SSAK7-02	RSAJ7 SSAK7-06 SSAK7-05 RSAK7	14	Northern cutline: toe of WC-East pond berm (or approved setback)
RZ-D-21F (C-3)	RSAK7	SSAK7-02 SSAK7-05 SSAK8-05 SSAK8-09 SSAK8-04	10	Northwestern cutline: toe of WC-East pond berm (or approved setback)
RZ-D-22 (C-3)	SSAK8-04	RSAK7 SSAK8-09 SSAK8-02 SSAJ8-01	5	Western cutline: toe of WC-East pond berm (or approved setback)
RZ-D-23 (C-3)	SSAJ8-01	SSAK8-04 RSAJ8 SSAJ8-02 SSAK8-03	6	Western cutline: toe of WC-East pond berm (or approved setback)
RZ-D-23A (C-3)	RSAJ8	SSAJ8-01 SSAJ8-02	10	Western cutline: toe of WC-East pond berm (or approved setback) Northern cutline: property boundary with Parcel C

Excavation Area	Contaminated Sampling Location	Adjacent Sampling Locations	Depth fbgs	Exceptions
RZ-D-24 (C-3)	SSAK8-06	SSAK8-03 RSAK8 SSAK8-10 SSAK8-02	3	Eastern cutline: eastern property boundary
RZ-D-24A (C-3)	SSAK8-02	SSAK8-04 SSAK8-03 SSAK8-06 SSAK8-10 SSAK8-09	1	
RZ-D-25	RSAK8	SSAK8-10 SSAK8-06 SSAL8-01	1	Eastern cutline: eastern property
RZ-D-26 (C-2)	SA173	SA189 SA123 SSAL5-01	0.33	Northern cutline: Groundwater treatment system area
	SA19	SA179 SSAL5-07		
RZ-D-26A (C-2)	SA189	SSAL4-03 SSAL4-02 SSAL5-01 SA173 SA123 SSAM4-01	0.5	No surface sample for dioxins/furans TEQ was collected per the NDEP-approved surface sampling protocol established by TRX. Therefore, the depth of this polygon is based on the 0.5-2 fbgs sample as it is less than the modified dioxins/furans TEQ BCL.
RZ-D-27 (C-2)	SSAM4-01	SSAL4-03 SA189 SA70 SSAM4-03 SSAM4-04	0.66	Southern cutline: RZ-E cutline
RZ-D-28 (C-4)	SA72	SA167 SA20 SA73 RSAM6	≥0.66	**remediation alternatives will be investigated for perchlorate contamination Southern cutline: toe of AP-5 pond berm
RZ-D-29 (C-4)	SSAM5-01	SSAL5-03 SA167 SA72 SA70 SA123 SA179	≥0.66	Eastern cutline: toe of AP-5 pond berm

Excavation Area Name	Contaminated Sampling Location	Adjacent Sampling Locations	Depth fbgs	Exceptions
RZ-D-30 (C-4)	RSAM7	SSAM7-02 SSAL7-03 RSAL7 SSAM7-01	1	Southern cutline: RZ-E cutline NDEP currently does not approve exclusion of the roadway from excavation.
RZ-D-31 (C-4)	SSAM7-02	RSAM6 RSAM7 SSAM7-01	0.33	Southern cutline: RZ-E cutline NDEP currently does not approve exclusion of the roadway from excavation.