

STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Jim Gibbons, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

January 28, 2010

Matt Paque
Tronox LLC
3301 NW 150th
Oklahoma City, OK 73134

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection (NDEP) Response to:
Health Risk Assessment Work Plan
Dated: January 6, 2010

Dear Mr. Paque,


The NDEP has received and reviewed TRX's above-identified Deliverable and provides comments in Attachment A. A revised Deliverable should be submitted based on the comments found in Attachment A. In the interest of expediency NDEP suggests the following path forward:

1. TRX provides a draft red-line strike-out (RLSO) of the Deliverable to the NDEP **by February 19, 2010**.
2. NDEP and TRX meet (in-person) to review the RLSO and insure that the NDEP's comments have been adequately addressed. The output of this meeting should be concurrence by all parties that the revised Deliverable is acceptable. This meeting should occur **by February 26, 2010** (provided a mutually agreeable date can be found).
3. Submittal of the finalized Deliverable (including the RLSO from the meeting described in #2) **by March 10, 2009**.

Please advise if this schedule is amenable to TRX and provides a reasonable approach to finalization of this Deliverable **by February 5, 2009**. Please contact the undersigned with any questions at sharbour@ndep.nv.gov or (702) 486-2850 extension 240.



Sincerely,



Shannon Harbour, P.E.
Staff Engineer III
Bureau of Corrective Actions
Special Projects Branch
NDEP-Las Vegas Office
Fax: 702-486-5733

SH:bar:sh

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Attachment A

1. General comment, the Deliverable should include a site location figure(s).
2. Page 3, Section 2.2 title. The word "Level" can be deleted as these are simply risk goals.
3. Page 4, Item 6. Please describe how dioxins/furans will be evaluated in the risk assessment. The question is asked because the NDEP prefers the approach of presenting the dioxin/furan (TEQ) risks before reverting to the ATSDR target concentration. Please note that this comment applies to several other places in the Deliverable.
4. Page 6, 1st partial paragraph, last sentence. The term "sale Parcels" is used here, but has not been defined in that way above. The term "sale" should be associated with the Parcels above, or should be deleted.
5. Page 7, Section 3.1.1.2. It is the belief of the NDEP that a trespasser scenario should also be included. If it is the belief of TRX that this scenario is dominated by other scenarios and not important to quantitate then TRX must present calculations to justify this. It is the belief of the NDEP that it is more efficient to simply include the scenario.
6. Page 8, Indoor commercial workers. Please explain why ingestion is included and dermal is not. In addition, please explain why inhalation is included for VOCs, but not for dust.
7. Page 8, Outdoor commercial workers. Delete ending parenthesis from bullet title.
8. Page 8, footnote, this footnote regarding radon is associated with the section on outdoor commercial/industrial workers, but it is also relevant to the indoor scenario. Please clarify.
9. Page 9, second line from the top – "...quantitatively evaluated **for the outdoor scenario** only if indoor air modeling concentrations...". To be clear, please add "for the outdoor scenario" as shown or clarify what is intended.
10. Page 9, Section 3.1.2, 2nd paragraph, 3rd paragraph. The paragraph is about data usability (DU), which does not have anything to do with the quantity of data. Delete "and quantity" from this sentence. Assessing the quantity of data is more to do with data quality objectives (DQOs) and data quality assessment (DQA).
11. Page 9, Section 3.1.2. NDEP has issued guidance on DU. The guidance should be references, and a sentence should be inserted about the need to do some exploratory data analysis to support the DU (per the NDEP guidance).
12. Page 10, Section 3.2, 1st sentence. This sentence needs elaboration. It seems that, in practice, chemicals of potential concern (COPCs) will be chosen for decision units rather than exposure areas. The exposure areas are small (e.g., 1/2 acre), but the decision units will be much larger (e.g., Area I, II, III, or IV or fractions thereof). COPC selection is likely to relate to decision units rather than exposure areas. It would also help to describe decision units on Page 3 where exposure areas are described. There the idea of larger areas is described, but a name for those larger areas is not given (e.g. decision units).
13. Page 10, Section 3.2, 3rd sentence. Change "substances" to "chemicals", and delete "the" in front of COPCs.
14. Page 10, Section 3.2, last sentence. Sentence indicates two procedures, but three are given. Please clarify.
15. Page 11, last 2 sentences. The reference to 0.025 can be removed from here. It is out of context, and is described better on the next page.
16. Page 12, 2nd full paragraph, last sentence. Some explanation of why the Gehan ranking system is needed should be provided. That is, some description of its role for handling non-detects in the Wilcoxon Rank Sum (WRS) and quantile tests is needed.

17. Page 12, Section 3.2.1. Some discussion should be included here about the role of evaluating secular equilibrium for the radionuclides. (please note that acceptable language could be pulled directly from the revised BRC Closure Plan Section 9, please contact the NDEP if TRX needs a copy of this).
18. Page 12, 3rd full paragraph, 2nd sentence. This description of the slippage test is wrong. Replace the description with "This test determines, for each metal and radionuclide, if the set of site concentrations that are greater than the maximum background concentration is greater than would be expected statistically if the site and background distributions are the same".
19. Page 12, 4th full paragraph, 2nd last sentence. The term *p* value should be hyphenated for consistency with common use.
20. Page 14, frequency of detection (FOD) paragraph. This paragraph seems inconsistent with the first bullet on Page 9-10. Some clarification is needed.
21. Page 15, Section 3.2.3, 2nd sentence. Change "(Summary statistics tables) should be prepared" to "will be prepared".
22. Page 16, sentence under 1st equation. Change "1" to "one".
23. Page 16, asbestos paragraphs. It's not clear that this belongs here. This section is about exposure point concentrations for soil. The exposure medium for asbestos is air, in which case, perhaps this material should be moved to the next section in support of the development of the EPC for asbestos in air. Then, the presentation can follow more closely the NDEP guidance on asbestos risk assessment.
24. Page 19, Section 3.3.4. The purpose of this section is not clear. Since incidental contact with groundwater is not considered in the risk assessment, why are upper confidence limits (UCLs) calculated? Please clarify.
25. Page 20, Section 3.4 Methodology for Evaluating Potential Impacts to Groundwater – Please add a reference to the NDEP *Soil to Groundwater Leaching Guidance* (NDEP, January 16, 2010).
26. Page 22, equation. The bioavailability factor BIO is not defined in any of the Tables at the end of this section. For example, the factor ABS is included in the tables.
27. Page 23, exposure concentration and radionuclide intake equations. The concentration term is indexed in these equations (to contaminant and radionuclide). However, no similar indexing is included for the dose equation on the previous page. Please make consistent (either use indexing or do not).
28. Page 24, equation. This is not an equation. Please clarify.
29. Page 24, paragraph under equation list, 3rd sentence. Please reorganize. The parenthetical comment should be in the text, with suitable reorganization.
30. Page 25, 2nd (full) paragraph, 1st sentence. It is not the exposure assumptions that are different between the 2 risk endpoints. Please correct.
31. Page 25, 1st bullet. Delete "generally".
32. Page 28, second full paragraph, please be aware that the original source of the extrapolated inhalation toxicity criteria (the USEPA RSLs) has removed these values so please find another source, evaluate these COPCs qualitatively, or explain why the USEPA RSLs are appropriate.
33. Page 29, 1st (partial) paragraph, last sentence. It is not clear when such a scenario, as described, would occur. Please clarify.
34. Page 30, Section 5.0. Asbestos also needs to be addressed herein. Reference and discussion should be made to Berman and Crump and NDEP guidances.

35. Page 34. A discussion of DQA is needed. This will be used to justify that enough samples have been taken to support the risk-based decisions to be made.
36. Page 34, Section 6.5, 4th and 5th lines. Please change the sentence to say “The risk results will be discussed in the context of the target risk goals specified in Section 2.2.”
37. Page 35, 1st line. Reference is made to presenting both total cancer risk and background risk. This needs clarification. Is the intent that total risk includes background risk? Also note that, Page 11, 1st partial paragraph, states that background metals and radionuclides will not be quantitatively evaluated in the risk assessment. This seems inconsistent with Section 6.5. Please clarify.
38. Table 1. The value for Ut is given as 11.3. In the NDEP asbestos spreadsheets this value is 11.32. Please address this.
39. Table 9.1. The value for wet soil bulk density is given as 1.74. In the NDEP asbestos spreadsheets the value used is 1.83. In this case, a reason for the value of 1.74 is given in table footnote 2 – “Based on data from vicinity investigations”. It would be helpful to provide the data and the data analysis that suggests a value of 1.74 is appropriate. Alternately, please use the NDEP default value.
40. Table 9.1. Table footnote 1 also indicates that mean annual wind speed and number of days per year with some precipitation are based on local data. Again, it would be helpful to provide the data and the data analysis that leads to the values presented or to provide appropriate references. There are other variables in the Tables for which the same comment applies and TRX should check for all instances.
41. Table 2, and others. The NDEP asbestos spreadsheet used the number of days in a year of 365.25. These tables have used a value of 365. Please address this.
42. Table 2. The font should be different for “averaging time, non-carcinogenic for inhalation purposes” – the “t” should be upper case, and the remaining letters should be subscripts.
43. Table 2. Table 9-2 in the BRC Closure Plan includes several parameters that are related to contact with water. TRONOX has not included these parameters. Please clarify why this is not necessary or include the parameters.
44. Tables 2 and 3. Conversion factors are not used in this way in the equations in the text. It would be helpful if all uses of variables in the text and equations exactly match the variables and parameters as specified in these tables.