



STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

Jim Gibbons, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

July 6, 2010

Matt Paque
Tronox LLC
PO BOX 268859
Oklahoma City, OK 73134

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection (NDEP) Response to:
*Technical Memorandum: Evaluation of Soil Leaching to Groundwater Using NDEP
Guidance, Tronox LLC, Henderson, Nevada*
Dated: June 11, 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. Please advise the NDEP by **July 12, 2010** regarding the schedule for this resubmittal. TRX should additionally provide an annotated response-to-comments letter as part of the revised Deliverable.

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-Carson City Office
Fax: 775-687-8335

SH:sh

EC: Jim Najima, Bureau of Corrective Actions, NDEP
Greg Lovato, Bureau of Corrective Actions, NDEP
Mike Skromyda, Tronox LLC
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Keith Bailey, Environmental Answers LLC
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Brian Rakvica, McGinley and Associates
Barry Conaty, Holland & Hart LLP
Brenda Pohlmann, City of Henderson
Mitch Kaplan, U.S. Environmental Protection Agency, Region 9
Ebrahim Juma, Planning Manager, Air Quality and Environmental Management
Joe McGinley, McGinley & Associates
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Teri Copeland, Neptune and Company, Inc.
Kurt Fehling, The Fehling Group, LLC
Joanne Otani

CC: Ebrahim Juma, Planning Manager, Air Quality and Environmental Management
Susan Crowley, C/O Tronox LLC, PO Box 55, Henderson, NV 89009
Lee Erickson, Stauffer Management Company

Attachment A

1. General comment, TRX should note that several issues remain unaddressed in the subject document (e.g., developing a site-specific DAF and statistical comparisons with the background data set not complete). These issues result in a preliminary document that needs significant development. The DAF calculation spreadsheet equations were reviewed and appear to work properly. However, until the infiltration factor is resolved, the NDEP is not necessarily in agreement with the results. Please note that the NDEP has not checked the LSSL calculations at this time.
2. Introduction, page 1, TRX states that soil concentration data are to be compared to background data pursuant to the Soil Screening Guidance (EPA, 1996, p 8). Please specify when the background comparisons will be completed. The document is not considered complete until background comparisons are included.
3. Screening Evaluation Based on NDEP Guidance, page 2, 3rd paragraph, NDEP guidance on evaluating the soil leaching to groundwater pathway indicates that soil concentrations of SRCs are to be evaluated for a DAF of both 1 and 20. TRX only included comparison to DAF 20. TRX should additionally include a comparison to DAF 1.
4. Attachment 2, Input Parameters, NDEP guidance states, "For either industrial or municipal developed areas of the BMI Complex and Common Areas in Henderson Nevada, the Companies must develop a site-specific infiltration rate (I) factor. The infiltration rate (I) factors must be supported via specific references applicable to the site, analytical calculations, or numerical model simulations to show how the factors were developed. *The NDEP must approve the factor(s) prior to use (NDEP, 2009).*" TRX should justify the infiltration rate used in this Deliverable.

In regards to Attachment 2 Input Parameters (NGEM, 6/11/10, pp 2-4 and 2-5), NDEP acknowledges that the conversation cited by NGEM occurred; however, the NDEP indicated that NGEM needed to research this topic and develop a TRX-specific rationale for an infiltration number. Since no rationale was included in this Deliverable, it appears that NGEM used the methods suggested by the NDEP without developing the requested rationale. As such, the NDEP has concerns regarding the infiltration rate calculations as follows:

- a. The NDEP does not agree with NGEM's apparent interpretation of DBS&A's calibration (DBS&A, 2009, p 3). "The developed recharge value of 1.87 in/yr provided slightly better calibration statistics for model layer 1 hydraulic heads than the 0.57 in/yr value." The 1.87 in/yr value as indicated was not an upper limit, but rather a value that provided slightly better calibration statistics for model layer 1.
- b. NDEP did mention that the Upper Los Angeles River Area (ULARA) Watermaster uses 20% of delivered water as the recharge number. NDEP indicated that in using the 20% number in a groundwater model it was found that 10% of delivered water provided fewer calibration problems. The former, ULARA Watermaster information is publically available and as such can be quoted, referring to the 20% factor. The latter (10% factor) was contained in an unpublished consultant's report and as such cannot be properly referenced, and thus, not quoted in the subject document.

The NDEP would like to offer another perspective on infiltration or recharge to the alluvial aquifer on-site. Per Attachment 2 Input Parameters (NGEM, 6/11/10, p 2-5) the total annual

water delivered to Tronox for 2009 was 7.43E+07 gallons. Dividing 7.43E+07 gallons/year by 365 days/year by 1440 minutes/day equals 140 gallons per minute (gpm). The on-site IWF pumps between 60 to 65 gpm on an on-going basis. Using 10% or even 20% of delivered water as a potential recharge number means that from 34 to 48 gpm must come from another source. Alternatively, the leakage from infrastructure may exceed 20%. The implication here is that the infiltration factor may be too low.

TRX should contact NDEP as soon as possible to arrange a conference call to discuss these issues with the infiltration rate.

5. Comparison of Screening Evaluation Results with Site Groundwater Data, pages 3-5, NDEP has the following comments:
 - a. Bulleted list, TRX should support the conclusions and/or representations in this list with isoconcentration plots, data tables, documents, *etc.* as appropriate.
 - b. 4th bullet, please clarify whether any soil samples been collected above the area where the chromium concentrations in groundwater are at maximum value.
6. Removal Activities, Inorganic Chemicals, page 6, NDEP has the following comments:
 - a. 2nd paragraph, please specify what the background concentration is at this point.
 - b. Last paragraph, please provide the rationale for leaving cobalt in place in surface soil at this location.
7. COPCs Attenuating in the Shallow Water-Bearing Zone, Inorganic Chemicals, pages 8-9, NDEP has the following comments:
 - a. 1st full paragraph, 2nd sentence, please provide the data being discussed as the reference to telephone calls alone is insufficient.
 - b. 2nd paragraph, 1st sentence, please explain the occurrence of cobalt north of Warm Springs Rd at the northern extent of the Tronox Site.
8. COPCs Requiring Further Evaluations, Organic Chemicals, Chloroform, page 11, NDEP has the following comments:
 - a. 2nd paragraph, TRX states that “The LSSL is also lower than the LBCL (DAF=20), in part because a lower fraction of organic carbon was used to calculate the LSSL (a default value of 0.002 was used to calculate the LSSL, in accordance with the guidance, while NDEP uses a value of 0.006 to calculate LBCLs).” The NDEP used a f_{oc} value of 0.002 for the LBCL calculation in conformance with the Soil Screening Guidance (EPA, 1996) and Soil Screening Guidance: Technical Background Document (EPA, 1996). Please revise.
 - b. 2nd paragraph and footnote #5, the rationale explained in the footnote for the use of f_{oc} equal to 0.002 is stated as based upon limits of f_{oc} for controlling sorption, which is not an acceptable rationale. The f_{oc} should be determined based on site specific values. Also, please note that soil samples for f_{oc} determination must come from areas not contaminated by organic compounds.
 - c. 2nd paragraph, last sentence, please explain why “A total of twelve soil samples containing chloroform at concentrations exceeding the LSSL are expected to remain in-place after the planned removal actions...”