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

Jim Gibbons, Governor
Allen Biaggi, Director
Leo M. Drozdoff, P.E., Administrator

November 30, 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: Hydrogeologic Groundwater Model Inputs, Tronox LLC, Henderson, Nevada
Dated: October 29, 2010

Dear Mr. Paque,

The NDEP has received and reviewed TRX's above-identified Deliverable and provides comments in Attachment A. These comments should be addressed in the Capture Zone Evaluation Report, which is scheduled be submitted **by December 3, 2010**. TRX should additionally provide an annotated response-to-comments letter as part of the Capture Zone Deliverable.

Please contact the undersigned with any questions at sharbour@ndep.nv.gov or 775-687-9332.

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
William Knight, Bureau of Corrective Actions, NDEP
Brenda Pohlmann, City of Henderson
Stephen Tyahla, U.S. Environmental Protection Agency, Region 9
Jay A. Steinberg, Tronox Henderson Trust
Allan Delorme, ENVIRON

Mark Travers, ENVIRON
Mike Skromyda, Tronox LLC
Michael J. Foster, Tronox LLC
Keith Bailey, Environmental Answers LLC
Susan Crowley, Tronox LLC (Contractor)
Deni Chambers, Northgate Environmental
Brian Rakvica, McGinley and Associates
Joe McGinley, McGinley & Associates
Barry Conaty, Holland & Hart LLP
Ranajit Sahu, BRC
Rick Kellogg, BRC
Lee Farris, BRC
Mark Paris, Landwell
Craig Wilkinson, TIMET
Kirk Stowers, Broadbent & Associates
Victoria Tyson, Tyson Contracting
George Crouse, Syngenta Crop Protection, Inc.
Nick Pogoncheff, PES Environmental
Lee Erickson, Stauffer Management Company
Michael Bellotti, Olin Corporation
Curt Richards, Olin Corporation
Paul Sundberg, Montrose Chemical Corporation
Joe Kelly, Montrose Chemical Corporation of CA
Jeff Gibson, AMPAC
Larry Cummings, AMPAC
Ebrahim Juma , Clean Water Team
Joe Leedy, Clean Water Team
Kathryn Hoffmann, Clean Water Team
Paul Hackenberry, Hackenberry Associates, LLC
Brian Giroux, McGinley and Associates

CC: Susan Crowley, C/O Tronox LLC, PO Box 55, Henderson, NV 89009
Lee Farris, BRC, 875 W. Warm Springs Road, Henderson, NV 89011
Lee Erickson, Stauffer Management Company

Attachment A

1. General comment, the *Hydrogeologic Modeling Work Plan* (dated April 29, 2010) included a task to evaluate density driven groundwater flow effects. Please include the results of this evaluation.
2. Section 2.2, page 3, the stated QA process describes identifying records that have ground surface discrepancies as compared to digital elevation model as well as top-of-casing discrepancies as compared to ground surface elevations. Please include a table summarizing the results of identified data errors and resolutions.
3. Section 2.2, page 4, NDEP provides the following comments:
   a. An ordinary kriging routine is described as used to generate an initial UMCf/Qal contact surface map and "anomalously high or low values" were picked for comparison against well logs to fix errors. Please include a summary of identified errors and resolutions.
   b. Advanced routines are described as used to generate a final UMCf/Qal contact surface map. Please include a discussion on what impacts these methods have on the uncertainty of the final model product.
   c. Differences are described between the final UMCf/Qal contact surface map and that produced by BRC; please describe any differences that are anticipated to propagate substantively different model results.
4. Section 2.3, page 5, please provide a reference for the geophysical survey data.
5. Section 2.5, page 7, the range of hydraulic conductivity for alluvium and Muddy Creek is stated to be bounded by the arithmetic and harmonic mean of the data. Please explain how the data range will be implemented in the model (e.g., stochastic inputs, calibration endpoints, etc.).
6. Section 2.7.1, page 10, please note that AMPAC has recently replaced their injection wells with an injection trench capable of higher rates. The replacement was constructed following the steady state model time period. Additionally, AMPAC is in the process of switching to an ex-situ remediation system with surface discharge, thereby eliminating their current injection well field. These considerations should be noted for any future predictive modeling.
7. Section 2.8, page 10, please note that TIMET is in process of construction of a groundwater barrier wall; this consideration should be noted for any future predictive modeling.
8. Section 3.1, page 11, please discuss how dispersion will be accounted for in capture zone evaluation.
9. Table 1, NDEP provides the following comments:
   a. TRX should note that hydraulic conductivity values used by McGinley & Associates for Athens Road Modeling (2007) have been superseded by revised values (Ed Krish, personal communication with McGinley and Associates).
   b. Please provide a date for the COH Birding Preserve data sent by Brenda Pohlmann. NDEP notes that the reported value is an order-of-magnitude less than that used by DBS&A.
   c. TRX should include discussion on how well HEC-RAS water surface elevation data compare to grid cell elevations and whether there are implications for evapotranspiration extinction implementation.
10. Figure 10, NDEP notes that paleochannels are being simulated using a minimum of 2 grid cells in width (400 feet). Please discuss all factors used to support this geometry.