



# STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Jim Gibbons, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

April 15, 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:  
*Proposal for Demonstration of Perchlorate Treatment within Groundwater Using an  
Injected Permeable Reactive Barrier*  
Dated: February 24, 2010

Dear Mr. Paque,

The NDEP has received and reviewed TRX's above-identified Deliverable and finds that the document is acceptable with comments found in Attachment A noted for the Administrative Record. These comments should be addressed in the resulting Work Plan. Additionally, TRX should provide an annotated response-to-comments letter as an addendum to the Work Plan.

Please contact the undersigned with any questions at [sharbour@ndep.nv.gov](mailto: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:sh

EC: Jim Najima, NDEP, BCA, Carson City  
Greg Lovato, Bureau of Corrective Actions, NDEP, Carson City, NV

CC: Keith Bailey, Environmental Answers LLC, 3229 Persimmon Creek Drive, Edmond, OK 73013  
Susan Crowley, C/O Tronox LLC, PO Box 55, Henderson, NV 89009  
Mike Skromyda, Tronox LLC, PO Box 55, Henderson, NV 89009  
Michael J. Foster, Tronox LLC, P.O. Box 268859, Oklahoma City, OK 73126-8859



Deni Chambers, Northgate Environmental, 300 Frank H. Ogawa Plaza, Suite 510, Oakland, CA 94612

Barry Conaty, Holland & Hart LLP, 975 F Street, N.W. Suite 900, Washington, D.C. 20004

Brenda Pohlmann, City of Henderson, PO Box 95050, Henderson, NV 89009

Mitch Kaplan, U.S. Environmental Protection Agency, Region 9, mail code: WST-5, 75 Hawthorne Street, San Francisco, CA 94105-3901

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Larry Cummings, AMPAC, 3883 Howard Hughes Pkwy, Ste 700, Henderson, NV 89169

Paul Hackenberry, Hackenberry Associates, LLC, 550 W. Plumb Lane B425, Reno, NV 89509

Attachment A

1. General comment, the Work Plan should state that if field data indicate that modifications to the number of injection or monitoring points (or other specifics) included in the original Work Plan are warranted, that these modifications will not be implemented in the field until a revised Work Plan is submitted to NDEP Bureau of Corrective Actions (BCA) and Bureau of Water Pollution Control (BWPC) Underground Injection Control (UIC) for review with concurrence from BCA prior to implementation. Additionally, TRX may want to anticipate some modifications and submit a dynamic work plan to potentially eliminate the need for a revised Work Plan later.
2. General comment, TRX should consider reviewing documentation on the In-Situ Bioremediation System operated by AMPAC for information related to the operation of an in-situ bioremediation system for the destruction of perchlorate, especially those related to metals mobilization.
3. General comment, TRX appears to have chosen a site for the permeable reactive barrier (PRB) based only on the review of *Quarterly Performance Report – Perchlorate Recovery System, April – June 2006*. NDEP notes that this area was previously evaluated employing aquifer tests, natural gradient tracer tests and injected/pump-back tracer tests as discussed in the following two documents:
  - a. *Kerr-McGee, 2001. Seep Area Groundwater Characterization Report.*
  - b. *Errol Montgomery & Associates, 2000, Analysis of Rate of Groundwater Movement Based on Results of Tracer and Hydraulic Tests conducted Between Pittman Lateral and Seep Area.*

Therefore, NDEP recommends that TRX perform a thorough review of previous Tronox reports before preparing a Work Plan for the Injected PRB for regulatory review.

4. General comment, TRX should review and utilize applicable portions of *EPA, 1992, Guide for Conducting Treatability Studies under CERCLA, Office of Solid Waste and Emergency Response, EPA/540/R-92/071a, October* for the scope and technical content of the Work Plan.
5. General comment, TRX should reference appropriate QA/QC procedures and SOPs in the Work Plan.
6. General comment, to expedite processing of the UIC permit, NDEP suggests that TRX include supporting information in the Work Plan as delineated in the UIC General Permit (Long Term) form.
7. Task 3, page 3, NDEP has the following comments:
  - a. TRX should consider impacts of metal mobilization due to pilot site geology and the expected reducing environment from the PRB. At a minimum, arsenic and  $\text{Cr}^{+6}$  should be added to list of metals analytes.
  - b. TRX should note that other Chemicals of Potential Concern (COPCs) may be present in the groundwater that may include SVOCs, pesticides, and metals. Sampling should consider these other COPCs as necessary.
  - c. NDEP has noted that this Task provides a discussion of injection assuming a groundwater velocity of 5 ft/day. Previous work referenced above indicates groundwater velocities on the order of 30 to 45 ft/day. Hydraulic conductivity at the proposed site was estimated at 294 ft/day based on aquifer testing. The proposed

Work Plan should discuss potential impacts to the plan given the previously reported groundwater velocities and hydraulic conductivity.

8. Figure 2, NDEP requests additional explanation documenting the rationale for the proposed locations and number of monitoring wells. The final Work Plan should support monitoring well location with groundwater elevation contours and estimated ranges of groundwater velocities.