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

August 24, 2007

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to: *Phase 2 Sampling and Analysis Plan to Conduct Soil Characterization, Tronox Parcels "A" and "B" Site, Henderson, Nevada* dated August 14, 2007

Dear Ms. Crowley,

The NDEP has received and reviewed TRX's above-identified Phase 2 report and finds that the document is acceptable with the following exceptions noted for the administrative record:

1. Scope of Work, Task 1: Field Implementation, the proposed analyte list should additionally list dioxins/furans.
2. Scope of Work, Task 1: Field Implementation, dioxins/furans are listed on the TRX SRC list dated March 2006.

Please contact the undersigned with any questions at (702) 486-2850 x 240 or sharbour@ndep.nv.gov.

Sincerely,

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

CC: Jim Najima, NDEP, BCA, Carson City
Brian Rakvica, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Mike Richardson, NDEP, BWM, Las Vegas
Keith Bailey, 3229 Persimmon Creek Drive, Edmond, OK 73013
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
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
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Mark Paris, Landwell, 875 West Warm Springs, Henderson, NV 89011
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, CO 80402
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110

Brian Rakvica

From: Brian Rakvica
Sent: Friday, August 24, 2007 1:25 PM
To: 'Keith Bailey'; 'Crowley, Susan'; Lambeth, Jeff; mary.cheung@veoliawaterna.com
Cc: Shannon Harbour; Todd Croft
Subject: RE: Tronox Sand Filter Outage Extension

Keith,

This is acceptable to the NDEP.

Thanks,

Brian

From: Keith Bailey [mailto:okbailey@flash.net]
Sent: Friday, August 24, 2007 1:23 PM
To: Brian Rakvica; 'Crowley, Susan'; Lambeth, Jeff; mary.cheung@veoliawaterna.com
Subject: Tronox Sand Filter Outage Extension

Brian,

As we discussed by phone, work on installing the new UV system has encountered a few unexpected problems. It will be necessary to extend the sand filter outage from the original three days to five days. We will continue to keep turbidity as low as possible during the outage.

Thanks.

Keith

Brian Rakvica

From: Brian Rakvica
Sent: Tuesday, August 21, 2007 11:08 AM
To: 'Keith Bailey'
Cc: Todd Croft; Shannon Harbour; jeffery.lambeth@veoliawaterna.com; mary.cheung@veoliawaterna.com; 'Susan Crowley'
Subject: RE: Tronox UV Modification

Keith,

This sounds good, please keep us apprised of progress.

Thanks,

Brian

From: Keith Bailey [mailto:okbailey@flash.net]
Sent: Tuesday, August 21, 2007 10:57 AM
To: Brian Rakvica
Cc: Todd Croft; Shannon Harbour; jeffery.lambeth@veoliawaterna.com; mary.cheung@veoliawaterna.com; 'Susan Crowley'
Subject: Tronox UV Modification

Brian,

As we discussed on the phone yesterday, in the next two to three weeks Tronox plans to replace the existing Wedeco UV disinfection system on the bioplant with a new system designed by Calgon Carbon Corp. (CCC). The new equipment will be less maintenance intensive and will better handle peak flows. It will be located in the overflow weir box of the existing sand filter. Tronox previously reviewed drawings of the new system with Nadir Sous, who indicated that since the new unit is a direct replacement for the old Wedeco system and will not change the process flow sheet, Tronox needs only to incorporate the CCC operating manual into the bioplant operating manual (including a copy to Nadir).

The new UV installation will be performed in two phases:

1. Installation of the new stainless steel channel and level control weir in the sand filter effluent box, and
2. Installation of electrical components including the control panel and two new UV lamp racks.

During the first phase of installation, Tronox proposes to temporarily remove the sand filter from service for a period of about three days, while the new equipment is being installed. During that time, the existing UV system will remain operational (water bypassing the sand filter will flow through the UV). Water quality will return to the conditions prior to the sand filter installation, slightly cloudy, but in compliance with all numerical conditions in the NPDES permit. We expect the turbidity of the discharge to be about 20 NTU during the installation. As in the past, should the bioplant experience an upset increasing turbidity above 40 NTU, the discharge will be diverted to the GW-11 pond.

The second phase of the installation will require shut-down of the Wedeco UV system to allow extension of conduit and electrical cables to the new UV system. During the several hour tie-in period, when the UV is not available, the bioplant discharge will be routed to the GW-11 pond.

The GW-11 pond currently has capacity to handle about 18 days of full bioplant effluent flow. The UV installation should not significantly decrease this margin of safety.

If you have questions regarding the installation, please contact me at (405) 216-9213 or Susan Crowley at (702) 651-2234.

Keith

TRX

9/20/07

Keith Bailey - 405-216-9213
- for TRONOX

moved UV system previously when sand filter was installed

problem - high ΔP
- bulbs foul
-

exist system Wedeco 40 bulb system

Calgon has a CISO system
add would locate in sand filter overflow weir box

design - already sent to Nadir
- new SS wall into overflow channel

will allow bypass of sand filter for ~ 3 days
slight inc of turbidity
will eventually allow for easier maintenance of UV system

- New weir design as well

- electronics install will follow

- exist UV will not be bypassed

- when UV by [redacted] will go to pad [redacted]

- Nadir is signed off on this re: Keith
  - Keith will follow up

Basic Environmental
COMPANY

Transmittal

To: Brian Rakvica

Date: **8/14/07**

From: Ron Sahu
Director of Environmental Services

Company: NDEP
2030 E. Flamingo Road, Suite 230
Las Vegas, Nevada 89119-0818

VIA:
- ☐ Pick up
- ☐ Courier
- ☐ Overnight Courier
- ☑ Hand Delivered
- ☐ US Mail

The following items are for your:

- ☐ Return
- ☐ Review & Comments
- ☐ Signature
- ☑ Records
- ☐ Review & Approval
- ☐ Information

We are transmitting the following:

1 hard copy, 1 electronic copy of Tronox Parcels A & B Site Plan August 2007

Comments:

Please call Ron Sahu if you have any questions 626-382-0001.

Received by: _____

875 West Warm Springs, Henderson, Nevada 89011 • Phone 702.567.0400 • Fax 702.567.0475

Shannon Harbour

From: Brian Rakvica
Sent: Thursday, August 09, 2007 8:21 AM
To: Shannon Harbour
Subject: FW: Regional Database Issue

Keith is out see below

From: Crowley, Susan [mailto:Susan.Crowley@tronox.com]
Sent: Thursday, August 09, 2007 8:19 AM
To: Brian Rakvica
Cc: David Gratson; Hendricks, Sherron; Gerry,Dave; okbailey@flash.net
Subject: RE: Regional Database Issue

Brian,
Please excuse the delay in getting a response to your note below .... Re the Tronox database – please have Dave contact Sherron Hendricks (in our OKC office) with database structure questions. Her contact information is:

Sherron Hendricks – (405) 775-5482
e-mail – Sherron.hendricks@tronox.com

For database content however – please have Dave contact either Keith or myself. Keith has new contact information:

Keith Bailey
3229 Persimmon Creek Dr
Edmond, OK 73013
Phone: 405-216-9213
e-mail – okbailey@flash.net

He is a continuing important member of the Tronox team – although he can now say he is retired.

Susan Crowley
TRONOX LLC
PO Box 55
Henderson, NV 89009
p 702.651.2234
ef 405.302.4607
email susan.crowley@tronox.com

From: Brian Rakvica [mailto:brakvica@ndep.nv.gov]
Sent: Wednesday, July 25, 2007 6:37 AM
To: Crowley, Susan
Cc: David Gratson
Subject: RE: Regional Database Issue

Susan,

The questions will likely be very specific to the database and will be of a technical nature...is there someone at ERM that Dave can interface with?

Thanks,

Brian

From: Crowley, Susan [mailto:Susan.Crowley@tronox.com]
Sent: Tuesday, July 24, 2007 3:49 PM
To: Brian Rakvica; george.crouse@syngenta.com; npogoncheff@pesenv.com; Brian Waggle; lee.erickson@astrazeneca.com; craig.wilkinson@timet.com; kstowers@broadbentinc.com; victoria@tysoncontracting.com; sahuron@earthlink.net; Mark.Jones@erm.com; pvsmrs@pacbell.net; dgerry@ensr.aecom.com
Cc: Shannon Harbour; Maria Skorska; Chris.Sylvia-Henderson@piona.com; dgratson@neptuneinc.org; pblack@neptuneinc.org; Hendricks, Sherron; Herberich, Jim
Subject: RE: Regional Database Issue

Brian,
Per your request below, please have your contractor contact me for questions. I will coordinate getting a response from those who manage the compliance database and/or the investigative database. If needed, I'll put our folks in direct contact with your contractor. Thanks.

Susan Crowley
TRONOX LLC
PO Box 55
Henderson, NV 89009
p 702.651.2234
ef 405.302.4607
email susan.crowley@tronox.com

From: Brian Rakvica [mailto:brakvica@ndep.nv.gov]
Sent: Tuesday, July 24, 2007 6:14 AM
To: george.crouse@syngenta.com; npogoncheff@pesenv.com; Brian Waggle; lee.erickson@astrazeneca.com; craig.wilkinson@timet.com; kstowers@broadbentinc.com; victoria@tysoncontracting.com; Crowley, Susan; sahuron@earthlink.net; Mark.Jones@erm.com; pvsmrs@pacbell.net; dgerry@ensr.aecom.com
Cc: Shannon Harbour; Maria Skorska; Chris.Sylvia-Henderson@piona.com; dgratson@neptuneinc.org; pblack@neptuneinc.org; Brian Rakvica
Subject: Regional Database Issue

All,

Please provide contact information for a direct point of contact regarding database questions.

NDEP's contractor will give the Companies a chance to answer any questions that will expedite the database work.

If the Comapnies do not respond or are not timely the NDEP will proceed with the work and will bill the Companies to rectify the issue.

A response to this email is required no later than the end of this week, Friday, July 27, 2007 at 5:00 PM Pacific.

thanks,

Brian

If you are not the intended recipient of this e-mail message, any use, distribution or copying of the message is prohibited.
Please let me know immediately by return e-mail if you have received this message by mistake, then delete the e-mail message.
Thank you.

Tronox Confidentiality Notice!
If you are not the intended recipient of this e-mail message, any use, distribution or copying of the message is prohibited.
Please let me know immediately by return e-mail if you have received this message by mistake, then delete the e-mail message.
Thank you.

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

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

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

August 6, 2007

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to: *Phase 2 Sampling and Analysis Plan to Conduct Soil Characterization, Tronox Parcels "A" and "B" Site, Henderson, Nevada* dated July 24, 2007

Dear Ms. Crowley,

The NDEP has received and reviewed TRX's Phase 2 report identified above and provides comments in Attachment A. A revised Phase 2 report should be submitted based on the comments found in Appendix A. Please advise the NDEP regarding the schedule for this resubmittal. TRX should additionally provide an annotated response-to-comments letter as part of the Revised Phase 2 submittal.

Please contact the undersigned with any questions at (702) 486-2850 x 240 or sharbour@ndep.nv.gov.

Sincerely,

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

CC: Jim Najima, NDEP, BCA, Carson City
Brian Rakvica, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Mike Richardson, NDEP, BWM, Las Vegas
Keith Bailey, Tronox, Inc, PO Box 268859, Oklahoma City, Oklahoma 73126-8859
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
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
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Mark Paris, Landwell, 875 West Warm Springs, Henderson, NV 89011
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, CO 80402
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110

Attachment A

1. General comment, TRX should include a discussion on where the judgmental samples were chosen and/or why they were chosen.
2. Scope of Work, Task 1: Field Implementation, the basis for the reduced list of analytes is not defensible.
    a. NDEP has not received TRX's Phase A data; therefore, any eliminations of any site-related chemicals (SRCs) based on the Phase A results or background comparisons to the Phase A results cannot be evaluated at this time. NDEP cannot review statements by TRX that are based upon data that has not been submitted. The discussion that TRX is presenting must be supported by data.
    b. Statements such as "the only detection in that analytical suite…was very low" have no meaning. It would be more appropriate to compare an actual data point to a meaningful metric.
    c. Please note and revise text accordingly that dioxins/furans are listed on the TRX SRC list dated March 2006.
    d. If TRX wants to move forward with the Phase 2 Sampling, then TRX should supply different rationale/evidence for the exclusion of a SRC or include the SRC in the analytical list in Table 1.
3. Scope of Work, Task 1: Field Implementation, 3rd paragraph, page 3, a proposed schedule for additional deeper (greater than 10' below ground surface [fbgs]) should be submitted by TRX for these parcels and BEC should provide a proposed schedule for construction of potential surface improvements. These schedules will help the NDEP determine if the construction schedule will interfere with the characterization schedule by buildings, etc. being constructed and occupied prior to the potential for the characterization data to illustrate unacceptable risk to on site workers and customers.
4. Schedule, 1st paragraph, please verify that the 28 day turn around time is applicable to all analytes (i.e.: asbestos).
5. Table 1, soil samples collected at 5 fbgs are not listed on this table; however, the last paragraph on page 3 states that samples will be collected at 0, 5, and 10 fbgs. This table needs to be modified to match the text.
6. Figures 2 and 3, the NDEP has the following comments:
    a. As noted above, please provide discussion on how each of the judgmental samples was selected.
    b. Grids should be labeled for ease of discussion.
7. Figure 2, the NDEP requests that the 5 partial grids adjacent to the eastern property boundary of the site be sampled.
8. Figure 3, the NDEP requests that the following grids be sampled:
    a. grid adjacent to the east of the grid containing TSB-BR-05
    b. grid adjacent to the east of the grid containing TSB-BR-04
    c. grid adjacent to the south of the grid containing TSB-BJ-04
    d. grid adjacent to the east of the grid containing TSB-BR-01
    e. grid adjacent to the south of the grid described in comment 8.d
    f. grid adjacent to the east of the grid described in comment 8.d
    g. grid adjacent to the east of the grid described in comment 8.e

Shannon Harbour

From: Shannon Harbour
Sent: Friday, August 03, 2007 11:17 AM
To: 'Crowley, Susan'; Brian Rakvica
Cc: Bailey, Keith; Gerry, Dave; Bilodeau, Sally; Bradley, Lisa; Perry, Elizabeth; Kennedy, Robert; Stater, Rick; 'TeriLCopeland@aol.com'; 'Paul Black'; 'Paul Hackenberry'
Subject: RE: Schedule for Tronox ECA Activities

Susan,

The NDEP will make every effort to meet this schedule. Please note that our response time will depend heavily on the quality of the documents and the presentation of the data. If a revised document or addendum is required based on number and/or level of NDEP's comments, the proposed schedule will not be met. Accordingly, TRX should have contingency schedules in mind for potential delays. Our consultants have been notified of TRX's proposed schedule and will also strive to meet this response deadline. Please let me know by what date TRX needs a response from the NDEP to facilitate the proposed start date of November 1, 2007.

Sincerely,
Shannon

Shannon Harbour, P.E.
Bureau of Corrective Actions
NDEP-Las Vegas Office
2030 E Flamingo Rd Suite 230
Las Vegas, NV 89119
702-486-2850 x 240 (work)
702-486-5733 (fax) - note the new fax number

From: Crowley, Susan [mailto:Susan.Crowley@tronox.com]
Sent: Thursday, August 02, 2007 1:02 PM
To: Brian Rakvica; Shannon Harbour
Cc: Bailey, Keith; Gerry, Dave; Bilodeau, Sally; Bradley, Lisa; Perry, Elizabeth; Kennedy, Robert; Stater, Rick
Subject: Schedule for Tronox ECA Activities

Shannon,
In our discussions on July 25th the topic of schedule arose and we recognized the need to forward NDEP our timing expectations for the various tasks leading to the site's Risk Assessment. Please see our schedule that follows. We recognize the NDEP review time for the Phase A Report / Phase B Work Plan is relatively brief – but we are hopeful to be in the field for the Phase B activities in time that the Christmas holidays don't put the work on hold. We expect drilling to take about 6 weeks and this would have us complete right before Christmas (if we are able to get into the field by November 1st). Hence our desire to cover any issues addressed in the Phase A Report / Phase B Work Plan with NDEP even before the doc is transmitted to NDEP in final form. We'll work diligently to improvement any timing possible from our end and still provide NDEP a document worth reviewing.

1. Tronox will submit both the Phase A (including the Phase B work plan) and revised Upgradient reports to NDEP by Oct. 1, 2007
2. If NDEP approves the Phase B work plan, Tronox/ENSR will proceed with Phase B field work starting November 1st.
3. Validated Phase B analytical data will be provided to NDEP by April 15, 2008, and

4. The Phase B report and the Risk Assessment for the site will be submitted to NDEP by July 1, 2008

Please let me know if you have any questions or comments. Thank you.

Susan Crowley
TRONOX LLC
PO Box 55
Henderson, NV 89009
p 702.651.2234
ef 405.302.4607
email susan.crowley@tronox.com

FINAL

Issued
8/3/07

Meeting Minutes

Project:	Tronox (TRX)
Location:	NDEP Conference Room, Las Vegas, NV
Time and Date:	9:00 AM, Wednesday, July 25, 2007
In Attendance:	NDEP – Brian Rakvica, Shannon Harbour
	Teri Copeland (for NDEP)
	Hackenberry Assoc. – Paul Hackenberry (for NDEP)
	Neptune – Paul Black (For NDEP)
	Tronox – Keith Bailey, Susan Crowley
	ENSR (for TRX) – Dave Gerry, Lisa Bradley, Brian Ho, Elizabeth Perry

CC: Jim Najima, Todd Croft

1. The meeting was held to discuss a variety of topics including the Phase A Report and Phase B Work Plan. The purpose of the meeting was to review the evaluation process in a conceptual manner.
2. TRX provided a number of draft tables and "working" figures for discussion purposes during the meeting. TRX did not provide this information in advance of the meeting as requested by the NDEP in order for TRX to facilitate a coordinated explanation of each figure and the logic of how each figure was derived. Therefore, the NDEP did not have an opportunity to review these tables or figures critically. NDEP would prefer to have informational documents that TRX is requesting NDEP to review before meetings with enough lead time to allow an opportunity for critical review. TRX will make efforts to provide such documents in the future.
3. Selection of chemicals, TRX has divided the site-related chemicals (SRCs) analyzed during Phase A ECA into four categories:
    a. Impacts found in soil/groundwater and known uses on-site – Additional characterization recommended
    b. Impacts found in soil/groundwater and no known uses on-site – Additional characterization recommended
    c. Impacts not found in soil/groundwater and known uses on-site – No additional characterization recommended
    d. Impacts not found in soil/groundwater and no known uses on-site – No additional characterization recommended
4. TRX stated that several SRCs were selected for discussion of specific characterization approaches and will be used as templates to review the other SRCs for the Phase A report/Phase B Work Plan.
5. Background Histograms, Comparison of TRX Phase A data; TRX Upgradient data; and COH/TIMET/BRC Background Data in Shallow and Deep Soils, TRX provided histograms for boron, cadmium, lead, manganese, uranium, and radium-226. While TRX averaged data from the surface down to 20 feet for the histograms, NDEP suggested that TRX not include the samples collected at 20 ft bgs in the shallow presentation or the results should be explained in the text of the report. For example, boron in shallow soils looks like there is an impact, perhaps because the 20 ft bgs data are included in a comparison to a shallower data set. ENSR will investigate.

6. Background data, TRX indicated that they were making some preliminary decisions based on the COH background, BRC/TIMET background, and TRX upgradient data sets.
    a. NDEP stated that a background data for deeper soils (e.g.: the Upgradient data) set have not been approved for TRX so any decisions based on a background number would be considered tentative.
    b. Both TRX and NDEP noted that the background dataset for groundwater is not sufficient and does not exist for some water bearing zones.
    c. NDEP noted that it may not be productive for TRX to try and complete comparisons to Upgradient soils data as background. It was suggested that TRX compare to the existing, approved data sets and that the deeper soils issues be discussed as an uncertainty. It appears that there may not be many significant issues if this is completed for the following reasons:
        i. For deeper soils a human health impact is not likely;
        ii. If the deeper soils do not represent a leaching issue then the evaluation may be sufficient;
        iii. It was noted, however, that deeper soils that are elevated relative to background and leaching criteria will be a data gap. It was suggested that TRX present a working hypothesis for this issue and address it once deep background data are available.
    d. TRX stated that additional background groundwater characterization will be proposed in the Phase B work plan.
    e. NDEP noted that it will be difficult to find background sampling locations for groundwater within the vicinity of the facilities. If TRX steps out too far, the water bearing zone is no longer comparable.
7. Specific chemical discussions, TRX provided draft versions of Proposed Phase B Sample Locations and Potential Contaminant Source Area Maps for discussion on location and number of borings/monitoring wells for 13 chemicals. The draft maps illustrated known and/or possible source areas, Phase A sampling points, proposed borings and/or groundwater monitoring wells, flagged data, and detection level and comparison level exceedances.
    a. TRX noted that similar maps would be developed for approximately 60 compounds. The selected additional characterization borings and wells would then be compiled into a "master" map which would form the basis for the Phase B Site Investigation.
    b. For all the draft maps reviewed, TRX will check the legend for errors, mislabeling, or omissions. Numerous errors and omissions were noted during the meeting.
    c. For all the draft maps, TRX will state, as applicable, how background was determined for each chemical (i.e., max concentration in the background data sets or 95%-ile of background data sets, and the source of the data (whether it be truly background approved by NDEP or if it is from the Upgradient data set; etc.).
    d. For all the draft maps, NDEP requested that all wells to be sampled as part of Phase B be labeled in future submittals.
    e. TRX stated that the locations for all proposed borings, monitoring wells, and groundwater sampling points considered potential and known source locations.

f. Boron
   i. Background comparison level of 27 mg/kg was suggested by ENSR for boron. It was noted this is not an approved background number. This number is based on TRX Upgradient data and it was noted that the Upgradient data appears elevated versus background.
   ii. NDEP noted that all sample concentrations are greater than comparison levels calculated using a DAF of 1.

g. Manganese
   i. TRX stated that the presented concentrations in groundwater samples are affected by turbidity. TRX has resampled these wells (following the approved SOP) and is awaiting the results.
   ii. Unit 5 will be shaded as a source area for future submittals.
   iii. Contour lines were based on results of both unfiltered and filtered samples; however, the elevated unfiltered samples were not included in the development of the contour lines. It was also noted that all contours were hand drawn. NDEP suggested that the data used for the contour line should be consistent.

h. Uranium (as a metal)
   i. Uranium is a naturally occurring component in the ore used by TRX but there are no other known sources on site that would explain the localized uranium levels near and north of Unit 6. Additional borings are proposed.
   ii. Background concentration of 4 ppm was chosen by ENSR because it was near the upper end of concentrations in the background data set. NDEP does not agree and it was noted that the BRC/TIMET background value is significantly lower. NDEP also noted that comparison to a max background value is the least conservative comparison that can be made. TRX will work on consistency of background concentration selection.
   iii. M39 will be resampled.

i. Perchlorate
   i. Contour shown was from semi-annual report (Feb 2007).
   ii. A boring will be advanced through the basement of the Unit 4 building. Unit buildings 5 and 6 are still operational and not available for characterization sampling at this time.
   iii. Per the request of NDEP, TRX is currently using 10 mg/kg ($1/10^{th}$ the USEPA Region IX PRG) as the soil screening level for determining nature and extent.
   iv. TRX may review the soil values from TRECO, which has low soil concentration and high groundwater concentrations.
   v. TRX has not created histograms for perchlorate. NDEP stated that background concentrations in soil may be higher that TRX expects because of the PEPCON explosion. TRX stated that they believe that the background concentrations would be less than a risk-based screening level.

j. Chromium VI (CrVI)
   i. TRX stated that known and potential source areas were considered when proposing additional borings for CrVI. The source area containing SA-10

was inadvertently included on the draft map. The source area will be removed from subsequent CrVI maps.

ii. It was noted that the map does not include any of the historical results from the CSM, such as those under the P-Ponds, but that these data were considered during the evaluation and siting of proposed additional sample locations.

iii. TRX will include an additional boring north of the ChemStar plant.

iv. TRX will include additional borings north of SA11 and SA16.

v. NDEP suggested that source areas not selected for characterization should be discussed. This will need to be defensible for the risk assessment.

vi. Pond AP-5, TRX stated that characterization of the soil in this area for perchlorate is not necessary because the perchlorate concentrations in the pond water are extremely high and if the pond were leaking, the perchlorate concentrations in nearby wells would significantly increase. In addition, it was noted that the pond has a leak detection system. NDEP noted that these are all good CSM type reasons that should be discussed in the text of the report.

vii. TRX stated that the Phase A data and the regular groundwater monitoring data are refuting the hypothesis that there is a large on-site CrVI source area remaining in soil.

viii. TRX assumes that total Cr is all CrVI (conservative).

ix. TRX is using a screening level of 1/10 the tap water PRG per request of the NDEP.

k. Chloroform

i. NDEP stated that the recent letter requesting a work plan for vapor intrusion characterization was issued for downgradient properties. On-site soil gas is a separate issue. TRX will include on-site soil-gas sampling in the Phase B Work Plan.

ii. TRX stated that there are no known significant uses of chloroform onsite, this includes plant knowledge. It was noted, however, the area north of Unit Building 4 appears to be an obvious source.

iii. SA-11 exhibited surface detections of chloroform. NDEP wants the extent of this area investigated. NDEP also suggested that TRX review the analytical for this location.

l. Beta-BHC

i. Concentrations only noted in SA14 and M45.

ii. TRX stated that there are no known on-site sources for beta-BHC.

iii. NDEP stated that there is anecdotal evidence that Hardesty Chemical (aka AMECCO), north of Unit 2, could be a possible source area.

iv. NDEP stated that wind-blown dust from the west may also be the source of the beta-BHC.

v. TRX does not believe that the truck washing area is a source area for beta-BHC.

vi. NDEP noted that the Pioneer-Stauffer-Montrose group is currently conducting characterization to the west. This should help identify and off-

site sources of beta-BHC. NDEP encouraged TRX to review the grid sampling data that was collected for surface soils by Syngenta.

m. Ammonia
   i. TRX stated that the ammonia present on-site is likely associated with ammonium perchlorate and would be located in the vicinity of the AP production plant and not the sodium perchlorate production plant.
   ii. TRX noted that nitrate and nitrite may also be observed associated with the ammonium perchlorate production.
   iii. TRX stated that ammonia analyses for 15 of 116 soil samples were rejected but that TRX thinks resampling for those borings is unnecessary based on the associated low groundwater values, which were not rejected, for the groundwater samples associated with these borings (SA09, SA10, and SA14). TRX stated that the rejected data for SA-15 doesn't need resampling because other data already suggest that additional characterization is needed in this area.

n. Hexachlorobenzene (HCB)
   i. TRX stated that there are no known sources of HCB on-site.
   ii. NDEP noted that the SIM data were not posted on the draft map. NDEP requested that the SIM data be posted on the map for report submittal as these are the data that has meaningful detection limits.
   iii. TRX also presented historical data from historic reports. There were some detections of HCB (elevated versus all Phase A data) but not all the samples were labeled for location identification in the CSM. TRX will collect additional samples near the former Koch asphalt plant.
   iv. TRX will move proposed boring in the Beta Ditch near sampling point BDB-03 to near sampling point BDB-04.
   v. In discussing hexachlorobenzene, TRX noted that a high heptachlor value for groundwater at M05A was a lab error. There was interference with the first column during sample analysis by the laboratory; therefore, the lower value from the second column may be more accurate. This was not written up in the lab report but has been confirmed by the lab. TRX will include this in the revised DVSR for this data set.
   vi. TRX noted that HCB analysis may be conducted via the OC Pesticide method in Phase B. NDEP indicated that this is acceptable if the detection limits can be achieved.

o. Radium-226
   i. TRX stated that there is no known source for Ra-226 on-site other than as a decay product of uranium. Paul Black indicated that Phase A soil data may be consistent with secular equilibrium.
   ii. TRX generated a histogram for Ra-226.
   iii. There is no deep background data set for Ra-226.
   iv. A general increase in concentration with depth was observed.
   v. TRX stated that the groundwater samples were unfiltered.
   vi. TRX recommends no additional characterization for Ra-226.
   vii. TRX will recommend a defensible background concentration.

viii. TRX stated that the groundwater concentration exhibited by SA02 was likely an artifact of turbidity.

p. Lead
   i. TRX stated that there are no known source areas for lead on-site. NDEP noted that the truck wash area could be a potential source area and that this source area has anomalous results for a number of compounds.
   ii. TRX stated that only 2 soil samples were above background.
   iii. Teri stated that the concentrations shown on the map should be dismissed by the toxicity criteria.
   iv. TRX will not include lead in the metal analysis for Phase B.
   v. TRX recommends no additional characterization for lead.

q. TPH
   i. NDEP stated that TRX did not have to use 10 ppm (1/10 the soil action level) as a screening level for TPH and could use the 100 ppm action level.
   ii. TRX recommended no additional characterization for TPH.
   iii. SA08 exhibited TPH diesel range of 3,600 ppm in the surface sample. TRX stated that this sample was under pavement and that there were no BTEX or PAH concentrations detected in this sample.
   iv. NDEP and TRX consulted the CSM to discuss the different on-site source areas for TPH and discussed the findings.
      1) LOU 35: Truck dumping (near SA09), TRX stated that 16 samples were collected for SA09 with only 3 detects, all of which were less than 100 ppm. TRX recommended no additional characterization for TPH in this area and NDEP agreed.
      2) LOU 45: Diesel storage tank (north of ChemStar), NDEP noted that 3 historic samples collected in 1999 exhibited TPH concentrations as high as 16,000 ppm. TRX stated that excavation has not occurred in this area. NDEP suggested additional characterization be conducted in this area and may be a possible soil gas sampling location. TRX suggested that 5 borings be advanced in this area – one inside each of the corners of the bermed area and one in the center of the bermed area. TPH, BTEX, and PAHs will be analyzed.
      3) LOU 39: Drum on pallet (northwest for SA11 and M76), TRX stated that the soil in this area was excavated and recommends that no additional sampling be conducted in this area for TPH. The NDEP agreed.
      4) LOU 64: Former asphalt plant (SA10). NDEP pointed out that all historical data and SA10 were collected south of the former asphalt plant. Historically there were tanks and a trailer present. TPH figure will be revised to accurately reflect this area. NDEP suggested that this area be sampled for TPH, BTEX, and PAHs.
      5) LOU 4: Hardesty (former kerosene tank), TRX stated that the tank was removed under the supervision on CCHD and that a closure letter was received. Nothing further proposed.

6) LOU 65: Central building only (near SA03), TRX will remove shading from other buildings associated with this LOU. TRX stated that this area was excavated and recommends no additional characterization. NDEP agreed.
7) LOU 63: former UST, TRX stated that the UST was removed under the supervision of CCHD. TRX recommended no additional characterization. NDEP agreed.
8) LOU 28: hazardous waste storage area, TRX suggested using SA04 to demonstrate that no additional characterization is necessary. NDEP agreed.
9) NV Pick-A Part, TRX will not include this area in the Phase B work plan. This area will be characterized under the Phase II work plan to be submitted by BRC. TRX plans on moving NV Pick-A-Part in 2009-2010 timeframe and remediating that area at that time.
10) NDEP suggested that TRX consider sampling LOUs for soil gas if the historic use or sampling indicate TPH impacts may be present.

r. Cyanide
   i. TRX stated that there are no known source areas for cyanide on-site.
   ii. NDEP noted that State Industries (LOU 62), near SA02 had a release of ~9,000 gallons of liquid waste containing cyanide. TRX stated that many of the soil and groundwater samples were rejected due to poor performance of the analytical equipment. Paul Hackenberry stated that if the pH of the liquid waste were neutral to acidic, the cyanide would be converted to HCN and would no longer be present on-site. Neptune noted that the data were rejected due to low matrix spikes and holding times. NDEP agreed to leave the data as is.

8. Leaching pathway, ENSR stated that the concentration of a chemical in soil would have to be well above the background concentration to have leaching above background levels.
9. Based on the filtered vs. unfiltered sampling results, in which many of the metal samples with high turbidity resulted in high groundwater concentrations, TRX will control turbidity when sampling. TRX stated that not all the wells sampled exhibit increased turbidity when the pumping rate is increased. NDEP noted that this speaks to well construction.
10. Metals: TRX acknowledged that some metals tend to be more mobile in reducing environments such as the NW portion of the facility.
11. NDEP noted that WAPA was almost finished with their characterization.
12. NDEP stated that TRX will need to address each source area for data adequacy in the risk assessment. Historical data may not be used for the risk assessment if not validated. If historical data have lab QA/QC, then TRX can provide this data to NDEP and NDEP will have it validated.
13. NDEP will attempt to provide TRX with a map of Pioneer-Stauffer-Montrose current on-site characterization to prevent duplication of effort. **ACTION ITEM.**
14. NDEP will post the final Borrow Pit Risk Assessment on the NDEP's ftp site. **ACTION ITEM.**
15. TRX stated that arsenic (As) may be a driver in their risk assessment and will schedule a conference call to discuss new groundwater sampling data after validation has been completed. The As data were complicated by turbidity issues. TRX additionally stated that

surface soil samples for As were mostly consistent with background except for a few samples at 17 – 22 mg/kg.

16. TRX stated that they will collect DO, ORP, and pH at time of future Phase B sampling.
17. Phase B laboratory analyses, TRX will provide a list of proposed analytes/suites for Phase B. **ACTION ITEM.**
    a. SVOC, TRX recommends eliminating SVOC analysis for Phase B. HCB will be handled as described below.
    b. HCB, TRX stated that they want to include the analysis for HCB in the OC pesticides analysis. TRX will check with the certification branch for any certification issues. TRX believes that the detection limit should be lower than the screening level. The BDB samples collected by Kleinfelder for the 1993 report were analyzed using method 8081. Teri raised a concern about adding another variable (different analytical methods) into the risk assessment. If certification becomes an issue, TRX may use the method because of the QA/QC that will be required for the DVSR.
    c. Metals, TRX stated that the metal analyses are run on an individual basis so there is no non-reporting issue.
        i. TRX to check again with lab for accuracy of this statement. NDEP stated again that if data are available, they need to be reported.
        ii. Uranium will be run as a metal not as a radionuclide.
    d. Dioxin/furans, TRX recommends eliminating this analysis since all Phase A full method data are below 1 ppb.
    e. PCBs, TRX recommends eliminating this analysis since only one detection was found in Phase A and it was below comparison levels.
    f. Radionuclides, TRX recommends using only gamma spec, if necessary at all.
    g. Asbestos, TRX stated that about half of the EAs will have additional sampling for asbestos, both amphibole and non-amphibole.
        i. All samples will be surface samples using the elutriation method.
        ii. NDEP noted that only known remediation for asbestos is excavation and disposal.
        iii. TRX will collect enough samples to run risk analysis. Neptune suggested TRX may wish to run the calculations backwards to determine how many samples will be necessary for acceptable risk dependent upon the number of detections. TRX was cautioned that analytical sensitivity issues can affect the risk assessment.
18. Teri will supply data usability notes and sample evaluation report to TRX for guidance. **ACTION ITEM**
19. TRX to complete data validation for the May 2007 groundwater resample data by the end of July and will provide the data to NDEP. **ACTION ITEM**
20. Schedule: TRX will notify NDEP of the expected submittal date for the Phase A Report / Phase B Work Plan after internal discussion based upon the comments made at this meeting. **ACTION ITEM.**

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DRAFT

N

750 375 0 750 Feet

TRONOX FACILITY BOUNDARY

BOULDER HIGHWAY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

Groundwater Recharge Trenches

C.O.H. Stormwater

SA01
0.5': 42.2 U
5': 28.9 J
10': 36.2 J
10': GW

SA02
0.5': 35.7 J
10': 451
20': 77.8
30': 655
40': 2270
50': 406
60': 49.0 U
65': GW

SA03
0.5': 1880
0.5D': 1540
10': 10200
20': 6100
30': 974
40': 86.7
41': GW

SA04
0.5': 3140
10': 496
20': 3800
30': 42800
37': GW
40': 73900

SA05
0.5': 14900
10': 112000
20': 66400
30': 19100
37': 375000
37': GW

SA06
0.5': 239
0.5D': 426
10': 2320
20': 3020
30': 5340
35': 54100
36': GW

SA07
0.5': 34300 J
10': 109000 J
10D': 113000 J
20': 12800 J
30': 8690 J
34': 31700 J
36': GW

SA08
0.5': 17500
10': 1500
20': 3300
30': 2690
37': 12100
38': GW

SA09
0.5': 35500
10': 696 J
10D': 408 J
20': 169
30': 2730
40': 133
44': GW

SA10
0.5': 209
10': 227
10D': 226
20': 280
30': 2250
39': GW
40': 656

SA11
0.5': 62500
0.5D': 72400
10': 204000
20': 210000
30': 56900
32': GW

SA12
0.5': 6410
10': 7210
20': 9550
30': 184000
31': GW

SA13
0.5': 192
0.5D': 120
10': 195
20': 184
30': 220
40': 1490
41': GW

SA14
0.5': 1410
10': 220
20': 450
30': 6710
37': GW
40': 500

SA15
0.5': 113000
10': 1210000
10D': 1160000
20': 943000
30': 2330000
35': 204000
37': GW

SA16
0.5': 3720
10': 177
20': 609
30': 1860000
31': GW

SA17
0.5': 366
0.5D': 302
10': 122
20': 792
24': GW
25': 13500

SA18
0.5': 3850 J
0.5D': 1590 J
10': 3500 J
20': 2120 J
30': 53.0 J
32': GW

SA19
0.5': 217000
10': 67700
20': 86100
25': 47200
26': GW

SA20
0.5': 150
0.5D': 158
10': 855
20': 60200
25': 57600
26': GW

SA21
0.5': 1170
10': 44.0 U
20': 44.2 U
20D': 41.8 U
30': 2050
32': GW

SA22
0.5': 4950
10': 2460
20': 60400
21': GW

SA23
0.5': 2760
10': 1280
20': 43200
20D': 34300
27': GW

SA24
0.5': 3840
10': 2690
20': 4080
25': 2160
26': GW

SA25
0.5': 152
10': 30.5 J
15': 42.3 J
17': GW
20': 260 U

SA26
0.5': 21800
0.5D': 19300
10': 323000
10': GW

SA27
0.5': 918
10': 438
20': 16000
22': GW

M01A 1240 J+
M02A 465000
M03 403000 J+
M04 153000
M05A 400 U
M05B 877000 J+ 587000 J+
M06 21800
M07B 61000
M08 1790
M09 6100
M10 3630
M11 32500 J+ 32400 J+
M12 25300
M13 25300
M14A 1740000 J+
M15 4160000
M16 895000 J+
M17 773000 J+
M18 6280000
M19 216
M20 420
M21 4160000
M22 51400 J+ 50700 J+
M23 72500
M24 468
M25 6000 J+

LEGEND

Proposed Phase B Investigation

- Deep Boring To Evaluate Perchlorate In Soil As Potential Source Area
- Groundwater Wells Used For Quarterly Perchlorate Monitoring

Phase A Investigation

- Phase A Groundwater Sample Locations (Location ID and result shown in ug/L)
- Analyte Detected above Comparison Level

SA23
0.5': 7.8
10': 0.5 U
19': GW
20': 53

Boring Number
Result (ug/kg)
Data Qualifier (see below)
Depth to Groundwater
Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

J: Result is an estimated value

J+: Result is an estimated value based high

Perchlorate In Groundwater Iso-Concentration Contour (1mg/L)Dashed where inferred (ENSR 2006).

Potential Perchlorate Source Area (Hatched areas are less well defined) Source: CSM (ENSR 2005)

Perchlorate Comparison Level (DAF=1) = Assume Completely Soluble all Detections will go to Groundwater.

FIGURE NUMBER:	SHEET NUMBER:
1	X

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL PERCHLORATE SOURCE AREAS

SOURCE AREA INVESTIGATION
PHASE B WORKPLAN
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	7/24/07	04020-023-402

ENSR | AECOM

ENSR CORPORATION
1220 AVENIDA ACASO
CAMARILLO, CALIFORNIA 93012
PHONE: (805) 388-3775
FAX: (805) 388-3577
WEB: HTTP://WWW.ENSR.AECOM.COM

DESIGNED BY:	REVISIONS:			
BH	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
TM				
CHECKED BY:				
MF/CS				
APPROVED BY:				
DG				

30 B

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DRAFT

N

750 375 0 750 Feet

TRONOX FACILITY BOUNDARY

BOULDER HIGHWAY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

C.O.H. Stormwater D

PC40 0.20'UJ

SA27
0.5': 0.21 U
10': 0.21 U
20': 0.22 U
22': GW

SA26
0.5': 0.22
0.5D': 0.22 U
10': 0.14 J
10': GW

M95 1940 J

SA25
0.5': 0.15 J
10': 0.11 J
15': 0.14 J
17': GW
20': 0.26 U

MC45 5.1 J

SA22
0.5': 0.25 U
10': 0.11 J
20': 0.23 U
21': GW

SA23
0.5': 0.23 U
10': 0.24 U
20': 0.16 J
20D': 0.18 J
27': GW

M48 1190 J

SA24
0.5': 0.23 U
10': 0.22 U
20': 0.12 J
25': 0.12 J
26': GW

SA21
0.5': 0.21 U
10': 0.22 U
20': 0.22 U
20D': 0.21 U
30': 0.22 U
32': GW

M98 93.2 J

M07B 4.0 UJ

SA20
0.5': 0.22 U
0.5D': 0.25 U
10': 0.24 U
20': 0.72
25': 0.29
26': GW

M100
286 J
287 J

SA16
0.5': 0.12 J
10': 0.20 J
20': 0.22 U
30': 9.3
31': GW

SA18
0.5': 0.22 U
0.5D': 0.21 U
10': 0.22 U
20': 0.21 U
30': 0.22 U
32': GW

M05A 0.20 UJ

M55
10300 J
10400 J

SA19
0.5': 0.22 U
10': 9.0
20': 0.11 J
25': 0.18 J
26': GW

SA17
0.5': 0.58
0.5D': 1.2
10': 0.16 J
20': 0.39
25': 0.19 J
24': GW

M39 4270 J

IAR 4.4

M89 28900 J+

SA14
0.5': 0.22 U
10': 0.23 U
20': 0.25 U
30': 0.32 U
37': GW
40': 0.25 U

SA15
0.5': 0.23 U
10': 0.23 U
10D': 0.22 U
20': 0.22 U
30': 0.27 U
35': 0.28 U
37': GW

SA14 0.20 UJ

SA15 20.3 J

SA12
0.5': 0.22 U
10': 0.13 J
20': 0.22 U
30': 0.26 J
31': GW

M02A 18700 J

M76 2710 J

SA13
0.5': 0.23 U
0.5D': 0.12 J
10': 0.21 U
20': 0.21 U
30': 0.21 U
40': 0.25 U
41': GW

SA09
0.5': 0.24 U
10': 0.24 U
10D': 0.22 U
20': 0.22 U
30': 0.33 U
40': 0.28 U
44': GW

SA09 0.20 UJ

not source area

SA10 37.8

M31A 13300 J

SA08
0.5': 0.21 U
10': 0.21 U
20': 0.21 U
30': 0.22 U
37': 0.27 U
38': GW

SA11
0.5': 2.1
0.5D': 2.1
10': 11.8
20': 3.1
30': 2.1
32': GW

M97 64.6

M11
2540 J+
2200 J+

M29 25.8 J

M12A 11300 J

M13 604 J

M92 14.3 J

SA07
0.5': 0.56
10': 0.21 U
10D': 0.22 U
20': 0.22 U
30': 0.12 J
34': 0.13 J
36': GW

SA10
0.5': 0.22 U
10': 0.22 U
10D': 0.23 U
20': 0.27 U
30': 0.31 U
39': GW
40': 0.30 U

SA06
0.5': 0.22
0.5D': 0.13 J
10': 0.22 U
20': 0.22 U
30': 0.21 U
35': 0.21 J
36': GW

SA03
0.5': 0.11 J
0.5D': 0.21 U
10': 0.21 U
20': 0.22 U
30': 0.26 U
40': 0.29 U
41': GW

SA05
0.5': 2.4
10': 0.23 U
20': 0.24 U
30': 8.4
37': 0.33 U
37': GW

SA02 25.3 J

SA04
0.5': 0.12 J
10': 0.21 U
20': 1.7
30': 0.23 U
37': GW
40': 0.54

SA02
0.5': 0.21 U
10': 0.25 U
20': 0.23 U
30': 0.24 U
40': 0.30 U
50': 0.29 U
60': 0.25 U
65': GW

M120 2.4

SA01
0.5': 0.11 J
5': 0.25 U
10': 0.22 U
10': GW

0.05 mg/L

bold = detect

DAF 1-2
DAF 20-38

LEGEND

Proposed Phase B Investigation

- Deep Boring To Evaluate Hexavalent Chromium In Soil As Potential Source Area
- Groundwater Wells Used For Quarterly Hexavalent Chromium Monitoring

Phase A Investigation

- Phase A Groundwater Sample Locations (Location ID and result shown in ug/L)

Soil Boring Locations

- Analyte Not Detected In Any Sample or Detected At or Below Comparison Level
- Analyte Detected Above Detection Level

SA23
0.5': 7.8
10': 0.5 U
19': GW
20': 53

Boring Number
Result (mg/kg)
Data Qualifier (see below)
Depth to Groundwater
Result Above Detection Level (Bold)
Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

J: Result is an estimated value

UJ: Not detected (number indicates estimated reporting limit)

Hexavalent Chromium In Groundwater Iso-Concentration Contour (0.05 mg/L) Dashed where inferred (ENSR 2006).

Potential Hexavalent Chromium Source Area (Hatched areas are less well defined)
Source: CSM (ENSR 2005)

Hexavalent Chromium comparison level is equal to background level which is the detection level.

FIGURE NUMBER:	SHEET NUMBER:
2	X

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL HEXAVALENT CHROMIUM SOURCE AREAS
SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	7/24/07	04020-023-402

ENSR | AECOM
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WEB: HTTP://WWW.ENSR.AECOM.COM

DESIGNED BY:	REVISIONS:			
X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
X				
CHECKED BY:				
X				
APPROVED BY:				
X				

13 B

J:\TronoxGIS\mxd\402-SourceAreaPhaseA\phbwp\chloroform-11X17.mxd

DRAFT

N

750 375 0 750

Feet

TRONOX FACILITY BOUNDARY

BOULDER HIGHWAY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

AP-6 Pond

AP-1 AP-3 Pond

C.O.H. Stormwater Dra

PC40 4.0 J

SA27 0.5': 5.2 U 10': 5.3 U 20': 5.5 U 22': GW

SA25 0.5': 5.6 U 10': 5.7 U 15': 5.4 U 17': GW 20': 16

SA26 0.5': 5.4 U 0.5D': 5.5 U 10': 5.6 U 10': GW

M95 350 J+

MC45 3.0 J

SA22 0.5': 6.3 U 10': 5.5 U 20': 0.31 J 21': GW

SA23 0.5': 5.8 U 10': 7.8 20': 6.0 U 20D': 5.8 U 27': GW

M48 99 J

SA24 0.5': 5.8 U 10': 5.4 U 20': 1.4 J 25': 3.2 J 26': GW

SA21 0.5': 5.2 U 10': 5.5 U 20': 5.5 U 20D': 5.2 U 30': 5.6 U 32': GW

M07B 2.3 J

M98 810 J+

M100 36 38

SA20 0.5': 0.52 J 0.5D': 6.2 U 10': 0.50 J 20': 0.90 J 25': 0.67 J 26': GW

SA18 0.5': 5.5 U 0.5D': 5.3 U 10': 5.4 U 20': 0.28 J 30': 5.5 U 32': GW

M05A 5.0 U

M55 690 660 J+

SA17 0.5': 5.9 U 0.5D': 5.8 U 10': 5.7 U 20': 5.3 U 24': GW 25': 14

SA19 0.5': 5.5 U 10': 5.5 U 20': 5.5 U 25': 5.8 U 26': GW

IAR 21

M39 820 J+

M84 1700 J+

SA16 0.5': 5.3 U 10': 5.6 U 20': 5.4 U 30': 240 31': GW

SA14 0.5': 0.28 J 10': 0.78 J 20': 12 30': 2300 37': GW 40': 6800

SA14 19000

SA15 41

SA12 0.5': 5.6 U 10': 0.31 J 20': 0.46 J 30': 56 31': GW

M76 290 J+

M02A 1300 J+

SA15 0.5': 2.8 J 10': 0.59 J 10D': 0.54 J 20': 0.35 J 30': 8.3 35': 4.9 J 37': GW

SA09 20000

SA13 0.5': 5.8 U 0.5D': 5.5 UJ 10': 5.2 UJ 20': 5.3 UJ 30': 0.32 J 40': 4.2 J 41': GW

SA09 0.5': 0.18 J 10': 2.0 J 10D': 2.0 J 20': 7.3 30': 1900 40': 5400 44': GW

SA10 300

M31A 930 J+

SA08 0.5': 5.3 UJ 10': 5.3 U 20': 5.2 U 30': 5.5 U 37': 6.8 U 38': GW

M97 12

M11 130 130

M29 4.1 J

SA10 0.5': 1.9 J 10': 1.2 J 10D': 0.92 J 20': 43 30': 170 39': GW 40': 93

M92 30

M12A 1600 J+

M13 40

SA07 0.5': 5.3 U 10': 0.40 J 10D': 0.51 J 20': 1.5 J 30': 1.9 J 34': 20 36': GW

SA11 0.5': 150 0.5D': 130 10': 14 20': 48 30': 17 32': GW

SA06 0.5': 5.3 U 0.5D': 5.8 U 10': 0.50 J 20': 5.4 U 30': 5.3 U 35': 28 36': GW

SA03 0.5': 5.3 U 0.5D': 5.3 U 10': 5.3 U 20': 5.5 U 30': 1.0 J 40': 3.9 J 41': GW

SA04 0.5': 5.5 U 10': 5.3 U 20': 5.5 U 30': 5.7 U 37': GW 40': 5.3 U

SA05 0.5': 6.5 U 10': 5.8 U 20': 0.79 J 30': 19 37': 120 37': GW

SA02 0.5': 5.3 U 10': 6.2 U 20': 5.9 U 30': 5.9 U 40': 7.5 U 50': 7.4 U 60': 6.1 U 65': GW

SA02 5.0 U

M120 1.1 J

SA01 0.5': 5.3 U 5': 6.4 U 10': 5.4 U 10': GW

DAF 20 = 600

DAF 1 = 30

LEGEND

Proposed Phase B Investigation

- Deep Boring To Evaluate Chloroform In Soil As Potential Source Area
- Proposed Phase B Monitoring Well to Evaluate Chloroform in Groundwater
- Proposed New Well

Phase A Investigation

- Phase A Groundwater Sample Locations(Location ID and result shown in ug/L)

Soil Boring Locations

- Analyte Not Detected In Any Sample or Detected At or Below Comparison Level
- Analyte Detected Above Comparison Level

SA23
0.5': 7.8
10': 0.5 U
19': GW
20': 53

Boring Number
Result (ug/kg)
Data Qualifier (see below)
Depth to Groundwater
Result Above Comparison Level (Bold)
Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

J: Result is an estimated value

UJ: Not detected (number indicates estimated reporting limit)

J+: Result is an estimated value based high

Potential Chloroform Source Area (Hatched areas are less well defined)
Source: CSM (ENSR 2005)

Note:
Chloroform SGW Comparison Level (DAF = 1) is 30 ug/kg. Cloroform Direct Contact CL for soil is 47 ug/kg.

FIGURE NUMBER:	SHEET NUMBER:
3	X

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL CHLOROFORM SOURCE AREAS
SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	7/24/07	04020-023-402

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DESIGNED BY:	REVISIONS:			
X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
X				
CHECKED BY:				
X				
APPROVED BY:				
X				

14 B
39 m

DRAFT

N

750 375 0 750 Feet

TRONOX FACILITY BOUNDARY

BOULDER HIGHWAY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

C.O.H. Stormwater Drain

detached plume

7,300 ug/l

WWA

UBC

PC40 2140

SA27
0.5': 7.3 UJ
10': 11.3 UJ
20': 11.7 UJ
22': GW

SA26
0.5': 11.1 UJ
0.5D': 8.9 UJ
10': 6.4 UJ
10': GW

M95 10300 J-

SA25
0.5': 4.0 UJ
10': 5.9 UJ
15': 11.3 UJ
20': 14.0 UJ
17': GW

MC45 1200 J-

SA23
0.5': 4.5 UJ
10': 4.2 UJ
20': 18.3 J-
20D': 17.5 J-
27': GW

M48 4650 J-

SA24
0.5': 4.0 UJ
10': 5.2 UJ
20': 5.6 UJ
25': 5.5 UJ
26': GW

SA22
0.5': 7.1 J-
10': 8.4 J-
20': 23.8 J-
21': GW

M98 3200

M07B 4170

M100 1910 J 1880 J-

SA21
0.5': 3.7 UJ
10': 6.4 UJ
20': 5.9 UJ
20D': 6.5 UJ
30': 6.9 UJ
32': GW

SA20
0.5': 4.7 J
0.5D': 7.7 J
10': 5.5 J-
20': 6.0 J-
25': 9.7 J-
26': GW

SA18
0.5': 4.3 UJ
0.5D': 3.4 UJ
10': 8.7 UJ
20': 6.3 UJ
30': 3.0 UJ
32': GW

M05A 2040 J-

M55 10500 J- 10600 J-

M39 10700 J-

SA19
0.5': 2.8 J-
10': 4.1 J-
20': 10.2 J-
25': 10.0 J
26': GW

SA17
0.5': 8.5 UJ
0.5D': 8.9 UJ
10': 6.9 UJ
20': 6.8 UJ
25': 24.8 UJ
24': GW

SA15
0.5': 3.6 J-
10': 3.5 J-
10D': 2.9 J-
20': 5.9 J-
30': 12.0 J-
35': 16.9 J-
37': GW

IAR 2660

M89 4140 J-

SA16
0.5': 4.2 UJ
10': 4.0 UJ
20': 6.1 UJ
30': 30.4 UJ
31': GW

SA14 1940 J-

SA15 2690 J-

SA14
0.5': 5.5 J-
10': 3.8 J-
20': 5.0 J-
30': 21.2 J-
40': 10.6 J-
37': GW

M76 3910 J-

M02A 3030

SA12
0.5': 9.0 UJ
10': 7.1 UJ
20': 5.7 UJ
30': 38.9 J-
31': GW

SA09
0.5': 5.1 UJ
10': 4.8 UJ
10D': 5.7 UJ
20': 10.1 UJ
30': 25.7 J-
40': 18.0 J-
44': GW

SA09 1250 J-

M31A 7160 J-

SA13
0.5': 3.0 J-
0.5D': 3.8 J-
10': 2.6 J-
20': 3.6 J-
30': 3.3 J-
40': 12.9 J-
41': GW

SA10 1340 J-

SA11
0.5': 14.6 J-
0.5D': 15.4 J-
10': 5.3 UJ
20': 5.7 UJ
30': 19.5 J-
32': GW

M97 4810

M92 1360

M12A 3280 J-

M13 2590

M11 15800 J- 15800 J-

SA08
0.5': 2.5 J-
10': 3.5 J-
20': 6.5 J-
30': 5.6 J-
37': 28.3 J-
38': GW

SA10
0.5': 3.5 UJ
10': 5.8 UJ
10D': 5.4 UJ
20': 7.5 UJ
30': 29.0 J-
40': 20.2 J-
39': GW

M29 2250

SA07
0.5': 48.6 J-
10': 8.7 UJ
10D': 8.2 UJ
20': 9.3 UJ
30': 12.3 UJ
34': 36.8 J-
36': GW

SA03
0.5': 5.7 UJ
0.5D': 5.0 UJ
10': 3.7 UJ
20': 5.8 UJ
30': 25.6 UJ
40': 24.2 UJ
41': GW

SA06
0.5': 5.2 UJ
0.5D': 5.3 UJ
10': 5.6 UJ
20': 6.0 UJ
30': 5.8 UJ
35': 20.8 UJ
36': GW

SA05
0.5': 6.7 UJ
10': 6.0 UJ
20': 7.0 UJ
30': 17.9 UJ
37': 85.7 UJ
37': GW

SA04
0.5': 4.5 UJ
10': 4.7 UJ
20': 5.0 UJ
30': 4.8 UJ
40': 6.9 UJ
37': GW

SA02 2700 J-

SA02
0.5': 3.1 UJ
10': 6.3 UJ
20': 6.4 UJ
30': 20.6 J-
40': 29.6 J-
50': 22.7 J-
60': 11.1 UJ
65': GW

M120 947

SA01
0.5': 3.2 UJ
5': 3.7 UJ
10': 3.7 UJ
10': GW

LEGEND

Proposed Phase B Investigation

- Proposed Boring Location
- Proposed Phase B Monitoring Well to Evaluate Boron in Groundwater

Phase A Investigation

- Phase A Groundwater Sample Locations (Location ID and result shown in mg/L)

Soil Boring Locations

- Analyte Not Detected In Any Sample or Detected At or Below Comparison Level
- Analyte Detected Above Comparison Level

SA23
0.5': 7.8
10': 0.5 U
19': GW
20': 53

- Boring Number
- Result (ug/kg)
- Data Qualifier (see below)
- Depth to Groundwater
- Result Above Comparison Level (Bold)
- Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

J: Result is an estimated value

UJ: Not detected (number indicates estimated reporting limit)

- Boron In Groundwater Iso-Concentration Contour Dashed where inferred 7,300 ug/L = PRG
- Potential Boron Source Area (Hatched areas are less well defined) Source: CSM (ENSR 2005)

FIGURE NUMBER: 4

SHEET NUMBER: X

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL BORON SOURCE AREAS
SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	07/24/07	04020-023-402

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DESIGNED BY:	REVISIONS:			
X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
X				
CHECKED BY:				
X				
APPROVED BY:				
X				

7C
20M

J:\TronoxGIS\mxd\402-SourceAreaPhaseA\phbwp\manganese-11X17.mxd

DRAFT

N

750 375 0 750 Feet

TRONOX FACILITY BOUNDARY

BOULDER HIGHWAY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

C.O.H. Stormwat

50 ug/L

50 ug/L

New Well

New Well

New Well

PC40 873

SA27 0.5': 272 J+ 10': 163 J+ 20': 122 J+ 22': GW

SA25 0.5': 447 J+ 10': 229 J+ 15': 141 J+ 17': GW 20': 463 J+

SA26 0.5': 339 0.5D': 327 10': 187 J 10': GW

M95 68.9 UJ

MC45 553 J-

SA22 0.5': 619 10': 328 20': 139 21': GW

SA23 0.5': 439 10': 323 20': 131 20D': 183 27': GW

M48 20.9 UJ

SA24 0.5': 300 J+ 10': 254 J+ 20': 206 J+ 25': 216 J+ 26': GW

SA21 0.5': 269 J 10': 259 J 20': 452 J 20D': 254 J 30': 138 J 32': GW

M07B 34.2 U

M98 6.8 U

M100 24.4 UJ 24.1 UJ

SA16 0.5': 361 10': 269 20': 92.8 30': 365 31': GW

SA20 0.5': 304 0.5D': 396 10': 334 20': 102 25': 116 26': GW

SA18 0.5': 288 0.5D': 228 10': 314 20': 223 30': 58.8 32': GW

M05A 1130 J-

M55 37.4 UJ 54.6 UJ

SA19 0.5': 275 10': 180 20': 148 25': 154 26': GW

M39 208 UJ

SA17 0.5': 349 0.5D': 373 10': 325 20': 171 24': GW 25': 122

IAR 127

M89 9.3 UJ

SA15 0.5': 568 J+ 10': 239 J+ 10D': 230 J+ 20': 151 J+ 30': 118 J+ 35': 212 J+ 37': GW

SA15 2640 J+ 28.4 J+(S)

SA14 12700 J+ 35.6 J+(S)

M02A 8.5 U

M34

CL04

SA12 0.5': 248 10': 278 20': 131 30': 229 31': GW

M76 13.9 UJ

SA14 0.5': 407 J+ 10': 407 J+ 20': 227 J+ 30': 361 J+ 37': GW 40': 143 J+

SA09 138 J+ 34.2 J+(S)

SA10 5830 J+ 14.3 J+(S)

SA13 0.5': 1680 0.5D': 2320 10': 350 J 20': 434 J 30': 219 J 40': 606 41': GW

M33

M31A 8060 J-

M50

SA09 0.5': 6660 J+ 10': 247 J+ 10D': 314 J+ 20': 219 J+ 30': 357 40': 284 J+ 44': GW

M97 14.6 U

M11 93.5 UJ 96.0 UJ

M12A 592 J-

SA08 0.5': 316 J 10': 349 J 20': 289 J 30': 214 J 37': 111 J 38': GW

M92 35.3 U

M13 496

M29 18.1 J- 108 J- (S)

SA11 0.5': 250 0.5D': 261 10': 298 20': 128 30': 335 32': GW

SA10 0.5': 424 J+ 10': 284 J+ 10D': 435 J+ 20': 235 J+ 30': 759 39': GW 40': 610

SA07 0.5': 1290 10': 278 10D': 262 20': 250 30': 159 34': 171 J 36': GW

M10

SA06 0.5': 249 J 0.5D': 271 J 10': 227 J 20': 301 J 30': 323 J 35': 195 J 36': GW

SA03 0.5': 329 J 0.5D': 369 J 10': 264 J 20': 289 J 30': 119 40': 160 41': GW

SA05 0.5': 483 J 10': 254 J 20': 234 J 30': 131 J 37': 167 J 37': GW

SA04 0.5': 254 J 10': 176 J 20': 295 J 30': 157 J 37': GW 40': 186 J

SA02 4340 J+ 18.7 J+ (S)

SA02 0.5': 325 J+ 10': 305 J+ 20': 404 J+ 30': 185 J+ 40': 250 J+ 50': 196 J+ 60': 160 J+ 65': GW

M120 3.0 J

SA01 0.5': 318 J+ 5': 199 J+ 10': 323 J+ 10': GW

LEGEND

Proposed Phase B Investigation

Deep Boring To Evaluate Manganese In Soil As Potential Source Area

Proposed Phase B Monitoring Well to Evaluate Manganese in Groundwater

Phase A Investigation

Phase A Groundwater Sample Locations (Location ID and result shown in ug/L) (S) represents filtered results

Soil Boring Locations

Analyte Not Detected In Any Sample or Detected At or Below Comparison Level

Analyte Detected Above Comparison Level

SA23
0.5': 7.8
10': 0.5 U
19': GW
20': 53

Boring Number
Result (mg/kg)
Data Qualifier (see below)
Depth to Groundwater
Result Above Background Level (Bold)
Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

J-: Result is an estimated value biased low

J: Result is an estimated value

J+: Result is an estimated value biased high

UJ: Not detected (number indicates estimate reporting limit)

Manganese In Groundwater Iso-Concentration Contour (50ug/L) Dashed where inferred

Potential Manganese Source Area (Hatched areas are less well defined)
Source: CSM (ENSR 2005)

Manganese Comparison Level (DAF=1) = ~~3.26 mg/kg in soil~~
Background is 1100 mg/kg -max

how selected -> if (max or 95%, state. ← less conservative

location of organics (Carbon tetrachloride)

SHEET NUMBER: X

FIGURE NUMBER: 5

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL MANGANESE SOURCE AREAS
SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	07/20/07	04020-023-402

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WEB: HTTP://WWW.ENSR.AECOM.COM

DESIGNED BY:	REVISIONS:			
X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
X				
CHECKED BY:				
X				
APPROVED BY:				
X				

10B
10 m

J:\TronoxGIS\mxd\402-SourceAreaPhaseA\phbwp\bbhc-11X17.mxd

DRAFT

N

750 375 0 750 Feet

TRONOX FACILITY BOUNDARY

BOULDER HIGHWAY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

C.O.H. Stormwater Drain

PC40 0.050 U

SA27 0.5': 0.0018 U 22': GW

SA26 0.5': 0.0041 J 0.5D': 0.0019 UJ 10': GW

SA25 0.5': 0.0044 J+ 17': GW

M95 0.050 U

MC45 10J-

0.10 ug/L

SA22 0.5': 0.0088 J 21': GW

SA23 0.5': 0.0020 U 27': GW

M48 0.050 U

SA21 0.5': 0.0018 U 32': GW

SA24 0.5': 0.0020 U 26': GW

M07B 0.050 U

M98 0.050 U

SA20 0.5': 0.029 J 0.5D': 0.032 26': GW

M100 0.050 U 0.050 U

SA16 0.5': 0.0041 31': GW

SA18 0.5': 0.0019 U 0.5D': 0.0018 U 32': GW

M05A 0.050 U

M55 0.050 U 0.050 U

SA17 0.5': 0.0020 U 0.5D': 0.0026 24': GW

SA19 0.5': 0.0019 U 26': GW

IAR 0.050 U

M39 0.050 U

SA15 0.5': 0.0030 10': 0.052 37': GW

M89 0.050 U

SA12 0.5': 0.0028 31': GW

SA15 0.050 U

SA14 0.5': 0.083 37': GW

SA14 0.14

0.10 ug/L

M02A 0.050 U

M76 0.050 U

SA13 0.5': 0.0020 U 0.5D': 0.0019 U 41': GW

SA09 0.5': 1.3 J+ 44': GW

SA09 0.050 U

M31A 0.050 U

SA08 0.5': 0.018 U 38': GW

SA10 0.050 U

SA11 0.5': 0.030 J+ 0.5D': 0.0019 UJ 32': GW

M97 0.050 U

SA10 0.5': 0.0019 U 39': GW

M11 0.050 U

M12A 0.050 U

M29 0.050 U

M92 0.050 U

M13 0.050 U

SA07 0.5': 0.0018 U 36': GW

SA03 0.5': 0.0018 U 0.5D': 0.0018 U 41': GW

SA06 0.5': 0.0018 U 0.5D': 0.0020 U 36': GW

SA04 0.5': 0.0036 37': GW

SA02 0.050 U

SA05 0.5': 0.0035 37': GW

SA02 0.5': 0.0018 U 20': 0.0020 U 30': 0.0020 U 65': GW

M120 0.050 U

SA01 0.5': 0.0018 U 10': GW

have to show drawing dot

LEGEND

Proposed Phase B Investigation

- Deep Boring To Evaluate Beta-BHC In Soil As Potential Source Area
- Proposed Phase B Monitoring Well to Evaluate Beta-BHC in Groundwater

Phase A Investigation

- Phase A Groundwater Sample Locations (Location ID and result shown in ug/L)

Soil Boring Locations

- Analyte Not Detected In Any Sample or Detected At or Below Comparison Level
- Analyte Detected Above Comparison Level

SA23
0.5': 7.8
10': 0.5 U
19': GW
20': 53

- Boring Number
- Result (mg/kg)
- Data Qualifier (see below)
- Depth to Groundwater
- Result Above Comparison Level (Bold)
- Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

J: Result is an estimated value

UJ: Not detected (number indicates estimated reporting limit)

J+: Result is an estimated quantity and the result may be biased high

J-: Result is an estimated quantity and the result may be biased low

- Beta-BHC In Groundwater Iso-Concentration Contour (0.10 ug/L) Dashed where inferred

Note:
Beta-BHC SGW Comparison Level (DAF=1) is 0.0001 mg/kg.
Beta-BHC Comparison Level for soils Direct Contact is 0.126mg/kg.

SHEET NUMBER:	FIGURE NUMBER:
X	6

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL BETA-BHC SOURCE AREAS
SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	07/24/07	04020-023-402

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WEB: HTTP://WWW.ENSR.AECOM.COM

DESIGNED BY:	REVISIONS:			
X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
X				
CHECKED BY:				
X				
APPROVED BY:				
X				

4B
4M

DRAFT

N

750 375 0 750

Feet

TRONOX FACILITY BOUNDARY

BOULDER HIGHWAY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

C.O.H. Stormwater D

100 ug/L

PC40 57.7

SA27 0.5': 0.85 10': 2.3 20': 1.4 22': GW

SA26 0.5': 0.88 0.5D': 1.0 10': 2.1 10': GW

M95 55.7

SA25 0.5': 0.87 10': 1.5 15': 1.4 20': 2.9 17': GW

MC45 22.7

SA22 0.5': 0.94 10': 2.3 20': 3.9 21': GW

SA21 0.5': 0.86 10': 2.0 20': 2.2 20D': 2.3 30': 3.8 32': GW

M07B 43.6

M98 41.1

SA23 0.5': 0.73 10': 0.94 20': 2.8 20D': 2.8 27': GW

M48 39.4

SA24 0.5': 0.74 10': 1.4 20': 3.0 25': 1.8 26': GW

M100 22.7 22.2

SA20 0.5': 0.81 0.5D': 0.97 10': 0.70 20': 1.4 25': 1.7 26': GW

SA18 0.5': 1.1 0.5D': 0.82 10': 1.8 20': 1.9 30': 1.4 32': GW

M05A 33.6

M55 45.3 45.3

SA19 0.5': 0.85 10': 1.4 20': 2.5 25': 2.3 26': GW

IAR 28.9

M39 103

SA17 0.5': 1.8 0.5D': 2.0 10': 1.6 20': 2.6 25': 3.7 24': GW

SA15 0.5': 0.81 10': 1.3 10D': 1.1 20': 1.6 30': 6.1 35': 2.8 37': GW

M89 27.9

SA16 0.5': 0.74 10': 1.2 20': 1.6 30': 3.4 31': GW

SA14 314 21.3 (S)

SA15 54.4 18.9 J (S)

CL04

SA12 0.5': 0.87 10': 1.7 20': 1.8 30': 4.1 31': GW

M02A 17.2 J

M34

M76 11.1 J

SA14 0.5': 0.93 10': 0.94 20': 1.6 30': 3.3 40': 2.0 37': GW

M33

SA09 36.0 33.7 (S)

SA10 110 6.7 J (S)

M31A 27.1

M31A

SA09 0.5': 0.90 10': 0.98 10D': 1.2 20': 3.7 30': 4.5 40': 2.7 44': GW

SA13 0.5': 0.92 0.5D': 1.0 10': 0.83 20': 1.4 30': 1.4 40': 3.2 41': GW

MW6R

M52

M97 34.6

M29 20.1 24.1 (S)

M11 15.7 15.5

M11

New Well

M12A 42.2

SA10 0.5': 0.71 U 10': 1.3 U 10D': 1.8 U 20': 3.3 30': 3.4 40': 3.1 39': GW

M13 23.3

M92 5.6

SA08 0.5': 0.75 10': 0.93 20': 1.3 30': 2.0 37': 10.2 38': GW

SA11 0.5': 1.0 0.5D': 0.98 10': 1.6 20': 1.4 30': 3.9 32': GW

SA07 0.5': 0.96 10': 0.86 10D': 0.87 20': 1.6 30': 2.1 34': 4.3 36': GW

M10

SA06 0.5': 0.80 0.5D': 1.0 10': 1.0 20': 2.1 30': 1.8 35': 3.7 36': GW

SA03 0.5': 1.3 0.5D': 0.89 10': 0.91 20': 1.4 30': 10.6 40': 3.7 41': GW

SA05 0.5': 1.1 10': 1.1 20': 1.0 30': 2.3 37': 6.1 37': GW

SA02 0.5': 0.68 10': 1.6 20': 1.1 30': 3.5 40': 1.9 50': 1.7 60': 1.2 65': GW

SA02 47.4 9.5 J (S)

SA04 0.5': 0.89 10': 0.85 20': 2.0 30': 0.94 40': 1.6 37': GW

M120 33.7

SA01 0.5': 0.73 5': 0.88 10': 1.4 10': GW

LEGEND

Proposed Phase B Investigation

- Deep Boring To Evaluate Uranium In Soil As Potential Source Area
- Proposed Phase B Monitoring Well to Evaluate Uranium in Groundwater

Phase A Investigation

- Phase A Groundwater Sample Locations (Location ID and result shown in ug/L) (S) represents filtered results

Soil Boring Locations

- Analyte Not Detected In Any Sample or Detected At or Below Background Level
- Analyte Detected Above Comparison Level

SA23
0.5': 7.8
10': 0.5 U
19': GW
20': 53

- Boring Number
- Result (mg/kg)
- Data Qualifier (see below)
- Depth to Groundwater
- Result Above Background Level (Bold)
- Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

Uranium In Groundwater Iso-Concentration Contour (100 ug/L) Dashed where inferred

Note:
Background level = 4.0 mg/kg.

SHEET NUMBER:	FIGURE NUMBER:
X	7

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL URANIUM SOURCE AREAS
SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	7/24/07	04020-023-402

ENSR | AECOM

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DESIGNED BY:	REVISIONS:			
X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
X				
CHECKED BY:				
X				
APPROVED BY:				
X				

3B
9 m

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DRAFT

N

750 375 0 750

Feet

TRONOX FACILITY BOUNDARY

BOULDER HIGHWAY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

Groundwater Recharge Trenches

C.O.H. Stormwa

PC40 NA

M95 NA

MC45 NA

M07B NA

M98 NA

M100 NA

M05A NA

M55 NA

IAR NA

M89 NA

M39 NA

M48 NA

M02A NA

M76 NA

M31A NA

M97 NA

M92 NA

M12A NA

M11 NA

M13 NA

M29 0.50 U, 0.50 U, 0.10 U

M120 0.50 U, 0.50 U, 0.10 U

SA02 0.50 U, 0.50 U, 0.10 U

SA14 NA

SA15 NA

SA09 NA

SA10 NA

SA23 NA

SA19 NA

SA20 NA

SA12 NA

SA13 NA

SA05 NA

SA27
0.5': 4.0 J, 26 U, 0.10 U
10': 27 U, 27 U, 0.11 U
20': 28 U, 28 U, 0.11 U
22': GW

SA26
0.5': 150 J, 110 U, 0.11 U
0.5D': 52 J, 27 U, 0.11 U
10': 28 U, 28 U, 0.11 U
10': GW

SA25
0.5': 26 J+, 5.1 J+, 0.11 U
10': 28 U, 28 U, 0.11 U
15': 27 U, 27 U, 0.11 U
20': 32 U, 32 U, 2.7
17': GW

SA22
0.5': 32 U, 32 U, 0.13 U
10': 28 U, 28 U, 0.11 U
20': 29 U, 29 U, 0.12 U
21': GW

SA24
0.5': 29 U, 29 U, 0.12 U
10': 27 U, 27 U, 0.11 U
20': 27 U, 27 U, 0.11 U
25': 28 U, 28 U, 0.11 U
26': GW

SA21
0.5': 26 U, 26 U, 0.10 U
10': 28 U, 28 U, 0.11 U
20': 28 U, 28 U, 0.11 U
20D': 26 U, 26 U, 0.10 U
30': 28 U, 28 U, 0.11 U
32': GW

SA18
0.5': 27 U, 27 U, 0.11 U
0.5D': 26 U, 26 U, 0.11 U
10': 27 U, 27 U, 0.11 U
20': 27 U, 27 U, 0.11 U
30': 28 U, 28 U, 0.11 U
32': GW

SA17
0.5': 29 U, 29 U, 0.12 U
0.5D': 29 U, 29 U, 0.12 U
10': 28 U, 28 U, 0.11 U
20': 27 U, 27 U, 0.11 U
25': 31 U, 31 U, 0.12 U
24': GW

SA16
0.5': 27 U, 27 U, 0.11 U
10': 28 U, 28 U, 0.11 U
20': 27 U, 27 U, 0.11 U
30': 40 U, 40 U, 0.16 U
31': GW

SA14
0.5': 27 U, 27 U, 0.11 U
10': 28 U, 28 U, 0.11 U
20': 31 U, 31 U, 0.12 U
30': 40 U, 40 U, 0.16 U
40': 31 U, 31 U, 0.89
37': GW

SA15
0.5': 29 U, 29 U, 0.12 U
37': GW

SA11
0.5': 86, 27 U, 0.11 U
0.5D': 28 U, 28 U, 0.11 U
10': 27 U, 27 U, 0.11 U
20': 26 U, 26 U, 0.10 U
30': 41 U, 41 U, 0.16 U
32': GW

SA09
0.5': 30 U, 30 U, 0.12 U
10': 30 U, 30 U, 0.12 U
10D': 28 U, 28 U, 0.11 U
20': 27 U, 27 U, 0.11 U
30': 41 U, 41 U, 0.16 U
40': 35 U, 35 U, 3.2
44': GW

SA08
0.5': 530 U, 3600, 0.13
10': 27 U, 27 U, 0.11 U
20': 26 U, 26 U, 0.10 U
30': 27 U, 27 U, 0.11 U
37': 34 U, 34 U, 0.14 U
38': GW

SA10
0.5': 28 U, 28 U, 0.11 U
10': 28 U, 28 U, 0.11 U
10D': 29 U, 29 U, 0.12 U
20': 34 U, 34 U, 0.13 U
30': 39 U, 39 U, 0.16 U
40': 37 U, 37 U, 0.15 U
39': GW

SA07
0.5': 26, 26 UJ, 0.11 U
10': 26 U, 26 U, 0.11 U
10D': 27 U, 27 U, 0.11 U
20': 27 U, 27 U, 0.11 U
30': 27 U, 27 U, 0.11 U
34': 33 U, 33 U, 0.13 U
36': GW

SA03
0.5': 27 U, 27 U, 0.11 U
0.5D': 27 U, 27 U, 0.11 U
10': 27 U, 27 U, 0.11 U
20': 27 U, 27 U, 0.11 U
30': 32 U, 32 U, 0.13 U
40': 37 U, 37 U, 0.15 U
41': GW

SA06
0.5': 27 U, 27 U, 0.11 U
0.5D': 29 U, 29 U, 0.12 U
10': 27 U, 27 U, 0.11 U
20': 27 U, 27 U, 0.11 U
30': 26 U, 26 U, 0.11 U
35': 37 U, 37 U, 0.15 U
36': GW

SA04
0.5': 43, 27 U, 0.11 U
10': 27 U, 27 U, 0.11 U
20': 27 U, 27 U, 0.11 U
30': 29 U, 29 U, 0.11 U
40': 27 U, 27 U, 0.11 U
37': GW

SA02
0.5': 27 U, 27 U, 0.11 U
10': 31 U, 31 U, 0.12 U
20': 29 U, 29 U, 0.12 U
30': 30 U, 30 U, 0.12 U
40': 37 U, 37 U, 0.15 U
50': 37 U, 37 U, 0.15 U
60': 31 U, 31 U, 0.12 U
65': GW

SA01
0.5': 6.3 J, 26 U, 0.11 U
5': 32 U, 32 U, 0.13 U
10': 27 U, 27 U, 0.11 U
10': GW

historic diesel

no pink

LEGEND

Phase A Investigation

Phase A Groundwater Sample Locations (Location ID and result [Oil, Diesel, Gasoline Range] shown in mg/L)

Soil Boring Locations

Analyte Not Detected In Any Sample or Detected At or Below Comparison Level

Analyte Detected Above Comparison Level

SA23
0.5': 7.8 J, 2.6, 0.51 U
19': GW

- Boring Number
- Results (Oil, Diesel, Gasoline Range in ug/kg)
- Depth to Groundwater
- Data Qualifier (see below)
- Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

J: Result is an estimated value

NA: Not Analyzed for TPH per Phase A Work Plan

Potential TPH Source Area Crosshatched where less well defined. Source: CSM (ENSR 2005)

Comparison Level for soil is 10 mg/kg; NDEP action level for soil is 100 mg/kg.

FIGURE NUMBER:	SHEET NUMBER:
8	X

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL TPH SOURCE AREAS
SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	7/24/07	04020-023-402

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X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
X				
CHECKED BY:				
X				
APPROVED BY:				
X				

DRAFT

N

750 375 0 750

Feet

BOULDER HIGHWAY

TRONOX FACILITY BOUNDARY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

Groundwater Recharge Trenches

C.O.H. Stormwater D

PC40 12.3 U

SA27 0.5': 8.8 10': 6.3 20': 5.2 22': GW

SA26 0.5': 12.6 0.5D': 9.6 10': 7.2 10': GW

M95 12.3 U

SA25 0.5': 9.8 10': 8.4 15': 4.0 20': 11.7 17': GW

MC45 2.8 J

SA21 0.5': 8.2 J 10': 9.1 J 20': 16.4 J 20D': 8.4 J 30': 6.7 J 32': GW

SA23 0.5': 9.2 10': 6.7 20': 4.4 20D': 4.8 27': GW

M48 0.49 U

SA24 0.5': 7.9 10': 7.9 20': 6.9 25': 5.4 26': GW

M07B 9.8 U

M98 9.8 U

SA22 0.5': 8.3 10': 7.7 20': 5.3 21': GW

M100 4.9 U

SA20 0.5': 9.7 0.5D': 11.9 10': 8.2 20': 4.9 25': 5.5 26': GW

SA19 0.5': 9.0 10': 6.8 20': 5.3 25': 5.2 26': GW

M05A 1.3 J

SA18 0.5': 8.2 0.5D': 7.4 10': 8.8 20': 7.6 25': 6.0 32': GW

SA15 0.5': 10.5 10': 7.5 10D': 7.1 20': 6.6 30': 4.3 35': 6.9 37': GW

IAR 9.8 U

SA17 0.5': 28.6 0.5D': 36.3 10': 8.6 20': 5.1 25': 4.3 24': GW

M39 4.9 U

SA16 0.5': 9.1 10': 7.0 20': 4.9 30': 10.9 31': GW

M89 4.9 U

SA14 0.5': 11.0 10': 8.8 20': 6.9 30': 9.6 40': 5.3 37': GW

SA14 627 9.8 U (S)

SA15 94.9 9.8 U (S)

SA12 0.5': 8.1 10': 7.0 20': 5.4 30': 10.5 31': GW

SA11 0.5': 7.0 0.5D': 8.2 10': 8.2 20': 6.0 30': 10.0 32': GW

M76 9.8 U

M02A 12.3 U

SA13 0.5': 9.0 0.5D': 9.5 10': 9.4 20': 10.4 30': 7.4 40': 8.1 41': GW

SA09 9.8 U 9.8 U (S)

SA10 237 9.8 U (S)

M31A 4.9 U

SA09 0.5': 305 10': 7.7 10D': 7.3 20': 7.6 30': 10.2 40': 9.9 44': GW

SA10 0.5': 6.0 10': 8.2 10D': 10.0 20': 5.6 30': 11.3 40': 12.5 39': GW

SA08 0.5': 7.6 10': 8.4 20': 6.9 30': 7.8 37': 4.4 38': GW

M97 9.8 U

SA07 0.5': 32.5 10': 7.4 10D': 7.8 20': 6.7 30': 6.0 34': 4.4 36': GW

M92 0.82 J

M12A 4.9 U

M13 9.8 U

M29 3.4 0.49 U (S)

SA04 0.5': 14.5 10': 6.3 20': 7.0 30': 6.3 40': 6.3 37': GW

SA03 0.5': 12.4 0.5D': 12.1 10': 8.0 20': 7.7 30': 4.6 40': 8.3 41': GW

SA06 0.5': 7.1 0.5D': 11.5 10': 7.6 20': 8.1 30': 7.4 35': 8.3 36': GW

SA05 0.5': 24.2 10': 6.2 20': 5.5 30': 5.6 37': 6.6 37': GW

SA02 0.5': 112 10': 7.0 20': 6.8 30': 5.4 40': 10.7 50': 9.0 60': 6.8 65': GW

SA02 135 9.8 U (S)

SA01 0.5': 12.8 5': 6.4 10': 5.6 10': GW

M120 0.49 U

LEGEND

Proposed Phase B Investigation

▲ Deep Boring To Evaluate Lead In Soil As Potential Source Area

Phase A Investigation

● Phase A Groundwater Sample Locations (Location ID and result shown in ug/L) (S) represents filtered results

Soil Boring Locations

⊙ Analyte Not Detected In Any Sample or Detected At or Below Comparison Level

⊙ Analyte Detected Above Background Level

SA23
0.5': 7.8
10': 0.5 U
19': GW
20': 53

- Boring Number
- Result (ug/kg)
- Data Qualifier (see below)
- Depth to Groundwater
- Result Above Background Level (Bold)
- Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

Potential Lead Source Area (Hatched areas are less well defined)
Source: CSM (ENSR 2005)

Note:
Lead background level = 35 mg/kg.

SHEET NUMBER:	FIGURE NUMBER:
X	6

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL LEAD SOURCE AREAS
SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	7/22/07	04020-023-042

ENSR | AECOM

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DESIGNED BY:	REVISIONS:			
X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
X				
CHECKED BY:				
X				
APPROVED BY:				
X				

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DRAFT

N

750 375 0 750 Feet

TRONOX FACILITY BOUNDARY

BOULDER HIGHWAY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

C.O.H. Stormw

PC40 10 U

SA27
0.5': 350 U
10': 350 U
20': 370 U
22': GW

SA25
0.5': 370 U
10': 370 U
15': 360 U
17': GW
20': 430 U

SA26
0.5': 360 U
0.5D': 360 U
10': 370 U
10': GW

M95 10 U

MC45 10 U

SA22
0.5': 420 U
10': 370 U
20': 380 U
21': GW

SA23
0.5': 380 U
10': 400 U
20': 400 U
20D': 380 U
27': GW

M48 10 U

SA24
0.5': 380 U
10': 360 U
20': 350 U
25': 370 U
26': GW

SA21
0.5': 340 U
10': 360 U
20': 360 U
20D': 340 U
30': 370 U
32': GW

M07B 10 U

M98 10 U

SA20
0.5': 370 U
0.5D': 410 U
10': 390 U
20': 350 U
25': 390 U
26': GW

M100 10 UJ 10 U

SA16
0.5': 350 U
10': 370 U
20': 360 U
30': 530 U
31': GW

SA18
0.5': 360 U
0.5D': 350 U
10': 360 U
20': 350 U
30': 360 U
32': GW

M05A 10 U

SA19
0.5': 360 U
10': 360 U
20': 360 U
25': 380 U
26': GW

M55 10 U 10 U

IAR 10 U

M39 10 U

SA17
0.5': 61 J
0.5D': 45 J
10': 57 J
20': 350 U
24': GW
25': 410 U

SA15
0.5': 310 J
10': 390 U
10D': 160 J
20': 360 U
30': 450 U
35': 450 U
37': GW

M89 10 U

BDB-03 1.0' - ND

BDB-04 1.0' - 6.8 mg/kg

BDB-05 1.0' - ND

SA14
0.5': 73 J
10': 370 U
20': 410 U
30': 530 U
37': GW
40': 410 U

SA14 10 U

SA15 10 U

SA12
0.5': 370 U
10': 350 U
20': 360 U
30': 530 U
31': GW

M02A 10 U

M76 10 U

BDB-02
1.5' - 0.54 mg/kg
2.5' - 6.4 mg/kg
5.0' - ND

SA09
0.5': 400 U
10': 390 U
10D': 370 U
20': 360 U
30': 540 U
40': 460 U
44': GW

SA09 10 U

BG-1
0.5' - 1.2 mg/kg

SA10 10 U

TS-1
1.5' - 1.7 mg/kg

Pole asphalt plant

M31A 10 U

SA13
0.5': 380 U
0.5D': 370 U
10': 340 U
20': 350 U
30': 350 U
40': 420 U
41': GW

SA11
0.5': 960
0.5D': 380 U
10': 350 U
20': 350 U
30': 540 U
32': GW

M97 10 U

M11 10 U

M12A 10 U

M29 10 U

SA08
0.5': 350 U
10': 350 U
20': 350 U
30': 360 U
37': 450 U
38': GW

SA10
0.5': 370 U
10': 360 U
10D': 380 U
20': 440 U
30': 510 U
39': GW
40': 490 U

M92 10 U

M13 10 U

SA03
0.5': 350 U
0.5D': 350 U
10': 350 U
20': 360 U
30': 430 U
40': 490 U
41': GW

SA07
0.5': 350 U
10': 350 U
10D': 360 U
20': 360 U
30': 350 U
34': 430 U
36': GW

SA06
0.5': 350 U
0.5D': 380 U
10': 360 U
20': 360 U
30': 350 U
35': 490 U
36': GW

SA04
0.5': 360 U
10': 350 U
20': 360 U
30': 380 U
37': GW
40': 350 U

SA05
0.5': 430 U
10': 380 U
20': 390 U
30': 360 U
37': 550 U
37': GW

SA02 10 UJ

SA02
0.5': 350 U
10': 410 U
20': 390 U
30': 390 U
40': 490 U
50': 490 U
60': 400 U
65': GW

M120 10 U

SA01
0.5': 350 U
5': 420 U
10': 360 U
10': GW

* no SEM data posted

Compare level?

LEGEND

- Historical Assessment Soil Sample Result in mg/kg

Phase A Investigation

- Phase A Groundwater Sample Locations(Location ID and result shown in ug/L)

Soil Boring Locations

- Analyte Not Detected In Any Sample or Detected At or Below Comparison Level
- Analyte Detected Above Comparison Level

SA23
0.5': 7.8
10': 0.5 U
19': GW
20': 53

- Boring Number
- Result (ug/kg)
- Data Qualifier (see below)
- Depth to Groundwater
- Result Above Comparison Level (Bold)
- Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

J: Result is an estimated value

UJ: Not detected (number indicates estimated reporting limit)

Potential Hexchlorobenzene Source Area (Hatched areas are less well defined)

Hexachlorobenzene comparison level (DAF-1) = 100ug/kg

SHEET NUMBER:	FIGURE NUMBER:
X	10

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL HEXACHLOROBENZENE SOURCE AREAS

SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	7/24/07	04020-023-402

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DESIGNED BY:	REVISIONS:			
X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
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CHECKED BY:				
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APPROVED BY:				
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7

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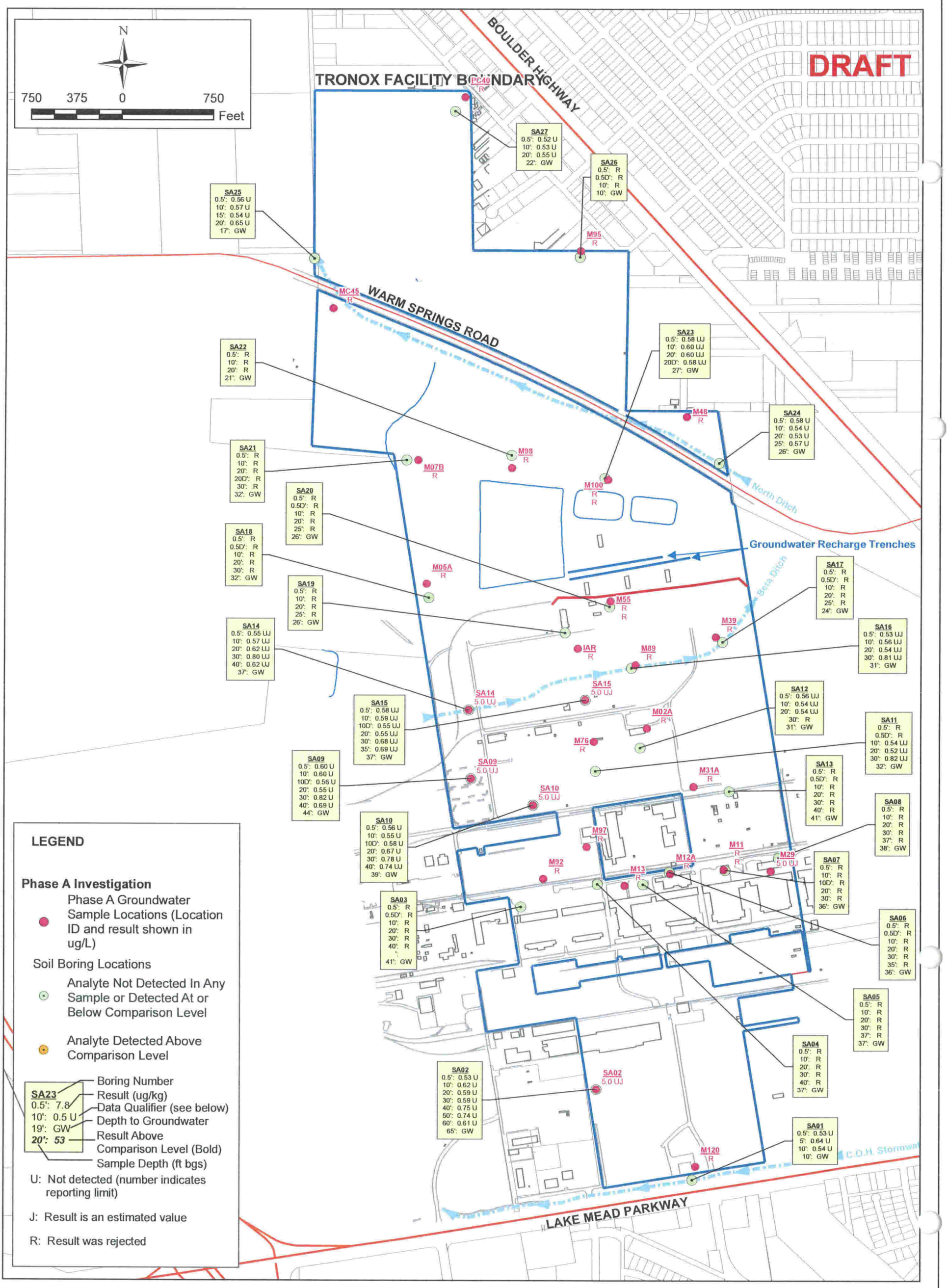

FIGURE NUMBER:	SHEET NUMBER:
11	X

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL CYANIDE SOURCE AREAS

SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
X	X	X

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X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
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CHECKED BY:				
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APPROVED BY:				
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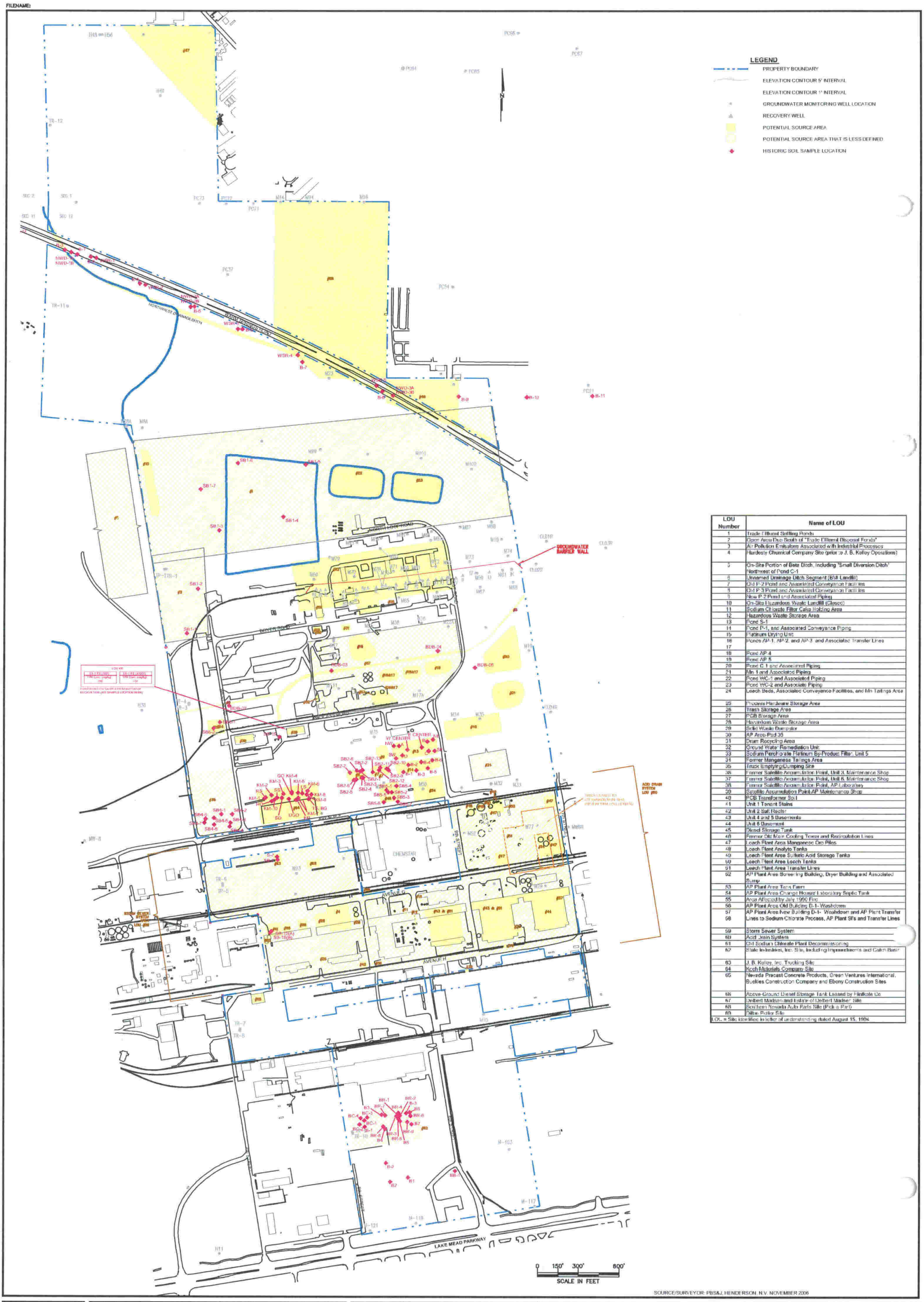
FILENAME:



LOU Number	Name of LOU
1	Trade Effluent Settling Ponds
2	Open Area Due South of "Trade Effluent Disposal Ponds"
3	Air Pollution Emissions Associated with Industrial Processes
4	Hardesty Chemical Company Site (prior to J. B. Kelley Operations)
5	On-Site Portion of Bate Ditch, Including "Small Diversion Ditch" Northwest of Pond C-1
6	Unnamed Drainage Ditch Segment (BMI Landfill)
7	Old P-2 Pond and Associated Conveyance Facilities
8	Old P-3 Pond and Associated Conveyance Facilities
9	New P-2 Pond and Associated Piping
10	On-Site Hazardous Waste Landfill (Closed)
11	Sodium Chloride Filter Cake Holding Area
12	Hazardous Waste Storage Area
13	Pond S-1
14	Pond P-1, and Associated Conveyance Piping
15	Platinum Drying Unit
16	Ponds AP-1, AP-2, and AP-3 and Associated Transfer Lines
17	
18	Pond AP-4
19	Pond AP-5
20	Pond C-1 and Associated Piping
21	Mn-1 and Associated Piping
22	Pond WC-1 and Associated Piping
23	Pond WC-2 and Associate Piping
24	Leach Beds, Associated Conveyance Facilities, and Mn Tailings Area
25	Process Hardware Storage Area
26	Trash Storage Area
27	PCB Storage Area
28	Hazardous Waste Storage Area
29	Solid Waste Dumpster
30	AP Area-Pad 35
31	Drum Recycling Area
32	Ground Water Remediation Unit
33	Sodium Perchlorate Platinum By-Product Filter, Unit 5
34	Former Manganese Tailings Area
35	Truck Emptying/Dumping Site
36	Former Satellite Accumulation Point, Unit 3, Maintenance Shop
37	Former Satellite Accumulation Point, Unit 5, Maintenance Shop
38	Former Satellite Accumulation Point, AP Laboratory
39	Satellite Accumulation Point-AP Maintenance Shop
40	PCB Transformer Spill
41	Unit 1 Tenant Stains
42	Unit 2 Salt Reals
43	Unit 4 and 5 Basements
44	Unit 6 Basement
45	Diesel Storage Tank
46	Former Old Main Cooling Tower and Recirculation Lines
47	Leach Plant Area Manganese Ore Piles
48	Leach Plant Analyte Tanks
49	Leach Plant Area Sulfuric Acid Storage Tanks
50	Leach Plant Area Leach Tanks
51	Leach Plant Area Transfer Lines
52	AP Plant Area Screening Building, Dryer Building and Associated Sumps
53	AP Plant Area Tank Farm
54	AP Plant Area Change House/ Laboratory Septic Tank
55	Area Affected by July 1990 Fire
56	AP Plant Area Old Building D-1- Washdown
57	AP Plant Area New Building D-1- Washdown and AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SFs and Transfer Lines
58	
59	Storm Sewer System
60	Acid Drain System
61	Old Sodium Chlorate Plant Decommissioning
62	Slide Industries, Inc. Site, including Impoundments and Catch Basin
63	J. B. Kelley, Inc. Trucking Site
64	Koch Materials Company Site
65	Nevada Precast Concrete Products, Green Ventures International, Buckles Construction Company and Ebony Construction Sites
66	Above-Ground Diesel Storage Tank Leased by Flintkote Co
67	Delbert Madsen and Estate of Delbert Madsen Site
68	Southern Nevada Auto Parts Site (Pick a Part)
69	Dillon Parlor Site

LOU = Site identified in letter of understanding dated August 15, 1994

SOURCE/SURVEYOR: PBS&J, HENDERSON, N.V. NOVEMBER 2006

HISTORIC SAMPLE LOCATIONS

Source Area Investigation
Phase A
Tronox Facility
Henderson, Nevada

SCALE:	DATE:	PROJECT NUMBER:
1" = 300'	7/19/2007	04020-023-402

SHEET NUMBER: 12 PLATE NUMBER: X

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B. Ho	NO.:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
M. Scop				
CHECKED BY:				
S. Bilodeau				
APPROVED BY:				
D. Gerry				

TRONOX

FILENAME:

LOU Number	Name of LOU
1	Trade Effluent Settling Ponds
2	Open Area Due South of Trade Effluent Disposal Ponds
3	Air Pollution Emissions Associated with Industrial Processes
4	Hardesty Chemical Company Site (prior to J. S. Kelley Operations)
5	On-Site Portion of Bets Ditch, Including "Small Diversion Ditch" Northwest of Pond C-1
6	Unnamed Drainage Ditch Segment (BMI Landfill)
7	Old P-2 Pond Area Associated Conveyance Facilities
8	Old P-3 Pond Area Associated Conveyance Facilities
9	New P-2 Pond and Associated Piping
10	On-Site Hazardous Waste Landfill (Closed)
11	Sodium Chlorate Filter Cake Holding Area
12	Hazardous Waste Storage Area
13	Pond S-1
14	Pond P-1, and Associated Conveyance Piping
15	Platinum Drying Unit
16	Ponds AP-1, AP-2, and AP-3, and Associated Transfer Lines
17	
18	Pond AP-4
19	Pond AP-5
20	Pond C-1 and Associated Piping
21	Mn-1 and Associated Piping
22	Pond WC-1 and Associated Piping
23	Pond WC-2 and Associate Piping
24	Leach Beds, Associated Conveyance Facilities, and Mn Tailings Area
25	Process Hardware Storage Area
26	Trash Storage Area
27	PCB Storage Area
28	Hazardous Waste Storage Area
29	Solid Waste Dumpster
30	AP Area Pad 35
31	Drum Recycling Area
32	Ground Water Remediation Unit
33	Sodium Perchlorate Platinum By-Product Filter, Unit 5
34	Former Manganese Tailings Area
35	Truck Emptying/Dumping Site
36	Former Satellite Accumulation Point, Unit 3, Maintenance Shop
37	Former Satellite Accumulation Point, Unit 6, Maintenance Shop
38	Former Satellite Accumulation Point, AP Laboratory
39	Satellite Accumulation Point-AP Maintenance Shop
40	PCB Transformer Spill
41	Unit 1 Tenant Stains
42	Unit 2 Salt Reeler
43	Unit 4 and 5 Basements
44	Unit 6 Basement
45	Diesel Storage Tank
46	Former Old Main Cooling Tower and Recirculation Lines
47	Leach Plant Area Manganese Ore Piles
48	Leach Plant Analyte Tanks
49	Leach Plant Area Sulfuric Acid Storage Tanks
50	Leach Plant Area Leach Tanks
51	Leach Plant Area Transfer Lines
52	AP Plant Area Screening Building, Dryer Building and Associated Sump
53	AP Plant Area Tank Farm
54	AP Plant Area Change House/ Laboratory Septic Tank
55	Area Affected by July 1990 Fire
56	AP Plant Area Old Building D-1 Washdown
57	AP Plant Area New Building D-1 Washdown and AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant Sits and Transfer Lines
58	
59	Storm Sewer System
60	Acid Drain System
61	Old Sodium Chlorate Plant Decommissioning
62	Blue Tetrazolium, Inc. Site, Including Impoundments and Calcn Basin
63	J. S. Kelley, Inc. Trucking Site
64	Koch Materials Company Site
65	Nevada Precast Concrete Products, Green Ventures International, Buckles Construction Company and Ebony Construction Sites
66	Above-Ground Diesel Storage Tank Leased by Flinkote Co.
67	Delbert Madsen and Estate of Delbert Madsen Site
68	Southern Nevada Auto Parts Site (Pick a Part)
69	Dillon Potter Site

LOU = Site identified in letter of understanding dated August 15, 1994

SOURCE/SURVEYOR: PBS&J, HENDERSON, N.V. NOVEMBER 2006

PLATE NUMBER: 13

SHEET NUMBER: X

SOURCE AREA LOCATION MAP

Source Area Investigation
Phase A
Tronox Facility
Henderson, Nevada

SCALE:	DATE:	PROJECT NUMBER:
1" = 300'	7/19/2007	04020-023-402

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DRAWN BY:				
M. Scop				
CHECKED BY:				
S. Bilodeau				
APPROVED BY:				
D. Gerry				

TRONOX

J:\TronoxGIS\mxd\402-SourceAreaPhaseA\phbwp\ammonia-11X17.mxd

DRAFT

N

600 300 0 600 Feet

TRONOX FACILITY BOUNDARY

BOULDER HIGHWAY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

C.O.H. Stormwater D

PC40 50.0 U ug/l

SA27
0.5': 5.2 U
10': 5.3 U
20': 5.5 U
22': GW

SA25
0.5': 5.6 U
10': 5.7 U
15': 5.4 U
20': 6.5 U
17': GW

SA26
0.5': 5.4 UJ
0.5D': 5.5 UJ
10': 5.6 UJ
10': GW

M95 2450 ug/l

MC45 50.0 U ug/l

SA23
0.5': 5.8 UJ
10': 6.0 UJ
20': 6.0 UJ
20D': 5.8 UJ
27': GW

SA22
0.5': 6.3 UJ
10': 5.5 UJ
20': 5.8 UJ
21': GW

M23

M48 942 ug/l

SA24
0.5': 5.8 U
10': 5.4 U
20': 5.3 U
25': 5.7 U
26': GW

M7B 50.0 U ug/l

M98 50.0 U ug/l

M99 M100 3620 ug/l

M101

M100

SA21
0.5': 5.2 UJ
10': 5.5 UJ
20': 5.5 UJ
20D': 5.2 UJ
30': 5.6 UJ
32': GW

SA18
0.5': 5.5 UJ
0.5D': 5.3 UJ
10': 5.4 UJ
20': 5.4 UJ
30': 5.5 UJ
32': GW

M5A 50.0 U ug/l

M83

M69 M55 2630 ug/l M7R

M57A M65

M64

M39 50.0 U ug/l

M25

IAR 507000 ug/l

10 mg/l

M38

M89

SA20
0.5': 5.6 UJ
0.5D': 6.2 UJ
10': 5.9 UJ
20': 5.3 UJ
25': 5.9 UJ
26': GW

SA17
0.5': 5.9 UJ
0.5D': 5.8 UJ
10': 5.7 UJ
20': 5.3 UJ
25': 6.2 UJ
24': GW

SA19
0.5': 5.5 UJ
10': 5.5 UJ
20': 5.5 UJ
25': 5.8 UJ
26': GW

GWSA15 M17A

GWSA14 50.0 U ug/l

SA14
0.5': R
10': R
20': R
30': R
40': R
37': GW

M2A 50.0 U ug/l

M76 50.0 U ug/l

M76

SA16
0.5': 5.3 UJ
10': 5.6 UJ
20': 5.4 UJ
30': 208 J
31': GW

SA12
0.5': 5.6 UJ
10': 5.4 UJ
20': 5.4 UJ
30': 8.1 UJ
31': GW

GWS09 50.0 U ug/l

SA15
~~0.5': 928 J-~~
10': R
10D': 58.5 J-
20': 380 J-
30': 28.0 J-
35': 456 J-
37': GW

GWSA10 50.0 U ug/l

M31A 1270 ug/l

SA13
0.5': 5.8 UJ
0.5D': 5.5 UJ
10': 5.2 UJ
20': 5.3 UJ
30': 5.3 UJ
40': 6.3 UJ
41': GW

SA09
0.5': 1.3 J
10': 6.0 U
10D': 5.6 U
20': R
30': R
40': R
44': GW

M97 50.0 U ug/l

M92 50.0 U ug/l

M12A 50.0 U ug/l

M11 50.0 U ug/l

M13 50.0 U ug/l

M29 79.9 ug/l

SA08
0.5': 5.3 UJ
10': 5.3 UJ
20': 5.2 UJ
30': 5.5 UJ
37': 6.8 UJ
38': GW

SA10
0.5': R
10': R
10D': R
20': R
30': R
40': R
39': GW

SA11
0.5': 5.4 UJ
0.5D': 5.7 UJ
10': 5.4 UJ
20': 5.2 UJ
30': 8.2 UJ
32': GW

SA07
0.5': 5.3 UJ
10': 5.3 UJ
10D': 5.4 UJ
20': 5.4 UJ
30': 5.3 UJ
34': 6.5 UJ
36': GW

SA03
0.5': 5.3 UJ
0.5D': 5.3 UJ
10': 5.3 UJ
20': 5.5 UJ
30': 6.4 UJ
40': 7.4 UJ
41': GW

SA04
0.5': 5.5 UJ
10': 5.3 UJ
20': 5.5 UJ
30': 5.7 UJ
40': 5.3 UJ
37': GW

SA06
0.5': 5.3 UJ
0.5D': 5.8 UJ
10': 5.4 UJ
20': 5.4 UJ
30': 5.3 UJ
35': 7.4 UJ
36': GW

SA05
0.5': 6.5 UJ
10': 5.8 UJ
20': 5.9 UJ
30': 5.4 UJ
37': 8.3 UJ
37': GW

GWSA2 50.0 U ug/l

SA02
0.5': 5.3 U
10': 6.2 U
20': 5.9 U
30': 5.9 U
40': 5.7 J
50': 1.0 J
60': 0.80 J
65': GW

M120 50.0 U ug/l

SA01
0.5': 5.3 U
5': 6.4 U
10': 5.4 U
10': GW

LEGEND

- Proposed Phase B Deep Boring To Evaluate Ammonia In Soil As Potential Source Area
- Proposed Phase B Monitoring Well to Evaluate Ammonia in Groundwater
- Potential Ammonia Source Area (Hatched areas are less well defined.)
- Ammonia In Groundwater Iso-Concentration Contour Dashed where inferred
- Phase A Water Sample Locations (Location ID and result shown in magenta)

Phase A Soil Boring Locations

- Analyte Not Detected In Any Sample or Detected At or Below Comparison Level
- Analyte Detected Above Comparison Level

SA23
0.5': 7.8
10': 0.5 U
19': GW
20': 53

- Boring Number
- Result (mg/kg)
- Data Qualifier (see below)
- Depth to Groundwater
- Result Above Detection Level (Bold)
- Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

J: Result is an estimated value

UJ: Not detected (number indicates estimated reporting limit)

J-: Result is an estimated value (biased low).

FIGURE NUMBER: 14

SHEET NUMBER: X

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL AMMONIA SOURCE AREAS
SOURCE AREA INVESTIGATION
PHASE B WORKPLAN
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	7/17/07	04020-023-402

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X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
X				
CHECKED BY:				
X				
APPROVED BY:				
X				

J:\TronoxGIS\mxd\402-SourceAreaPhaseA\phbwp\ra226-11X17.mxd

DRAFT

N

750 375 0 750

Feet

TRONOX FACILITY BOUNDARY

BOULDER HIGHWAY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

North Ditch

Beta Ditch

C.O.H. Stormwate

SA25
0.5': 1.21
10': 1.19
15': 1.69
17': GW
20': 1.63

SA27
0.5': 0.985
10': 1.23
20': 1.11
22': GW

SA26
0.5': 1.2
0': 1.02
10': 1.33
10': GW

M95
0.57 J

MC40
0.224 J

MC45
2 U

SA22
0.5': 1.01
10': 1.37
20': 2.28
21': GW

SA21
0.5': 1.15
10': 2 U
20': 1.67
20D': 2.01
30': 1.48
32': GW

SA23
0.5': 1.11
10': 1.18
20': 1.73
20D': 1.72
27': GW

M48
0.335 J

SA24
0.5': 0.965
10': 1.08
20': 1.4
25': 1.59
26': GW

M07B
0.457 J

M98
0.43 J

M100
0.195 J
2 U

SA20
0.5': 1
0.5D': 0.863
10': 1.31
20': 1.47
25': 1.52
26': GW

SA16
0.5': 1.16
10': 1.07
20': 1.85
30': 1.71
31': GW

SA18
0.5': 1.19
0.5D': 1.06
10': 1.25
20': 1.8
30': 2.47
32': GW

M05A
0.546 J

M55
0.239 J
0.247 J

SA17
0.5': 1.12
0': 1.12
10': 1.2
20': 1.8
24': GW
25': 1.81

SA19
0.5': 1.16
10': 1.43
20': 1.76
25': 1.57
26': GW

M39
0.224 J

IAR
0.853 J

M89
0.293 J

SA12
0.5': 1.16
10': 0.98
20': 1.84
30': 1.44
31': GW

SA13
0.5': 1.12
0.5D': 1.06
10': 1.14
20': 1.27
30': 1.73
40': 1.79
41': GW

SA15
0.5': 1.19
10': 1.2
10D': 1.25
20': 1.43
30': 1.91
35': 1.54
37': GW

SA14
0.55

SA15
0.32
0.742 J (S)

M02A
2 U

M76
0.151 J

SA14
0.5': 1.07
10': 2 U
20': 1.35
30': 1.47
37': GW
40': 1.18

SA09
1.45 J

SA10
2.76

M31A
0.434 J

SA08
0.5': 1.07
10': 1.08
20': 1
30': 1.34
37': 3.16
38': GW

SA09
0.5': 1.02
10': 1.12
10D': 1.14
20': 1.62
30': 2.33
40': 2.11
44': GW

M97
0.522 J

M12A
0.273 J

M11
0.162 J
0.237 J

M92
0.209 J

SA07
0.5': 1.12
10': 1.02
10D': 0.939
20': 1.28
30': 1.79
34': 7.49
36': GW

SA10
0.5': 1.1
10': 0.978
10D': 0.759
20': 1.31
30': 1.4
39': GW
40': 1.58

M29
0.745 J
0.603 J (S)

M13
0.163 J

SA11
0.5': 0.947
0.5D': 0.905
10': 1.7
20': 1.06
30': 2.49
32': GW

SA06
0.5': 1.18
0.5D': 1.32
10': 1.07
20': 1.21
30': 1.49
35': 2.1
36': GW

SA03
0.5': 0.997
0.5D': 1.13
10': 1.01
20': 1.19
30': 1.59
40': 2.34
41': GW

SA05
0.5': 1.12
10': 1.07
20': 1.1
30': 2.29
37': 2.46
37': GW

SA04
0.5': 1.1
10': 1.13
20': 1.19
30': 1.45
37': GW
40': 1.6

SA02
10.9

turbidity issue

SA02
0.5': 1.02
10': 1.17
20': 1.15
30': 3.39
40': 1.34
50': 1.3
60': 2.64
65': GW

M120
2 U

SA01
0.5': 1.01
5': 1.25
10': 1.31
10': GW

will default to background for rpt.

= DAF 1

LEGEND

Phase A Investigation

Phase A Groundwater Sample Locations (Location ID and result shown in ug/L)
(S) represents filtered results

Soil Boring Locations

Analyte Detected Above Comparison Level

SA23
0.5': 7.8
10': 0.5 U
19': GW
20': 53

Boring Number
Result (pCi/g)
Data Qualifier (see below)
Depth to Groundwater
Result Above Comparison Level (Bold)
Sample Depth (ft bgs)

U: Not detected (number indicates reporting limit)

J: Result is an estimated value.

Note:
Comparison level for Radium 226 is 0.0000023 pCi/g.

FIGURE NUMBER: 15

SHEET NUMBER: X

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL RADIUM-226 SOURCE AREAS

SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	7/22/2007	04020-023-402

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B HO	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
T MCADAM				
CHECKED BY:				
B HO				
APPROVED BY:				
D GERRY				

0

Table 5-14
Selection of Comparison Levels for Soil for the Soil To Groundwater Migration Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Detected in Soil (h)	USEPA Region 9 PRG-SSL (DAF = 1) (a)	USEPA Region 9 PRG-SSL (DAF = 20) (a)	Selected Groundwater Comparison Level (b)	Soil/Water Partitioning Coefficient (Kd) for Inorganics (c)	Soil/Organic Carbon Partitioning Coefficient (Koc) for Organics (c)	Source of Kd/Koc Data	Henry's Law Constant (K_H) (c)	Source of K_H Data	Site-Specific Soil Screening Level (ssSSL) (DAF = 1) (e)	Site-Specific Soil Screening Level (ssSSL) (DAF = 20) (e)	Comparison Level (DAF=1) (f)	Comparison Level (DAF=20) (f)
	(mg/kg)	(mg/kg)	(mg/L)	(L/kg)	(L/kg)		(Unitless)		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
VOLATILE ORGANIC COMPOUNDS												
1,1,1-Trichloroethane	1.0E-01	2.0E+00									1.00E-01	2.00E+00
1,1-Dichloroethane	1.0E+00	2.3E+01									1.00E+00	2.30E+01
1,2,3-Trichlorobenzene			7.00E-02	--	2.27E+03	(6, 8)	3.64E-01	(6)	2.34E-01	4.68E+00	2.34E-01	4.68E+00
1,2,4-Trichlorobenzene	3.0E-01	5.0E+00									3.00E-01	5.00E+00
1,2-Dichlorobenzene	9.0E-01	1.7E+01									9.00E-01	1.70E+01
1,2-Dichloroethane	1.0E-03	2.0E-02									1.00E-03	2.00E-02
1,3,5-Trimethylbenzene			1.23E-03	--	8.19E+02	(1)	3.16E-01	(1)	1.60E-03	3.19E-02	1.60E-03	3.19E-02
1,3-Dichlorobenzene			1.83E-02	--	6.17E+02	(1)	7.79E-02	(1)	1.80E-02	3.60E-01	1.80E-02	3.60E-01
1,4-Dichlorobenzene	1.0E-01	2.0E+00									1.00E-01	2.00E+00
2-Butanone (MEK)			6.90E-01	--	2.30E+00	(2)	2.29E-03	(2)	7.82E-02	1.56E+00	7.82E-02	1.56E+00
2-Chlorotoluene			1.22E-02	--	1.60E+02	(1)	1.44E-01	(1)	4.30E-03	8.59E-02	4.30E-03	8.59E-02
2-Hexanone			2.00E-01	--	1.48E+01	(6, 8)	7.16E-02	(6)	2.79E-02	5.59E-01	2.79E-02	5.59E-01
Acetone	8.0E-01	1.6E+01									8.00E-01	1.60E+01
Benzene	2.0E-03	3.0E-02									2.00E-03	3.00E-02
Bromoform	4.0E-02	8.0E-01									4.00E-02	8.00E-01
Carbon tetrachloride	3.0E-03	7.0E-02									3.00E-03	7.00E-02
Chlorobenzene	7.0E-02	1.0E+00									7.00E-02	1.00E+00
Chloroform	3.0E-02	6.0E-01									3.00E-02	6.00E-01
Hexachlorobutadiene	1.0E-01	2.0E+00									1.00E-01	2.00E+00
Methylene chloride	1.0E-03	2.0E-02									1.00E-03	2.00E-02
Tetrachloroethylene (PCE)	3.0E-03	6.0E-02									3.00E-03	6.00E-02
Toluene	6.0E-01	1.2E+01									6.00E-01	1.20E+01
Trichloroethylene (TCE)	3.0E-03	6.0E-02									3.00E-03	6.00E-02
Trichlorofluoromethane			1.29E-01	--	1.60E+02	(1)	3.98E+00	(1)	1.09E-01	2.17E+00	1.09E-01	2.17E+00
SEMI-VOLATILE ORGANIC COMPOUNDS												
Benzo(a)anthracene	8.0E-02	2.0E+00									8.00E-02	2.00E+00
Benzo(a)pyrene	4.0E-01	8.0E+00									4.00E-01	8.00E+00
Benzo(b)fluoranthene	2.0E-01	5.0E+00									2.00E-01	5.00E+00
Benzo(g,h,i)perylene			1.83E-02	--	2.80E+06	(5)	5.73E-06	(6)	7.17E+01	1.43E+03	7.17E+01	1.43E+03
Benzo(k)fluoranthene	2.0E+00	4.9E+01									2.00E+00	4.90E+01
bis(2-Ethylhexyl)phthalate			6.00E-03	--	1.51E+07	(4)	4.18E-06	(4)	1.27E+02	2.54E+03	1.27E+02	2.54E+03
Chrysene	8.0E+00	1.6E+02									8.00E+00	1.60E+02
Diethyl phthalate			2.92E+00	--	2.88E+02	(4)	1.85E-05	(4)	1.50E+00	3.00E+01	1.50E+00	3.00E+01
Di-n-butyl phthalate	2.7E+02	2.3E+03									2.70E+02	2.30E+03
Fluoranthene	2.1E+02	4.3E+03									2.10E+02	4.30E+03
Hexachlorobenzene	1.0E-01	2.0E+00									1.00E-01	2.00E+00
Indeno(1,2,3-cd)pyrene	7.0E-01	1.4E+01									7.00E-01	1.40E+01
Naphthalene	4.0E+00	8.4E+01									4.00E+00	8.40E+01
Octachlorostyrene			--	--	9.68E+05	(8, 9)	9.41E-03	(8)	--	--	--	--
Phenanthrene			1.80E-01	--	3.80E+04	(5)	1.61E-03	(6)	9.60E+00	1.92E+02	9.60E+00	1.92E+02
Pyrene	2.1E+02	4.2E+03									2.10E+02	4.20E+03

Table 5-14
Selection of Comparison Levels for Soil for the Soil To Groundwater Migration Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Detected in Soil (h)	USEPA Region 9 PRG-SSL (DAF = 1) (a) (mg/kg)	USEPA Region 9 PRG-SSL (DAF = 20) (a) (mg/kg)	Selected Groundwater Comparison Level (b) (mg/L)	Soil/Water Partitioning Coefficient (Kd) for Inorganics (c) (L/kg)	Soil/Organic Carbon Partitioning Coefficient (Koc) for Organics (c) (L/kg)	Source of Kd/Koc Data	Henry's Law Constant (K_H) (c) (Unitless)	Source of K_H Data	Site-Specific Soil Screening Level (ssSSL) (DAF = 1) (e) (mg/kg)	Site-Specific Soil Screening Level (ssSSL) (DAF = 20) (e) (mg/kg)	Comparison Level (DAF=1) (f) (mg/kg)	Comparison Level (DAF=20) (f) (mg/kg)
PESTICIDES (OCPs and OPPs) and PCBs												
Beta BHC	1.0E-04	3.0E-03									1.00E-04	3.00E-03
4,4'-DDD	8.0E-01	1.6E+01									8.00E-01	1.60E+01
4,4'-DDE	3.0E+00	5.4E+01									3.00E+00	5.40E+01
4,4'-DDT	2.0E+00	3.2E+01									2.00E+00	3.20E+01
Demeton-O			1.46E-04	--	6.31E-02	(8, 9, 10)	1.39E-04	(8, 10)	1.60E-05	3.21E-04	1.60E-05	3.21E-04
Dimethoate			7.30E-04	--	1.68E+02	(6, 9)	4.30E-09	(8)	2.51E-04	5.03E-03	2.51E-04	5.03E-03
Endrin Aldehyde			1.09E-03	--	3.26E+04	(6, 9)	1.58E-05	(6)	4.98E-02	9.97E-01	4.98E-02	9.97E-01
Aroclor-1260			5.00E-04	--	2.91E+05	(8, 9)	1.38E-03	(8)	2.03E-01	4.07E+00	2.03E-01	4.07E+00
Methoxychlor	8.0E+00	1.6E+02									8.00E+00	1.60E+02
METALS												
Aluminum			5.00E-02	1.50E+03	--	(7)	--		7.50E+01	1.50E+03	7.50E+01	1.50E+03
Antimony	3.0E-01	5.0E+00									3.00E-01	5.00E+00
Arsenic	1.0E+00	2.9E+01									1.00E+00	2.90E+01
Barium	8.2E+01	1.6E+03									8.20E+01	1.60E+03
Beryllium	3.0E+00	6.3E+01									3.00E+00	6.30E+01
Boron			7.30E-01	3.00E+00	--	(7)	--		2.27E+00	4.54E+01	2.27E+00	4.54E+01
Cadmium	4.0E-01	8.0E+00									4.00E-01	8.00E+00
Chromium	(g)	(g)	1.00E-01	1.80E+06	--	(5)	--		1.80E+05	3.60E+06	1.80E+05	3.60E+06
Hexavalent, Chromium	2.0E+00	3.8E+01									2.00E+00	3.80E+01
Cobalt			7.30E-02	4.50E+01	--	(7)	--		3.29E+00	6.59E+01	3.29E+00	6.59E+01
Copper			1.30E+00	3.60E+02	--	(5)	--		4.68E+02	9.36E+03	4.68E+02	9.36E+03
Iron			3.00E-01	2.50E+01	--	(7)	--		7.53E+00	1.51E+02	7.53E+00	1.51E+02
Lead			1.50E-02	8.90E+02	--	(5)	--		1.34E+01	2.67E+02	1.34E+01	2.67E+02
Manganese			5.00E-02	6.50E+01	--	(7)	--		3.26E+00	6.51E+01	3.26E+00	6.51E+01
Molybdenum			1.82E-02	2.00E+01	--	(7)	--		3.66E-01	7.32E+00	3.66E-01	7.32E+00
Mercury			2.00E-03	8.20E+01	--	(4)	--		1.64E-01	3.28E+00	1.64E-01	3.28E+00
Nickel	7.0E+00	1.3E+02									7.00E+00	1.30E+02
Platinum			--	9.00E+01	--	(7)	--		--	--	--	--
Silver	2.0E+00	3.4E+01									2.00E+00	3.40E+01
Strontium			2.19E+00	3.50E+01	--	(7)	--		7.69E+01	1.54E+03	7.69E+01	1.54E+03
Thallium			2.00E-03	7.10E+01	--	(5)	--		1.42E-01	2.84E+00	1.42E-01	2.84E+00
Tin			2.19E+00	2.50E+02	--	(7)	--		5.48E+02	1.10E+04	5.48E+02	1.10E+04
Titanium			1.46E+01	1.00E+03	--	(7)	--		1.46E+04	2.92E+05	1.46E+04	2.92E+05
Tungsten			--	1.50E+02	--	(7)	--		--	--	--	--
Uranium			3.00E-02	4.00E-01	--	(3)	--		1.53E-02	3.06E-01	1.53E-02	3.06E-01
Vanadium	3.0E+02	6.0E+03									3.00E+02	6.00E+03
Zinc	6.2E+02	1.2E+04									6.20E+02	1.20E+04
RAD												
Radium-226		--	5.10E-09	4.50E+02		(7)	--		2.30E-06	4.59E-05	2.30E-06	4.59E-05
Radium-228		--	1.80E-11	4.50E+02		(7)	--		8.10E-09	1.62E-07	8.10E-09	1.62E-07
Thorium-228		--	1.80E-11	2.00E+01		(3)	--		3.62E-10	7.24E-09	3.62E-10	7.24E-09
Thorium-230		--	7.40E-07	2.00E+01		(3)	--		1.49E-05	2.98E-04	1.49E-05	2.98E-04
Thorium 232		--	1.40E-01	2.00E+01		(3)	--		2.82E+00	5.63E+01	2.82E+00	5.63E+01
Uranium 233/234		--	3.00E-02	4.00E-01		(3)	--		1.53E-02	3.06E-01	1.53E-02	3.06E-01
Uranium 235/236		--	3.00E-02	4.00E-01		(3)	--		1.53E-02	3.06E-01	1.53E-02	3.06E-01
Uranium 238		--	3.00E-02	4.00E-01		(3)	--		1.53E-02	3.06E-01	1.53E-02	3.06E-01

DEFINITIONS
PRG-SSL: Preliminary Remediation Goal (USEPA, 2004a) Soil Screening Level for the migration to groundwater pathway
Kd: Soil-water Partitioning Coefficient
Koc: Soil-organic carbon Partitioning Coefficient
DAF: Dilution Attenuation Factor
ssSSL: Calculated site-specific soil screening level
-- Value not available/not applicable.
NOTES

Table 5-14
Selection of Comparison Levels for Soil for the Soil To Groundwater Migration Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Detected in Soil (h)	USEPA Region 9 PRG-SSL (DAF = 1) (a) (mg/kg)	USEPA Region 9 PRG-SSL (DAF = 20) (a) (mg/kg)	Selected Groundwater Comparison Level (b) (mg/L)	Soil/Water Partitioning Coefficient (Kd) for Inorganics (c) (L/kg)	Soil/Organic Carbon Partitioning Coefficient (Koc) for Organics (c) (L/kg)	Source of Kd/Koc Data	Henry's Law Constant (K_H) (c) (Unitless)	Source of K_H Data	Site-Specific Soil Screening Level (ssSSL) (DAF = 1) (e) (mg/kg)	Site-Specific Soil Screening Level (ssSSL) (DAF = 20) (e) (mg/kg)	Comparison Level (DAF=1) (f) (mg/kg)	Comparison Level (DAF=20) (f) (mg/kg)
Calculations were not performed for radionuclides, because results are activities that do not have fate and transport properties.												
Due to their low solubility, dioxins and furans are not expected to migrate to groundwater.												
The soil to groundwater pathway is assumed to be complete for infinitely soluble constituents (e.g., perchlorate, chloride, sodium, nitrate, sulfate, calcium).												

FOOTNOTES

(a) Preliminary Remediation Goals are those provided by USEPA (2004a) for migration to groundwater with a DAF of 20.
(b) Comparison Levels are presented in Table 5-1. Concentrations for radionucliides converted from activities per USEPA (2000).
(c) Chemical properties were selected from the following sources, in order of priority:
(1) USEPA (2004a).
(2) USEPA (2004c).
(3) USEPA (2000)
(4) USEPA (1996).
(5) PADEP (2007).
(6) USEPA (1992).
(7) ORNL (1985).
(8) Howard & Meylan (1997).
(9) Estimated from referenced Kow, per USEPA (1996). Appendix K.
(10) Demeton used as surrogate. Kow estimated from Koc, based on LFER for misc. pesticides in Table 7.2 of Schwarzenbach et al. (1993).
(e) Values calculated per text. See Section 5.5.2.
(f) Comparison level is the PRG-SSL; where a PRG-SSL is unavailable, the ssSSL was used.
(g) Site-specific SSL calculated for total chromium assuming trivalent chromium (PRG-SSL used for hexavalent chromium).
(h) Calculations were not performed for petroleum hydrocarbons and other constituents for which there is no comparison value for groundwater.

Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
Chemistry											
EPA 310.1											
Alkalinity (as CaCO3)	Alk as CaCO3	mg/kg	74 : 116 : 116	4.84E+01	1.44E+03	1.65E+02	SA14		Include		Include
Bicarbonate Alkalinity	71-52-3	mg/kg	113 : 116 : 116	7.29E+01	8.36E+03	6.85E+02	SA25		Include		Include
Total Alkalinity	T-ALK	mg/kg	116 : 116 : 116	7.44E+01	8.86E+03	8.46E+02	SA25		Include		Include
EPA 350.1											
Ammonia (as N)	7664-41-7	mg/kg	10 : 103 : 102	8.00E-01	9.28E+02	2.27E+01	SA15		Include		Include
SM 5540C											
MBAS	MBAS	mg/kg	21 : 116 : 116	1.63E+00	5.90E+00	2.13E+00	SA08		Exclude		Exclude
SW 846 9056											
Bromide	24959-67-9	mg/kg	18 : 116 : 116	9.50E-01	9.20E+01	4.10E+00	SA04		Exclude		Exclude
Chlorate	14866-68-3	mg/kg	58 : 114 : 114	1.40E+00	1.37E+03	6.70E+01	SA11		Include		Include
Chloride	16887-00-6	mg/kg	113 : 116 : 116	9.50E-01	5.60E+03	3.77E+02	SA05		Include		Include
Nitrate	NO3	mg/kg	107 : 116 : 116	1.70E-01	2.79E+02	8.97E+00	SA15		Include		Include
Nitrite	14797-65-0	mg/kg	62 : 109 : 109	4.70E-02	2.13E+01	2.15E+00	SA14		Include		Include
ortho-Phosphate	o-PO4	mg/kg	62 : 116 : 116	1.20E+00	8.89E+03	2.15E+02	SA05		Include		Include
Sulfate	14808-79-8	mg/kg	116 : 116 : 116	5.40E+00	1.51E+04	1.31E+03	SA08		Include		Include
SW 846 9060											
Total Organic Carbon	TOC	mg/kg	116 : 116 : 116	2.00E+02	3.86E+04	8.04E+03	SA15		Exclude		Exclude
DIOXINS											
8290 SCREEN											
Total TEQ - ENSR Calculated	TTEQ-b	ng/kg	27 : 27 : 27	6.30E-02	1.15E+03	1.32E+02	SA16		Exclude		Exclude
SW 846 8290											
Total TEQ - ENSR Calculated	TTEQ-b	ng/kg	7 : 7 : 7	8.20E-01	8.94E+02	3.83E+02	SA16		Exclude		Exclude
Metals											
SW 846 6020											

Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
Aluminum	7429-90-5	mg/kg	116 : 116 : 116	3.68E+03	1.88E+04	7.83E+03	SA09	7.50E+01	YES	1.50E+03	YES
Antimony	7440-36-0	mg/kg	115 : 116 : 116	8.00E-02	6.50E+00	2.23E-01	SA09	3.00E-01	YES	5.00E+00	YES
Arsenic	7440-38-2	mg/kg	116 : 116 : 116	1.60E+00	6.16E+01	9.64E+00	SA03	1.00E+00	YES	2.90E+01	YES
Barium	7440-39-3	mg/kg	116 : 116 : 116	2.52E+01	1.20E+03	1.55E+02	SA09	8.20E+01	YES	1.60E+03	NO
Beryllium	7440-41-7	mg/kg	116 : 116 : 116	2.00E-01	9.80E-01	4.83E-01	SA12	3.00E+00	NO	6.30E+01	NO
Boron	7440-42-8	mg/kg	44 : 116 : 116	2.50E+00	4.86E+01	7.91E+00	SA07	2.27E+00	YES	4.54E+01	YES
Cadmium	7440-43-9	mg/kg	115 : 116 : 116	2.20E-02	1.70E+00	1.09E-01	SA15	4.00E-01	YES	8.00E+00	NO
Calcium	7440-70-2	mg/kg	109 : 116 : 116	2.17E+03	1.87E+05	2.94E+04	SA14		Include		Include
Chromium	7440-47-3	mg/kg	116 : 116 : 116	4.70E+00	6.33E+01	1.37E+01	SA17	1.80E+05	NO	3.60E+06	NO
Cobalt	7440-48-4	mg/kg	116 : 116 : 116	2.40E+00	1.20E+01	5.67E+00	SA17	3.29E+00	YES	6.59E+01	NO
Copper	7440-50-8	mg/kg	115 : 116 : 116	5.80E+00	1.99E+02	1.36E+01	SA17	4.68E+02	NO	9.36E+03	NO
Iron	7439-89-6	mg/kg	116 : 116 : 116	4.89E+03	2.03E+04	1.12E+04	SA10	7.53E+00	YES	1.51E+02	YES
Lead	7439-92-1	mg/kg	116 : 116 : 116	4.00E+00	3.05E+02	1.17E+01	SA09	1.34E+01	YES	2.67E+02	YES
Magnesium	7439-95-4	mg/kg	112 : 116 : 116	3.97E+03	6.37E+04	1.34E+04	SA16		Include		Include
Manganese	7439-96-5	mg/kg	116 : 116 : 116	5.88E+01	6.66E+03	3.48E+02	SA09	3.26E+00	YES	6.51E+01	YES
Molybdenum	7439-98-7	mg/kg	107 : 116 : 116	2.80E-01	5.30E+00	6.09E-01	SA09	3.66E-01	YES	7.32E+00	NO
Nickel	7440-02-0	mg/kg	116 : 116 : 116	5.20E+00	3.04E+01	1.27E+01	SA09	7.00E+00	YES	1.30E+02	NO
Platinum	7440-06-4	mg/kg	72 : 116 : 116	9.00E-03	7.70E-02	1.35E-02	SA07		Exclude		Exclude
Potassium	7440-09-7	mg/kg	109 : 116 : 116	9.80E+02	5.21E+03	1.94E+03	SA25		Include		Include
Silver	7440-22-4	mg/kg	115 : 116 : 116	6.10E-02	4.80E-01	1.37E-01	SA17	2.00E+00	NO	3.40E+01	NO
Sodium	7440-23-5	mg/kg	104 : 116 : 116	2.14E+02	4.91E+03	1.02E+03	SA14		Include		Include
Strontium	7440-24-6	mg/kg	111 : 116 : 116	4.61E+01	2.28E+03	2.35E+02	SA07	7.69E+01	YES	1.54E+03	YES
Thallium	7440-28-0	mg/kg	49 : 116 : 116	6.80E-02	2.90E+00	1.20E-01	SA09	1.42E-01	YES	2.84E+00	YES
Tin	7440-31-5	mg/kg	112 : 116 : 116	2.70E-01	1.20E+00	5.13E-01	SA08	5.48E+02	NO	1.10E+04	NO
Titanium	7440-32-6	mg/kg	116 : 116 : 116	2.52E+02	8.18E+02	4.79E+02	SA13	1.46E+04	NO	2.92E+05	NO
Tungsten	7440-33-7	mg/kg	75 : 116 : 116	1.50E-01	1.15E+01	5.61E-01	SA17		Exclude		Exclude
Uranium	7440-61-1	mg/kg	114 : 116 : 116	6.80E-01	1.06E+01	1.99E+00	SA03	1.53E-02	YES	3.06E-01	YES
Vanadium	7440-62-2	mg/kg	116 : 116 : 116	1.37E+01	5.63E+01	3.12E+01	SA13	3.00E+02	NO	6.00E+03	NO
Zinc	7440-66-6	mg/kg	106 : 116 : 116	1.49E+01	1.79E+02	2.76E+01	SA17	6.20E+02	NO	1.20E+04	NO
SW 846 7199											
CR, Hexavalent	18540-29-9	mg/kg	40 : 116 : 116	1.08E-01	1.18E+01	5.69E-01	SA11	2.00E+00	YES	3.80E+01	NO

Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
SW 846 7471											
Mercury	7439-97-6	mg/kg	27 : 115 : 116	7.28E-03	2.60E-02	6.34E-03	SA11	1.64E-01	NO	3.28E+00	NO
O. Pesticides											
SW 846 8141A											
Demeton-O	298-03-3	mg/kg	1 : 28 : 28	5.75E-02	5.75E-02	2.30E-02	SA17	1.60E-05	YES	3.21E-04	YES
Dimethoate	60-51-5	mg/kg	2 : 27 : 28	1.15E-02	1.30E-02	1.21E-02	SA05	2.51E-04	YES	5.03E-03	YES
PCB											
SW 846 8082											
Aroclor-1260	11096-82-5	mg/kg	1 : 116 : 116	4.70E-01	4.70E-01	2.33E-02	SA09	2.03E-01	YES	4.07E+00	NO
Perchlorate											
EPA 314.0											
Perchlorate	14797-73-0	mg/kg	111 : 116 : 116	2.89E-02	2.33E+03	8.21E+01	SA15		Include		Include
Pesticide											
SW 846 8081											
4,4-DDD	72-54-8	mg/kg	2 : 30 : 30	6.90E-03	2.70E-02	2.75E-03	SA09	8.00E-01	NO	1.60E+01	NO
4,4-DDE	72-55-9	mg/kg	8 : 30 : 30	1.45E-03	6.20E-01	4.11E-02	SA09	3.00E+00	NO	5.40E+01	NO
4,4-DDT	50-29-3	mg/kg	7 : 30 : 30	1.50E-03	6.60E-01	3.08E-02	SA14	2.00E+00	NO	3.20E+01	NO
Beta-BHC	319-85-7	mg/kg	14 : 30 : 30	1.80E-03	1.30E+00	5.13E-02	SA09	1.00E-04	YES	3.00E-03	YES
Endrin Aldehyde	7421-93-4	mg/kg	2 : 30 : 30	1.70E-02	3.80E-02	3.46E-03	SA14	4.98E-02	NO	9.97E-01	NO
Methoxychlor	72-43-5	mg/kg	4 : 30 : 30	4.75E-03	5.00E-02	5.45E-03	SA17	8.00E+00	NO	1.60E+02	NO
RAD											
HASL-300 gamma											
Ra-226	Ra-226	pci/g	114 : 116 : 116	8.69E-01	7.49E+00	1.47E+00	SA07	2.30E-06	YES	4.59E-05	YES
Ra-228	Ra-228	pci/g	109 : 116 : 116	6.76E-01	2.11E+00	1.60E+00	SA15	8.10E-09	YES	1.62E-07	YES
HASL-300 TH MOD											

Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
Th-228	Th-228	pci/g	12 : 12 : 12	4.81E-01	1.12E+00	7.00E-01	SA02	3.62E-10	YES	7.24E-09	YES
Th-230	Th-230	pci/g	12 : 12 : 12	4.16E-01	2.23E+00	8.18E-01	SA05	1.49E-05	YES	2.98E-04	YES
Th-232	Th-232	pci/g	12 : 12 : 12	5.39E-01	9.94E-01	6.98E-01	SA02	2.82E+00	NO	5.63E+01	NO
HASL-300 U MOD											
URANIUM-233/234	U-234 SOL	pci/g	12 : 12 : 12	2.60E-01	1.58E+00	6.87E-01	SA05	1.53E-02	YES	3.06E-01	YES
URANIUM-235/236	U-235 SOL	pci/g	6 : 12 : 12	7.27E-03	4.69E-02	1.50E-02	SA05	1.53E-02	YES	3.06E-01	NO
URANIUM-238	U-238 SOL	pci/g	12 : 12 : 12	1.42E-01	1.37E+00	4.92E-01	SA05	1.53E-02	YES	3.06E-01	YES
SVOC											
SW 846 8260											
Naphthalene	91-20-3	mg/kg	1 : 1 : 116	7.90E-04	7.90E-04	7.90E-04	SA08	4.00E+00	NO	8.40E+01	NO
SW 846 8270											
Benz(a)anthracene	56-55-3	mg/kg	2 : 2 : 116	4.00E-02	9.00E-02	6.50E-02	SA09	8.00E-02	YES	2.00E+00	NO
Benzo(a)pyrene	50-32-8	mg/kg	2 : 2 : 116	4.50E-02	7.90E-02	6.20E-02	SA09	4.00E-01	NO	8.00E+00	NO
Benzo(b)fluoranthene	205-99-2	mg/kg	2 : 2 : 116	7.70E-02	1.10E-01	9.35E-02	SA09	2.00E-01	NO	5.00E+00	NO
Benzo(g,h,i)perylene	191-24-2	mg/kg	2 : 2 : 116	4.80E-02	6.90E-02	5.85E-02	SA09	7.17E+01	NO	1.43E+03	NO
Benzo(k)fluoranthene	207-08-9	mg/kg	2 : 2 : 116	4.90E-02	1.10E-01	7.95E-02	SA09	2.00E+00	NO	4.90E+01	NO
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg	6 : 116 : 116	5.10E-02	3.00E-01	1.93E-01	SA11	1.27E+02	NO	2.54E+03	NO
Chrysene	218-01-9	mg/kg	2 : 2 : 116	7.10E-02	1.30E-01	1.01E-01	SA09	8.00E+00	NO	1.60E+02	NO
Diethyl phthalate	84-66-2	mg/kg	2 : 110 : 116	1.50E-01	2.60E-01	1.90E-01	SA14	1.50E+00	NO	3.00E+01	NO
Di-N-Butyl phthalate	84-74-2	mg/kg	1 : 116 : 116	4.22E-01	4.22E-01	1.97E-01	SA15	2.70E+02	NO	2.30E+03	NO
Fluoranthene	206-44-0	mg/kg	2 : 57 : 116	8.50E-02	1.80E-01	1.76E-01	SA09	2.10E+02	NO	4.30E+03	NO
Hexachlorobenzene	118-74-1	mg/kg	6 : 116 : 116	5.30E-02	5.75E-01	1.96E-01	SA11	1.00E-01	YES	2.00E+00	NO
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	1 : 1 : 116	6.20E-02	6.20E-02	6.20E-02	SA09	7.00E-01	NO	1.40E+01	NO
Octachlorostyrene	29082-74-4	mg/kg	2 : 95 : 116	1.30E-01	2.00E-01	1.84E-01	SA11		Exclude		Exclude
Phenanthrene	85-01-8	mg/kg	1 : 1 : 116	5.90E-02	5.90E-02	5.90E-02	SA09	9.60E+00	NO	1.92E+02	NO
Pyrene	129-00-0	mg/kg	2 : 2 : 116	7.80E-02	1.60E-01	1.19E-01	SA09	2.10E+02	NO	4.20E+03	NO
SW 846 8270 SIM											
Benz(a)anthracene	56-55-3	mg/kg	1 : 13 : 13	1.20E-02	1.20E-02	4.29E-03	SA09	8.00E-02	NO	2.00E+00	NO
Benzo(a)pyrene	50-32-8	mg/kg	1 : 13 : 13	1.30E-02	1.30E-02	4.37E-03	SA09	4.00E-01	NO	8.00E+00	NO

Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

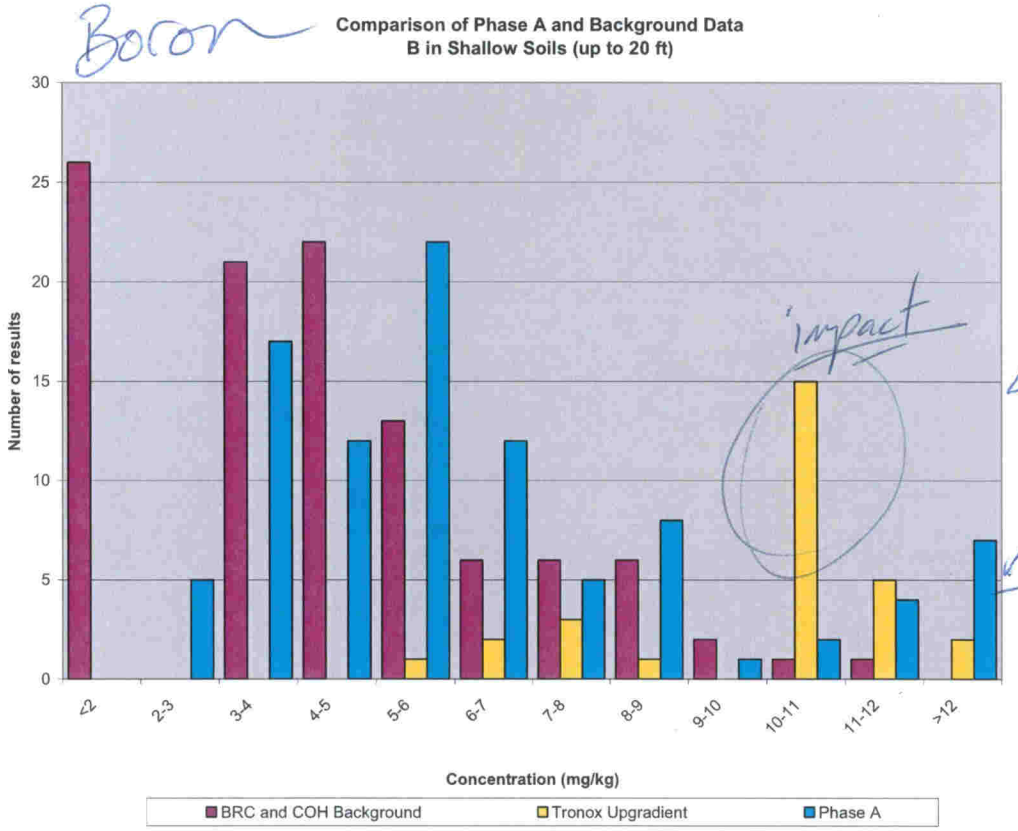
Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
Benzo(b)fluoranthene	205-99-2	mg/kg	1 : 13 : 13	2.20E-02	2.20E-02	5.06E-03	SA09	2.00E-01	NO	5.00E+00	NO
Benzo(g,h,i)perylene	191-24-2	mg/kg	1 : 13 : 13	2.30E-02	2.30E-02	5.13E-03	SA09	7.17E+01	NO	1.43E+03	NO
Benzo(k)fluoranthene	207-08-9	mg/kg	1 : 13 : 13	1.60E-02	1.60E-02	4.60E-03	SA09	2.00E+00	NO	4.90E+01	NO
Chrysene	218-01-9	mg/kg	2 : 13 : 13	7.00E-03	2.40E-02	5.48E-03	SA09	8.00E+00	NO	1.60E+02	NO
Fluoranthene	206-44-0	mg/kg	2 : 13 : 13	1.70E-02	2.70E-02	6.48E-03	SA08	2.10E+02	NO	4.30E+03	NO
Hexachlorobenzene	118-74-1	mg/kg	7 : 13 : 13	6.77E-03	7.70E-02	1.80E-02	SA14	1.00E-01	NO	2.00E+00	NO
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	1 : 13 : 13	1.90E-02	1.90E-02	4.83E-03	SA09	7.00E-01	NO	1.40E+01	NO
Phenanthrene	85-01-8	mg/kg	1 : 13 : 13	1.00E-02	1.00E-02	4.13E-03	SA09	9.60E+00	NO	1.92E+02	NO
Pyrene	129-00-0	mg/kg	3 : 13 : 13	5.25E-03	2.30E-02	5.93E-03	SA09	2.10E+02	NO	4.20E+03	NO
TPH											
SW 846 8015B DRO											
Oil Range Organics	TPH-MOTOR	mg/kg	6 : 86 : 87	4.00E+00	1.01E+02	1.65E+01	SA26		Exclude		Exclude
Total petroleum hydrocarbon-diesel	TPH-diesel	mg/kg	2 : 87 : 87	5.10E+00	3.60E+03	5.61E+01	SA08		Exclude		Exclude
SW 846 8015B GRO											
Total petroleum hydrocarbon-gasoline	TPH-gasoline	mg/kg	4 : 87 : 87	1.30E-01	3.20E+00	1.36E-01	SA09		Exclude		Exclude
VOC											
SW 846 8260											
1,1,1-Trichloroethane	71-55-6	mg/kg	4 : 4 : 116	3.70E-04	9.50E-04	5.97E-04	SA08	1.00E-01	NO	2.00E+00	NO
1,1-Dichloroethane	75-34-3	mg/kg	7 : 116 : 116	1.40E-03	1.10E-02	2.99E-03	SA25	1.00E+00	NO	2.30E+01	NO
1,2,3-Trichlorobenzene	87-61-6	mg/kg	8 : 116 : 116	1.20E-03	1.40E+00	1.51E-02	SA14	2.34E-01	YES	4.68E+00	NO
1,2,4-Trichlorobenzene	120-82-1	mg/kg	7 : 116 : 116	1.70E-03	1.50E+00	1.61E-02	SA14	3.00E-01	YES	5.00E+00	NO
1,2-Dichlorobenzene	95-50-1	mg/kg	10 : 116 : 116	2.90E-04	1.80E-01	5.66E-03	SA09	9.00E-01	NO	1.70E+01	NO
1,2-Dichloroethane	107-06-2	mg/kg	2 : 97 : 116	1.90E-03	3.20E-03	2.79E-03	SA19	1.00E-03	YES	2.00E-02	NO
1,3,5-Trimethylbenzene	108-67-8	mg/kg	1 : 1 : 116	3.00E-04	3.00E-04	3.00E-04	SA20	1.60E-03	NO	3.19E-02	NO
1,3-Dichlorobenzene	541-73-1	mg/kg	2 : 116 : 116	1.40E-02	1.50E-02	3.14E-03	SA14	1.80E-02	NO	3.60E-01	NO
1,4-Dichlorobenzene	106-46-7	mg/kg	29 : 116 : 116	1.20E-04	7.60E-01	1.19E-02	SA09	1.00E-01	YES	2.00E+00	NO
2-Butanone	78-93-3	mg/kg	8 : 116 : 116	1.70E-03	3.80E-02	6.28E-03	SA08	7.82E-02	NO	1.56E+00	NO
2-Chlorotoluene	95-49-8	mg/kg	1 : 1 : 116	8.30E-04	8.30E-04	8.30E-04	SA25	4.30E-03	NO	8.59E-02	NO
2-Hexanone	591-78-6	mg/kg	1 : 1 : 116	3.80E-03	3.80E-03	3.80E-03	SA08	2.79E-02	NO	5.59E-01	NO

Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
Acetone	67-64-1	mg/kg	23 : 116 : 116	4.30E-03	2.50E-01	1.23E-02	SA08	8.00E-01	NO	1.60E+01	NO
Benzene	71-43-2	mg/kg	12 : 116 : 116	1.90E-04	4.10E+00	6.07E-02	SA09	2.00E-03	YES	3.00E-02	YES
Bromoform	75-25-2	mg/kg	1 : 1 : 116	9.30E-04	9.30E-04	9.30E-04	SA11	4.00E-02	NO	8.00E-01	NO
Carbon tetrachloride	56-23-5	mg/kg	4 : 116 : 116	2.30E-03	1.60E-02	3.16E-03	SA09	3.00E-03	YES	7.00E-02	NO
Chlorobenzene	108-90-7	mg/kg	12 : 116 : 116	8.00E-04	1.20E+01	1.76E-01	SA09	7.00E-02	YES	1.00E+00	YES
Chloroform	67-66-3	mg/kg	52 : 116 : 116	1.80E-04	6.80E+00	1.53E-01	SA14	3.00E-02	YES	6.00E-01	YES
Hexachlorobutadiene	87-68-3	mg/kg	5 : 116 : 116	3.80E-04	1.10E-02	2.97E-03	SA14	1.00E-01	NO	2.00E+00	NO
Methylene chloride	75-09-2	mg/kg	5 : 116 : 116	3.80E-03	4.00E-02	3.50E-03	SA21	1.00E-03	YES	2.00E-02	YES
Tetrachloroethene	127-18-4	mg/kg	7 : 116 : 116	6.60E-04	8.10E-03	2.89E-03	SA09	3.00E-03	YES	6.00E-02	NO
Toluene	108-88-3	mg/kg	15 : 15 : 116	2.50E-04	8.20E-04	4.28E-04	SA08	6.00E-01	NO	1.20E+01	NO
Trichloroethene	79-01-6	mg/kg	7 : 116 : 116	1.10E-03	8.80E-03	3.01E-03	SA16	3.00E-03	YES	6.00E-02	NO
Trichlorofluoromethane	75-69-4	mg/kg	3 : 116 : 116	1.20E-03	1.40E-02	3.01E-03	SA09	1.09E-01	NO	2.17E+00	NO

Notes:
CAS - Chemical Abstracts Service number or other identifier.
SRC - Site-Related Chemical.
TEQ - Toxic Equivalent. Total TEQs calculated by ENSR assuming a value of 1/2 the detection limit for non detected results and using the 2006 toxic equivalency factors (van den Berg, et al. 2006).
(a) Only chemicals with at least one positively detected result are reported.
(b) Frequency of detection - Number of detected samples: Number of samples used to calculate statistics: Number of total samples.
(c) Minimum detected concentration for each chemical, after duplicates have been averaged.
(d) Maximum detected concentration for each chemical, after duplicates have been averaged.
(e) Arithmetic mean concentration for each chemical, after duplicates have been averaged and any non detected results with a sample quantitation limit greater than the maximum detected concentration have been excluded.
(f) See Table 5-14 for comparison levels, as well as references, footnotes and synonyms.

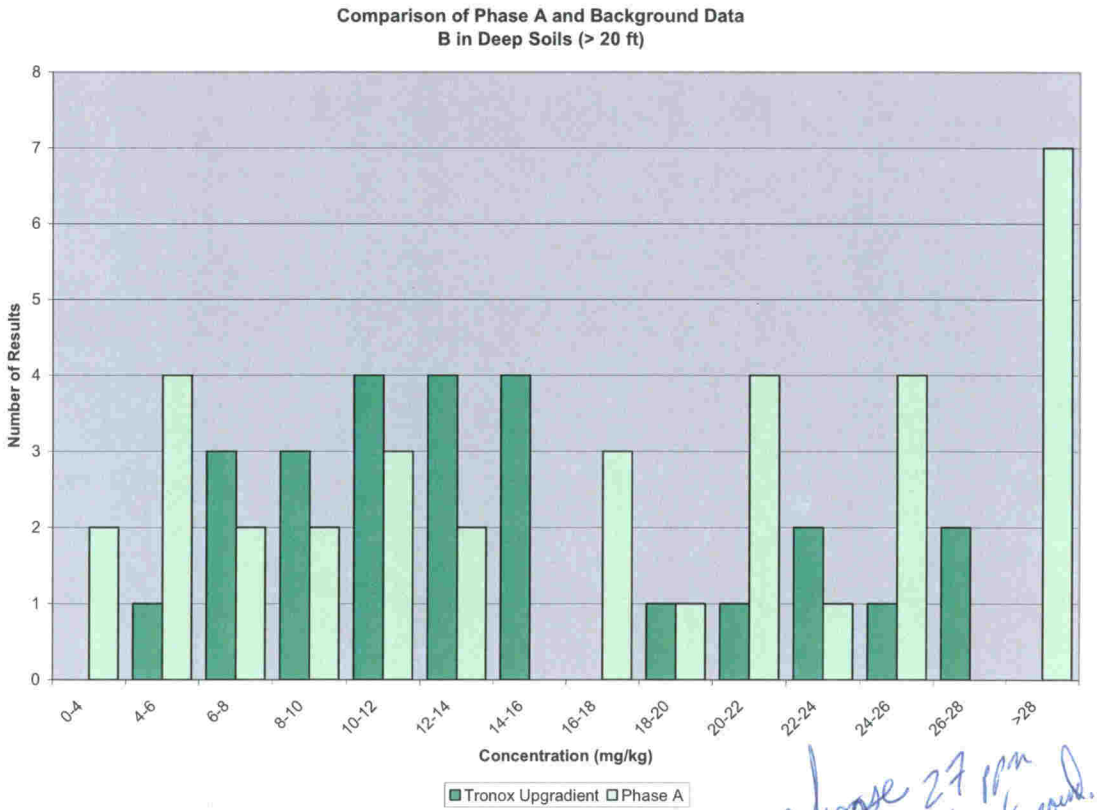
Boron



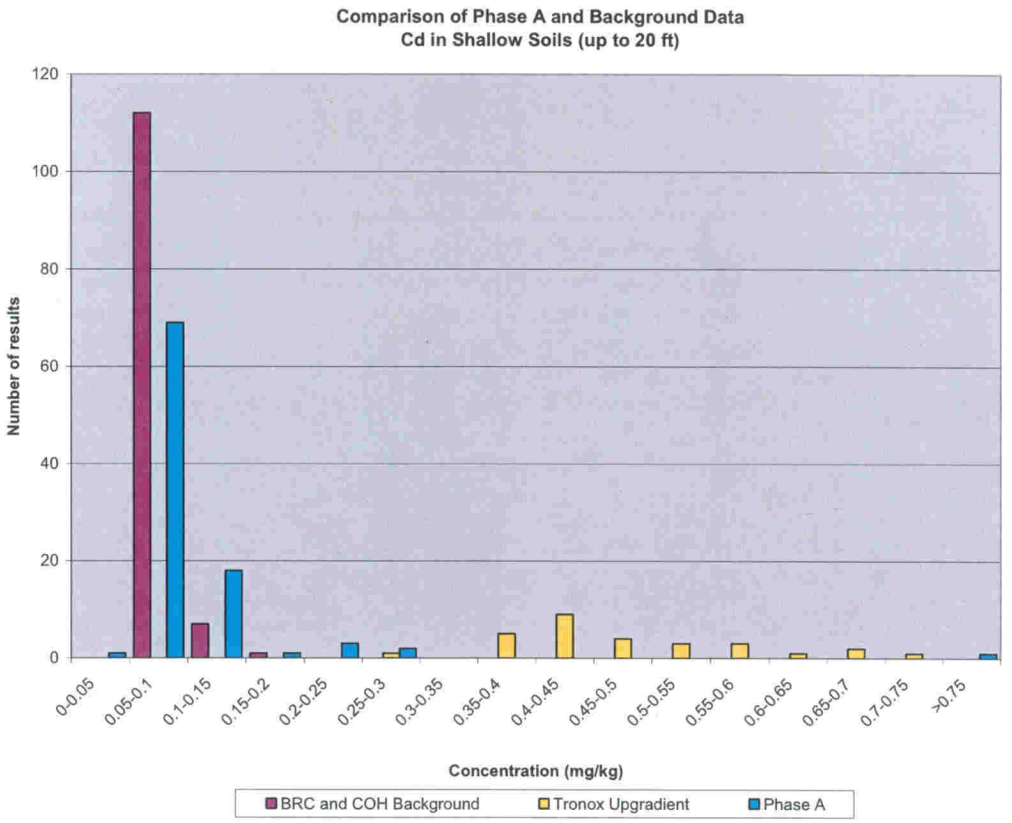
impact

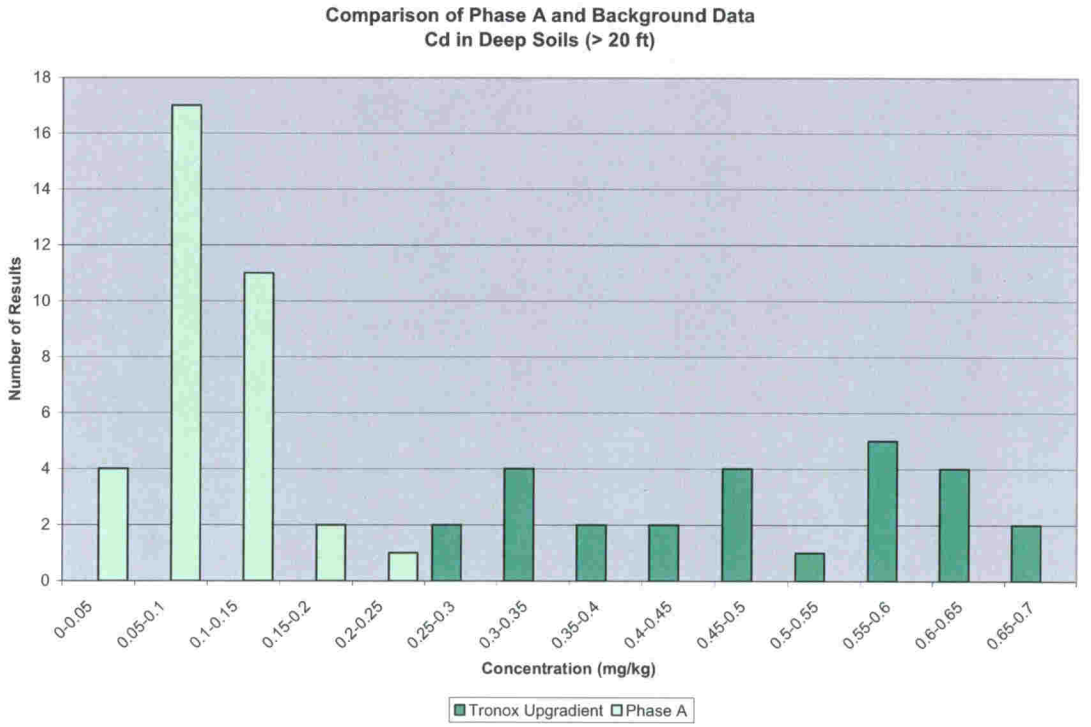
← comparing 20 ft & 10 ft data

NDEP: either explain in text or remove from fig

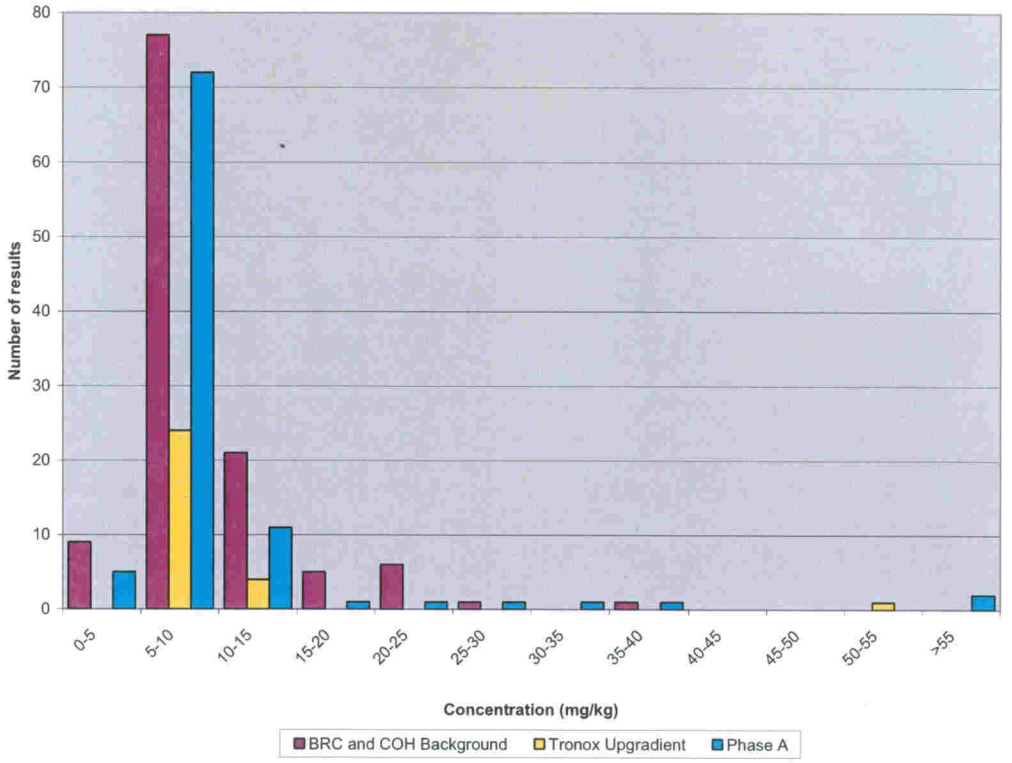


choose 27 ppm for background.

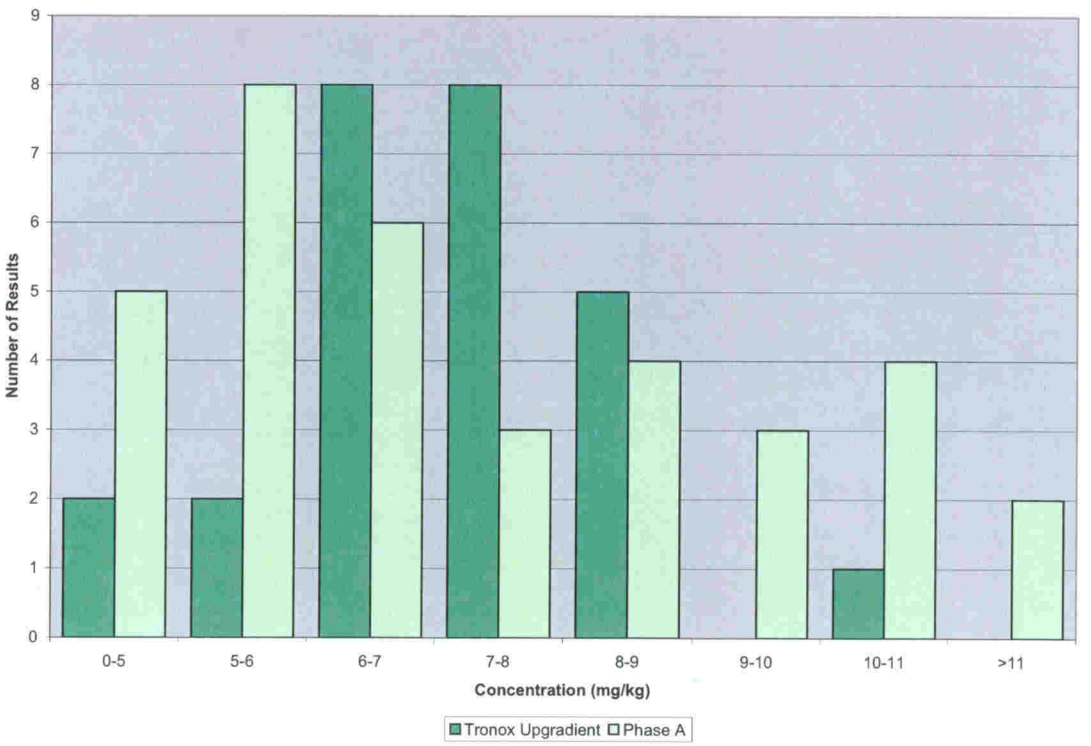

Comparison of Phase A and Background Data
Cd in Shallow Soils (up to 20 ft)
Number of results
120
100
80
60
40
20
0
0-0.05
0.05-0.1
0.1-0.15
0.15-0.2
0.2-0.25
0.25-0.3
0.3-0.35
0.35-0.4
0.4-0.45
0.45-0.5
0.5-0.55
0.55-0.6
0.6-0.65
0.65-0.7
0.7-0.75
>0.75
Concentration (mg/kg)
BRC and COH Background
Tronox Upgradient
Phase A

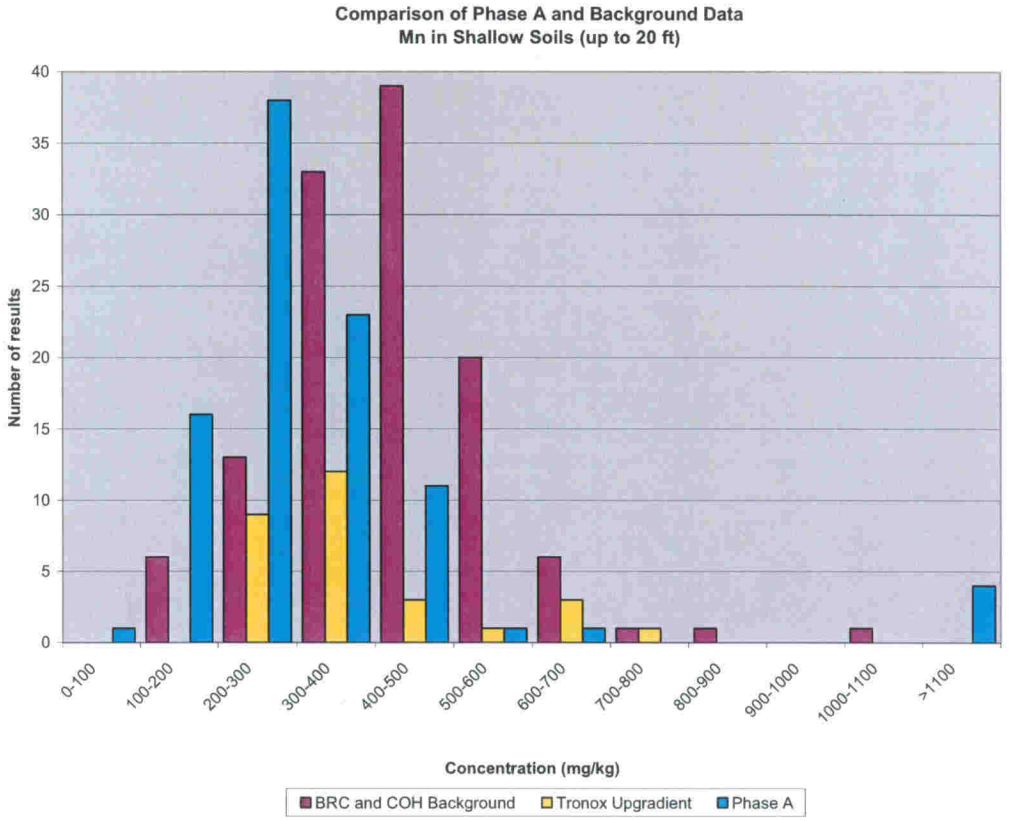

Comparison of Phase A and Background Data
Cd in Deep Soils (> 20 ft)
Number of Results
18
16
14
12
10
8
6
4
2
0
0-0.05
0.05-0.1
0.1-0.15
0.15-0.2
0.2-0.25
0.25-0.3
0.3-0.35
0.35-0.4
0.4-0.45
0.45-0.5
0.5-0.55
0.55-0.6
0.6-0.65
0.65-0.7
Concentration (mg/kg)
Tronox Upgradient
Phase A

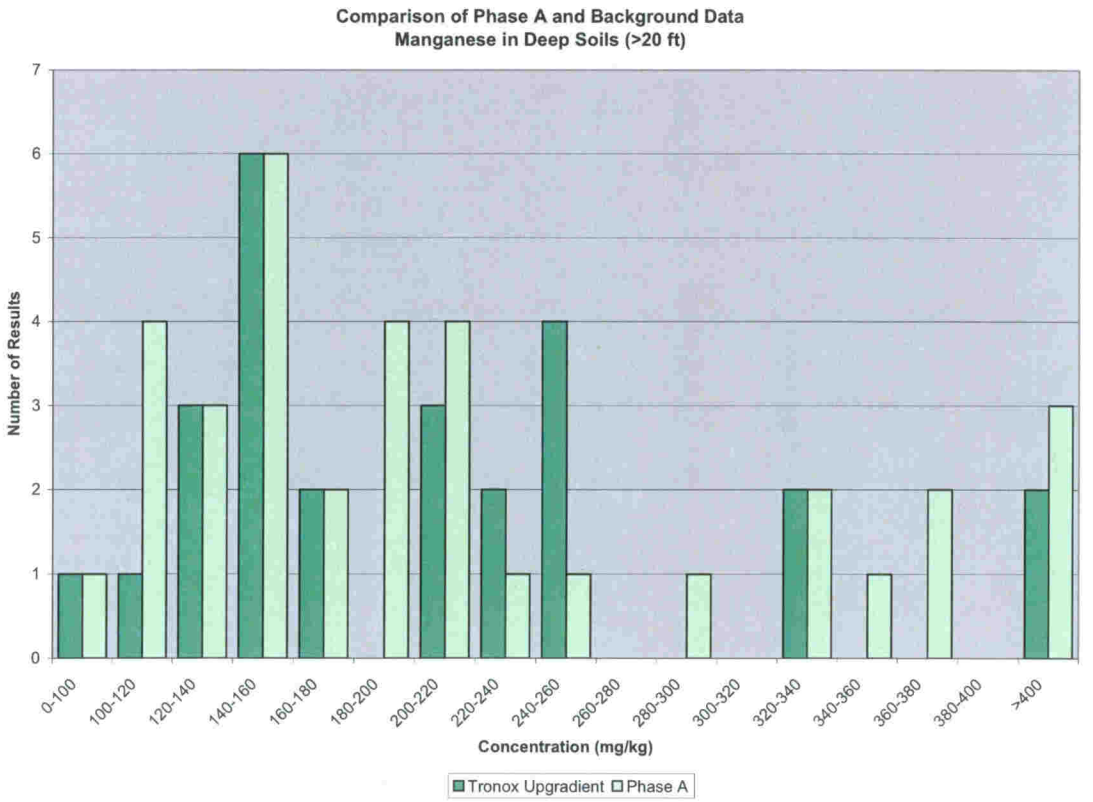
Comparison of Phase A and Background Data
Pb in Shallow Soils (up to 20 ft)



Comparison of Phase A and Background Data
Lead in Deep Soils (>20 ft)

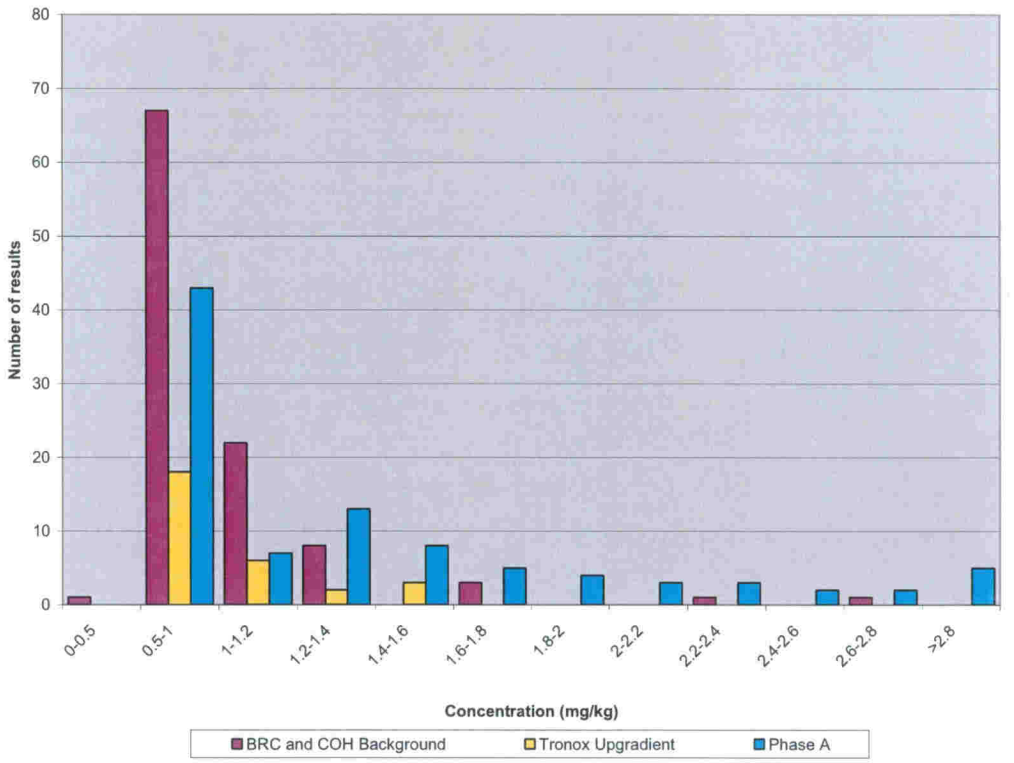



Comparison of Phase A and Background Data
Mn in Shallow Soils (up to 20 ft)
Number of results
0
5
10
15
20
25
30
35
40
0-100
100-200
200-300
300-400
400-500
500-600
600-700
700-800
800-900
900-1000
1000-1100
>1100
Concentration (mg/kg)
BRC and COH Background
Tronox Upgradient
Phase A

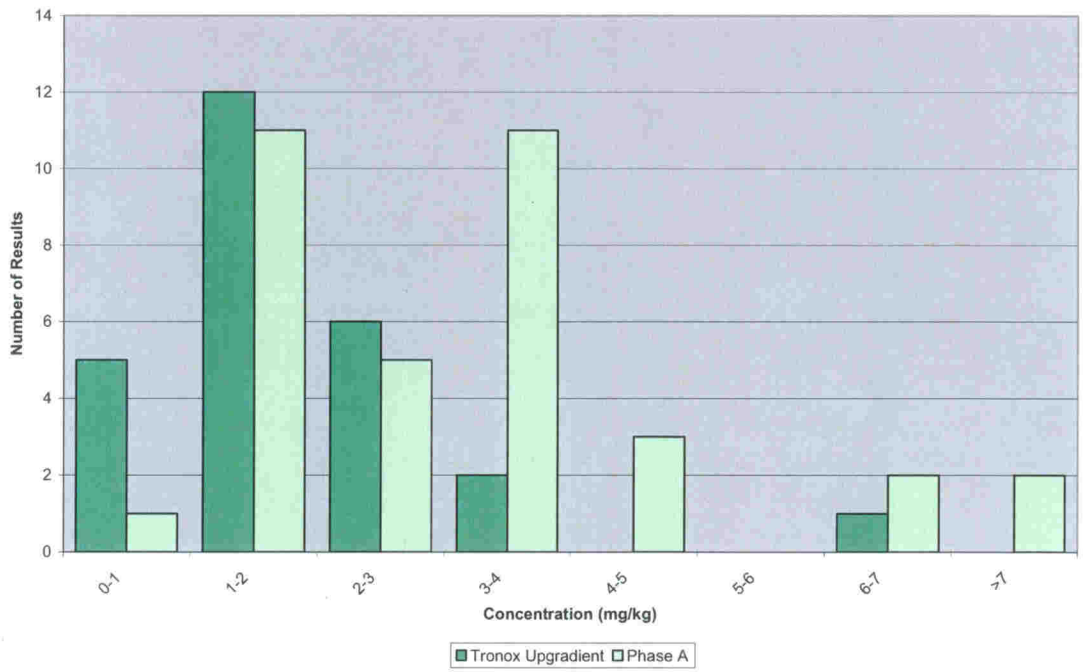

Comparison of Phase A and Background Data
Manganese in Deep Soils (>20 ft)
Number of Results
0
1
2
3
4
5
6
7
0-100
100-120
120-140
140-160
160-180
180-200
200-220
220-240
240-260
260-280
280-300
300-320
320-340
340-360
360-380
380-400
>400
Concentration (mg/kg)
Tronox Upgradient
Phase A

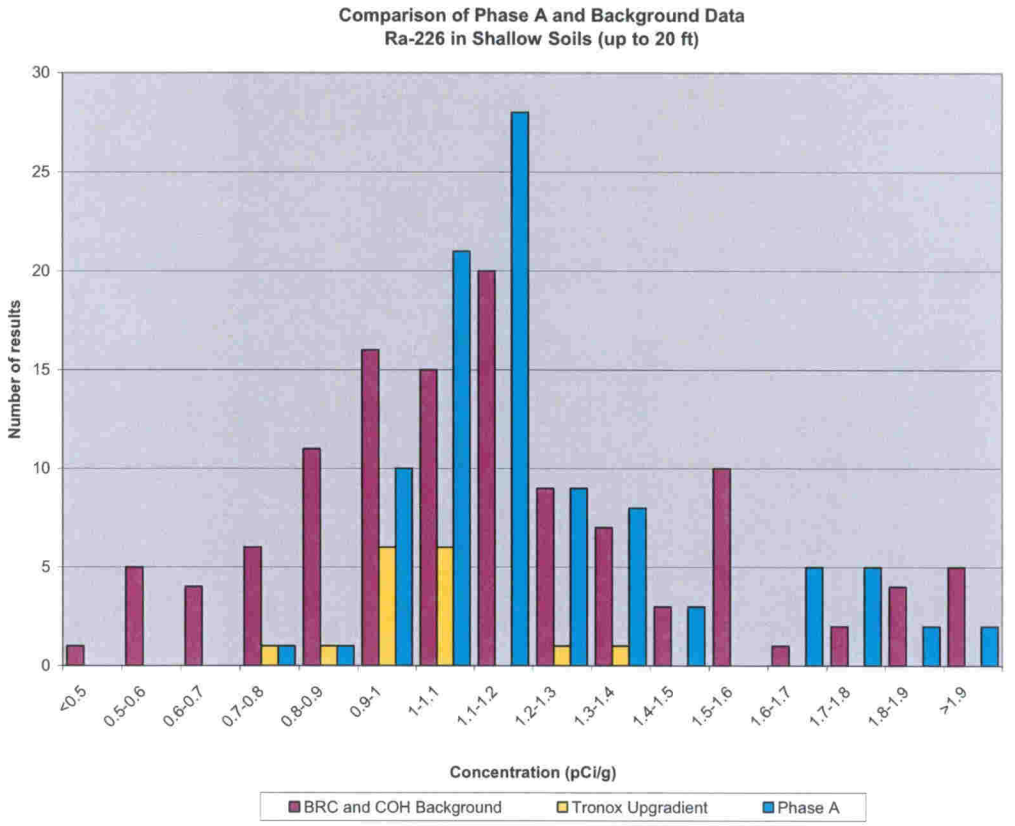
Uranium

Comparison of Phase A and Background Data
U in Shallow Soils (up to 20 ft)



Comparison of Phase A and Background Data
U in Deep Soils (> 20 ft)




Comparison of Phase A and Background Data
Ra-226 in Shallow Soils (up to 20 ft)
Number of results
30
25
20
15
10
5
0
<0.5
0.5-0.6
0.6-0.7
0.7-0.8
0.8-0.9
0.9-1
1-1.1
1.1-1.2
1.2-1.3
1.3-1.4
1.4-1.5
1.5-1.6
1.6-1.7
1.7-1.8
1.8-1.9
>1.9
Concentration (pCi/g)
BRC and COH Background
Tronox Upgradient
Phase A

STATE OF NEVADA
OFFICE OF THE ATTORNEY GENERAL
100 North Carson Street
Carson City, Nevada 89701-4717

CATHERINE CORTEZ MASTO
Attorney General

RANDAL R. MUNN
Assistant Attorney General

August 2, 2007

Pat Corbett, Vice President
Safety and Environmental Affairs
TRONOX, LLC
P.O. Box 268859
Oklahoma City, Oklahoma 73126-8859

Re: *Tronox LLC (TRX)*
NDEP Facility ID #H-000539
Nevada Division of Environmental Division written request for access to TRONOX, LLC (TRX) property in Henderson, Nevada, for investigative work to be completed by Montrose Chemical Corporation of California (Montrose) pursuant to Section X, Site Access of the August 1, 1996, Phase II Consent Agreement

Dear Mr. Corbett:

The August 1, 1996, Phase II Consent Agreement (AOC) between the Nevada Division of Environmental Protection (Division) and Kerr McGee at Section X, Site Access, paragraph 5 requires the Division to make a written request for Site Access to allow another BMI Company to perform investigations at the former Kerr McGee facility. The Division requests that TRX provide access to Montrose to conduct the work specified and approved by the Division in the June 21, 2007, work plan. This work is being performed by Montrose pursuant to a Phase II agreement between Montrose and the Division.

In relevant part Section X, Paragraph 5, states:

> [T]he Company [TRX] shall grant any other BMI Company [Montrose]. . . which is performing Phase II work . . . including its Contractors. . . the authority to enter and move about the Site . . . for the purpose of conducting. . . work required to be performed by such BMI Company pursuant to such other agreement as has been entered between the Division and such BMI Company. . .[G]ranting access may

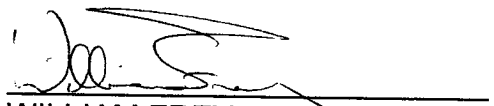
be conditioned upon receiving from any entity seeking such access, written assurances that: such access will be reasonable in scope and will be at the sole risk and expense of the entity seeking access; the BMI Company seeking access will comply with the Company's safety rules and regulations and will have (and make reasonable efforts to ensure its Contractors have) reasonable levels of liability insurance in place and will agree to hold the Company harmless from loss, damage or injury caused by its entry.

The Division expects TRX to comply with Section X within 20 calendar days of the date of this letter.

Please contact me at (775) 684-1229, if you have any questions.

Sincerely,

CATHERINE CORTEZ MASTO
Attorney General

By: 

WILLIAM FREY
Senior Deputy Attorney General
Conservation and Natural Resources
(775) 684-1229

WJF/rmh
By Certified Mail No. 7003 1680 0001 3687 0594
cc: Jim Najima, Chief, NDEP, BCA, Carson City
Maria Skorska, P.E., NDEP, BCA, Las Vegas
Shannon Harbour, P. E., NDEP, BCA, Las Vegas
Brian Rakvica, P. E., Supervisor, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Elizabeth Hurst
Keith Bailey
Susan Crowley
Paul Sundberg
Joe Kelly
Kelly Richardson
Joel Mack
Ashley Green

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

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 30, 2007

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Revised Response to:
Community Involvement Plan
dated April 2, 2007

Dear Ms. Crowley,

The NDEP requests that TRX resubmit the identified document by **August 30, 2007** in response to the following comments by NDEP provided in Attachment A. Please contact the undersigned with any questions at (702) 486-2850 x 240 or sharbour@ndep.nv.gov.

Sincerely,

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

CC: Jim Najima, NDEP, BCA, Carson City
Brian Rakvica, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Keith Bailey, Tronox, Inc, PO Box 268859, Oklahoma City, Oklahoma 73126-8859
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
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
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, CO 80402
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110

Attachment A

1. TRX must include a timeline or schedule for updating of the facility fact sheet. This may be accomplished by adding language for "periodic" updating of the fact sheet.
2. TRX must add language and a schedule for the development of a mailing list for the distribution of fact sheets and other public information documents.
3. TRX must add language stating the TRX is responsible for the costs associated with the production and mailing on any public information documents.

FINAL

Meeting Minutes

Project:	Tronox (TRX)
Location:	Conference Call
Time and Date:	9:00 AM, Wednesday, July 18, 2007
In Attendance:	NDEP-BCA – Brian Rakvica, Shannon Harbour Teri Copeland (for NDEP) Hackenberry Assoc. – Paul Hackenberry (for NDEP) Tronox – Keith Bailey, Susan Crowley ENSR (for TRX) – Dave Gerry, Lisa Bradley, Mike Flack, Sally Bilodeau

CC: Jim Najima, Paul Black, Todd Croft

1. The meeting was held to discuss a variety of topics including the Phase A Report and Phase B Work Plan.
2. TRX provided a number of draft tables and figures for discussion purposes via e-mail.
3. Data validation / usability issues:
    a. NDEP provided BRC table for TRX to review. NDEP noted that this table was created only to address criterion 6 of the Data Quality Indicator (DQI) criteria.
    b. NDEP stated that TRX should be documenting data usability properly throughout the phased characterization process. TRX can track data usability with a formal or informal checklist.
    c. TRX has updated their database with data validation criteria. Only validated data will be reported.
    d. TRX supplied a list of tables that are included in Appendix E of the DVSR addressing data validation and usability.
    e. NDEP suggested that these tables be used to develop a data usability report that contains statements about and explanations for the selection and/or rejection of data. TRX noted that details of the DQIs are included in the validation memos submitted to the NDEP with the DVSR. TRX suggested that NDEP's risk consultant do a brief review of some of the memos. TRX will include a data usability section in the Phase A report.
    f. TRX will refer to the DVSR memos for support in their uncertainty analysis.
4. Dilution attenuation factor, DAF 1 vs. DAF 20:
    a. Table 5-14, TRX added a DAF 1 column and additional analytes (radionuclides).
    b. Table 5-X, summary of detected chemicals with a listing on their respective comparison levels including DAF 1 and DAF 20.
        i. 16 new chemicals were identified as being greater than the comparison level using the DAF 1 versus DAF 20.
        ii. TRX believes that DAF 1 is too conservative for this site and that DAF 20 is also conservative but that a site-specific DAF cannot be calculated due to the sporadic nature of the water pipeline releases at the site.
        iii. NDEP and TRX discussed the exclusion of
            1) Aroclor 1260 due to single detection and low concentration
            2) Uranium should be eliminated in comparison to background

3) Hexachlorobenzene (detected in 6 of 116 samples and only 3 detections above comparison levels) may be eliminated in some areas dependent upon source.
    a) TRX investigating the historical data in the vicinity of the former asphalt plant (near the western boundary of the site). Concentrations of hexachlorobenzene greater than 1 mg/kg were reported historically. No detections of hexachlorobenzene in groundwater have been reported.
    b) TRX did not resample the former Koch asphalt plant area in Phase A.
    c) Hexachlorobenzene was detected historically in the Beta Ditch but was not detected in Phase A sampling of Beta Ditch.
    d) NDEP suggested that TRX use historic data in conjunction with Phase A data to make additional characterization decisions. The NDEP understands that the historic data has not been validated but believes that it should be used to support decisions.
    e) Detection limits for soil analysis have been reported greater than the comparison levels, but less than the PRG. NDEP noted (risk consultant) that in such cases, the data could be considered usable.
    f) It was noted that most of the detected samples had concentrations reported by the lab that were less than the detection limit (J flag). Because the lab could report detections below the detection limit, this decreases the uncertainty in the non-detected results.
    g) It was noted that all of the detection limits for standard SVOC analysis were greater than the comparison level.
    h) NDEP noted that for future sampling TRX may use PAH analysis instead of SVOC SIM analysis. It was noted that the SVOC SIM analysis appeared to provided adequate detection limits; however, there may be a cost difference. While TRX is unsure of using the PAH method, ENSR is investigating addition of hexachlorobenzene to the chlorinated pesticide analytical method

5. Proposed Phase B Sample Locations and Potential Ammonia Source Areas map, figure provided by TRX for discussion purposes.
    a. High concentrations of ammonia in groundwater are coincident with detections in soil.
    b. Paul suggested that the ammonia would be converted to nitrate and nitrite if the environment is aerobic.
    c. TRX stated that there is a bigger nitrate plume coincident with the ammonia detections.
    d. The NDEP noted that there were rejected soil results. [Note – 15 rejections in 116 samples]

e. TRX stated that ammonia was chosen as a simple example so that the NDEP could review the layout of the map and the thought process.
f. TRX pointed out that the ammonia plume was surrounded by wells with non-detects. TRX proposed borings that stepped-out from the source area toward the wells with non-detects for additional characterization of the extent.
g. TRX noted that they may request to use indicator compounds. NDEP noted that this seemed sensible, especially for compound such as ammonia that have very limited toxicity data.

6. Action items from previous conference calls:
   a. 06/28/07: TRX to provide the list of SSLs in a table similar to what NDEP reviewed previously and the reference for the VI levels. **COMPLETED.**
   b. 07/06/07: NDEP to discuss depth of sampling internally and advise TRX. **Completed during call.**
      i. USEPA 2002 Vapor Intrusion (VI) Guidance suggests a 5 ft depth for soil gas sampling for vapor intrusion. NDEP concerned that soil gas results may be biased low at this depth since the source is groundwater and not soil.
      ii. TRX will consider collecting soil gas samples from both 5 ft and 10 ft bgs for comparison from approximately 10% of the proposed borings locations. TRX will check into the costs associated with rapid analysis for the co-located samples so that a decision on which depth to collect the remaining samples can be made.
      iii. NDEP and TRX discussed that the deeper soil gas samples would be collected from areas with higher chemical concentrations in groundwater as well as one or two from areas that are less impacted.
   c. 07/06/07: TRX to find out whether duplicate samples were handled by selecting the maximum concentration or the average concentration of the duplicate samples. **Completed during call.**
      i. Maps: TRX will list all duplicate concentrations
      ii. Tables: TRX will use an average of the duplicate samples
   d. 07/06/07: TRX submitted a list of references used in the development of this table. NDEP requested copies of the references not authored by the EPA. TRX will supply at a minimum, the referenced pages of these sources. **COMPLETED.**
   e. 07/06/07: The NDEP suggested that a DAF = 1 be used in the screening calculations for this initial work. TRX will use DAF = 1 to calculated new screening levels to determine the impact on the number of required analytes. This item will be discussed at or before the next meeting. **COMPLETED.**
   f. 07/06/07: TRX to revise Table 5-20A as necessary prior to next meeting. **Will be completed as part of the process of revising the report.**
   g. 07/06/07: Teri will review this table and discuss hexachlorobenzene and chloroform with ENSR. **This item was discussed as part of this meeting and will be discussed at the next meeting.**
   h. 07/06/07: The NDEP will supply a copy of the Borrow Pit data adequacy protocol to TRX. **NDEP will respond by the next meeting.**

7. Next Meeting: July 25, 2007, 9:00 AM – 5:00 PM PDT at NDEP offices.

a. TRX will provide histograms of Henderson background data set; BRC/TIMET background data set and TRX upgradient data set for discussion. **ACTION ITEM.**
b. TRX will provide maps of various chemicals (in same format as map provided for today's meeting) for discussion on sample location. **ACTION ITEM.**
c. TRX will provide copies of a map of the source areas. **ACTION ITEM.**

Shannon Harbour

From: Brian Rakvica
Sent: Wednesday, July 18, 2007 6:52 AM
To: Shannon Harbour
Subject: FW: FW: NDEP 7-18-07 Presentation Materials
Attachments: DU criteria _FullSum.pdf

From: TeriLCopeland@aol.com [mailto:TeriLCopeland@aol.com]
Sent: Tuesday, July 17, 2007 3:47 PM
To: Brian Rakvica
Subject: Re: FW: NDEP 7-18-07 Presentation Materials

Brian,

I took a look at Lisa's reponse to the DU Issue. I think she may have been mislead by sending her the tables created for BRC (Borrow Plt HRA). Those tables were created to give BRC examples of where they had deficiencies in their data usablity evaluation. As such, they do not cover all the components of data usability, just the ones that were deficient in the Borrow Pit HRA. In fact, the tables created for BRC just deal with DU Criterion VI, Data Quality Indicators (PARCC data sources). Tronox should be aware that they need to document that data used for any application to HRA or risk-based sampling meet the 6 USEPA DU criteria (attached). That includes broad suite analyses, samples at representative source and exposure locations, reporting limits that do not exceed risk-based concentrations, etc. In other words, data validation does not equal data usability evaluation. Perhaps we can clear that up on tomorrow's call.

Teri

In a message dated 7/17/2007 1:17:35 PM Pacific Standard Time, brakvica@ndep.nv.gov writes:

> Brian,
>
> As promised, attached are several files for our discussion tomorrow morning. One additional figure is being revised and will be sent shortly.
>
> Keith

Teri L. Copeland, D.A.B.T.
818) 991-8240
(818) 991-8140 fax
TeriLCopeland@aol.com

Bradley, Lisa

Subject: FW: BMI Borrow Pit - Data Usability Issue

Brian - thank you for this information. We have reviewed your attached spreadsheet, and believe that we have addressed all of these issues in detail in the DVSR. Robert Kennedy has provided me a list of the DVSR tables that specifically provide this information for the Tronox Phase A data - they are:

Table E-1 Data Validation Qualifiers_f.xls
Table E-2 Data Validation Qualifier Reason Codes_f .xls
Table E-3 Sample IDs and Sample Delivery Groups_f.xls
Table E-4 Sample Delivery Groups and Memorandum IDs by Analyte Group_f.xls
Table E-5 Qualifications Based on Holding Time_f.xls
Table E-6 Qualifications Based on Calibration Criteria_f.xls
Table E-7 Qualifications Based on Interference Check Standard_f.xls
Table E-8 Qualifications Based on Serial Dilution Results_f.xls
Table E-9 Qualifications Based on Blank Contamination_f.xls
Table E-10 Qualifications Based on Laboratory Control Sample Results_f.xls
Table E-11 Qualifications Based on Matrix Spike Recoveries_f.xls
Table E-12 Qualifications Based on Surrogate Results_f.xls
Table E-13 Qualifications Based on Internal Standard Areas_f.xls
Table E-14 Qualifications Based on Laboratory Duplicate Precision_f.xls
Table E-15 Qualifications Based on Field Duplicate Precision_f.xls
Table E-16 Qualifications Based on Quantitation Problems_f.xls
Table E-17 Rejected Results_f.xls

As you can see, they are all contained in Appendix E of the DVSR submission. The data validation work, much of which is summarized in these tables, was used as the basis for the addition of the validation qualifiers that have been added to the project database. Note that results which were rejected based on validation were removed from the database, so that *only* data judged useable will be reported and evaluated. Therefore, the database used to generate the Phase A data tables for the report, and ultimately for the risk assessment, has incorporated all of the needed changes to address data usability.

Please let me know if you have any questions, or it you would like me to send you a separate electronic version of Appendix E if that would make your reveiw easier.

From: Brian Rakvica [mailto:brakvica@ndep.nv.gov]
Sent: Friday, July 06, 2007 6:25 PM
To: TeriLCopeland@aol.com; Paul Black; Shannon Harbour; Crowley, Susan; Bailey, Keith
Cc: Gerry, Dave; Perry, Elizabeth; Bradley, Lisa
Subject: FW: BMI Borrow Pit - Data Usability Issue
Importance: High

Here was the original NDEP email.

From: Brian Rakvica
Sent: Thursday, February 15, 2007 7:02 AM
To: 'Ranajit Sahu'; 'Mark K Jones'; rkellogg1@houston.rr.com
Cc: Jim Najima; 'Paul Black'; Teri Copeland; David Gratson
Subject: BMI Borrow Pit - Data Usability Issue
Importance: High

Ranajit,

Attached is the NDEP's review of the data and a fairly detailed example of what is expected for data usability for this human health risk assessment (HHRA) and HHRAs in the future. As we discussed, the level of complexity is site-specific and must be tied to the data set. Decisions and decision rules are also somewhat site-specific. We have tried to be explicit in our logic in this table and the "Summary" tab should provide some useful insight. It is the goal of NDEP to be transparent in our expectations and

comments.

As we discussed, it would be helpful to BRC to resolve this Data Usability (DU) issue prior to re-running the HHRA because it has ramifications that ripple through the HHRA. In general, this will be the expectation of the NDEP in all future HHRAs.

NDEP expects that BRC will review the attached in detail and provide additional inputs and/or modifications as is appropriate. Please do not assume that the attached spreadsheet should be used without a detailed review. Please contact myself, Teri, Paul Black and Dave Gratson with any questions or comments. NDEP looks forward to addressing this issue in an expeditious manner with BRC.

Thanks,

Brian

Brian A. Rakvica, P.E.
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Nevada Division of Environmental Protection
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DRAFT

Table 5-14
Selection of Comparison Levels for Soil for the Soil To Groundwater Migration Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Detected in Soil (h)	USEPA Region 9 PRG-SSL (DAF = 20) (a) (mg/kg)	Selected Groundwater Comparison Level (b) (mg/L)	Soil/Water Partitioning Coefficient (Kd) for Inorganics (c) (L/kg)	Soil/Organic Carbon Partitioning Coefficient (Koc) for Organics (c) (L/kg)	Source of Kd/Koc Data	Henry's Law Constant (K_H) (c) (Unitless)	Source of K_H Data	Site-Specific Soil Screening Level (ssSSL) (DAF = 20) (e) (mg/kg)	Comparison Level (DAF = 20) (f) (mg/kg)	Comparison Level (DAF = 1) (f) (mg/kg)
VOLATILE ORGANIC COMPOUNDS										
1,1,1-Trichloroethane	2.00E+00								2.00E+00	1.00E-01
1,1-Dichloroethane	2.30E+01								2.30E+01	1.15E+00
1,2,3-Trichlorobenzene		7.00E-02	--	2.27E+03	(6, 8)	3.64E-01	(6)	4.68E+00	4.68E+00	2.34E-01
1,2,4-Trichlorobenzene	5.00E+00								5.00E+00	2.50E-01
1,2-Dichlorobenzene	1.70E+01								1.70E+01	8.50E-01
1,2-Dichloroethane	2.00E-02								2.00E-02	1.00E-03
1,3,5-Trimethylbenzene		1.23E-03	--	8.19E+02	(1)	3.16E-01	(1)	3.19E-02	3.19E-02	1.60E-03
1,3-Dichlorobenzene		1.83E-02	--	6.17E+02	(1)	7.79E-02	(1)	3.60E-01	3.60E-01	1.80E-02
1,4-Dichlorobenzene	2.00E+00								2.00E+00	1.00E-01
2-Butanone (MEK)		6.90E+01	--	2.30E+00	(2)	2.29E-03	(2)	1.56E+00	1.56E+00	7.82E-02
2-Chlorotoluene		1.22E-02	--	1.60E+02	(1)	1.44E-01	(1)	8.59E-02	8.59E-02	4.30E-03
2-Hexanone		2.00E-01	--	1.48E+01	(6, 8)	7.16E-02	(6)	5.59E-01	5.59E-01	2.79E-02
Acetone	1.60E+01								1.60E+01	8.00E-01
Benzene	3.00E-02								3.00E-02	1.50E-03
Bromoform	8.00E-01								8.00E-01	4.00E-02
Carbon tetrachloride	7.00E-02								7.00E-02	3.50E-03
Chlorobenzene	1.00E+00								1.00E+00	5.00E-02
Chloroform	6.00E-01								6.00E-01	3.00E-02
Hexachlorobutadiene	2.00E+00								2.00E+00	1.00E-01
Methylene chloride	2.00E-02								2.00E-02	1.00E-03
Tetrachloroethylene (PCE)	6.00E-02								6.00E-02	3.00E-03
Toluene	1.20E+01								1.20E+01	6.00E-01
Trichloroethylene (TCE)	6.00E-02								6.00E-02	3.00E-03
Trichlorofluoromethane		1.29E-01	--	1.60E+02	(1)	3.98E+00	(1)	2.17E+00	2.17E+00	1.09E-01
SEMI-VOLATILE ORGANIC COMPOUNDS										
Benzo(a)anthracene	2.00E+00								2.00E+00	1.00E-01
Benzo(a)pyrene	8.00E+00								8.00E+00	4.00E-01
Benzo(b)fluoranthene	5.00E+00								5.00E+00	2.50E-01
Benzo(g,h,i)perylene		1.83E-02	--	2.80E+06	(5)	5.73E-06	(6)	1.43E+03	1.43E+03	7.17E+01
Benzo(k)fluoranthene	4.90E+01								4.90E+01	2.45E+00
bis(2-Ethylhexyl)phthalate		6.00E-03	--	1.51E+07	(4)	4.18E-06	(4)	2.54E+03	2.54E+03	1.27E+02
Chrysene	1.60E+02								1.60E+02	8.00E+00
Diethyl phthalate		2.92E+00	--	2.88E+02	(4)	1.85E-05	(4)	3.00E+01	3.00E+01	1.50E+00
Di-n-butyl phthalate	2.30E+03								2.30E+03	1.15E+02
Fluoranthene	4.30E+03								4.30E+03	2.15E+02
Hexachlorobenzene	2.00E+00								2.00E+00	1.00E-01
Indeno(1,2,3-cd)pyrene	1.40E+01								1.40E+01	7.00E-01
Naphthalene	8.40E+01								8.40E+01	4.20E+00
Octachlorostyrene		--	--	9.68E+05	(8, 9)	9.41E-03	(8)		--	--
Phenanthrene		1.80E-01	--	3.80E+04	(5)	1.61E-03	(6)	1.92E+02	1.92E+02	9.60E+00
Pyrene	4.20E+03								4.20E+03	2.10E+02

DRAFT

Table 5-14
Selection of Comparison Levels for Soil for the Soil To Groundwater Migration Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Detected in Soil (h)	USEPA Region 9 PRG-SSL (DAF = 20) (a) (mg/kg)	Selected Groundwater Comparison Level (b) (mg/L)	Soil/Water Partitioning Coefficient (Kd) for Inorganics (c) (L/kg)	Soil/Organic Carbon Partitioning Coefficient (Koc) for Organics (c) (L/kg)	Source of Kd/Koc Data	Henry's Law Constant (K_H) (c) (Unitless)	Source of K_H Data	Site-Specific Soil Screening Level (ssSSL) (DAF = 20) (e) (mg/kg)	Comparison Level (DAF = 20) (f) (mg/kg)	Comparison Level (DAF = 1) (f) (mg/kg)
PESTICIDES (OCPs and OPPs) and PCBs										
Beta BHC	3.00E-03								3.00E-03	1.50E-04
4,4'-DDD	1.60E+01								1.60E+01	8.00E-01
4,4'-DDE	5.40E+01								5.40E+01	2.70E+00
4,4'-DDT	3.20E+01								3.20E+01	1.60E+00
Demeton-O		1.46E-04	--	6.31E-02	(8, 9, 10)	1.39E-04	(8, 10)	3.21E-04	3.21E-04	1.60E-05
Dimethoate		7.30E-04	--	1.68E+02	(6, 8)	4.30E-09	(8)	5.03E-03	5.03E-03	2.51E-04
Endrin Aldehyde		1.09E-03	--	3.26E+04	(6, 8)	1.58E-05	(6)	9.97E-01	9.97E-01	4.98E-02
Aroclor-1260		5.00E-04	--	2.91E+05	(8, 9)	1.38E-03	(8)	4.07E+00	4.07E+00	2.03E-01
Methoxychlor	1.60E+02								1.60E+02	8.00E+00
METALS										
Aluminum		5.00E-02	1.50E+03	--	(7)	--		1.50E+03	1.50E+03	7.50E+01
Antimony	5.00E+00								5.00E+00	2.50E-01
Arsenic	2.90E+01								2.90E+01	1.45E+00
Barium	1.60E+03								1.60E+03	8.00E+01
Beryllium	6.30E+01								6.30E+01	3.15E+00
Boron		7.30E-01	3.00E+00	--	(7)	--		4.54E+01	4.54E+01	2.27E+00
Cadmium	8.00E+00								8.00E+00	4.00E-01
Chromium	(g)	1.00E-01	1.80E+06	--	(5)	--		3.60E+06	3.60E+06	1.80E+05
Hexavalent, Chromium	3.80E+01								3.80E+01	1.90E+00
Cobalt		7.30E-02	4.50E+01	--	(7)	--		6.59E+01	6.59E+01	3.29E+00
Copper		1.30E+00	3.60E+02	--	(5)	--		9.36E+03	9.36E+03	4.68E+02
Iron		3.00E-01	2.50E+01	--	(7)	--		1.51E+02	1.51E+02	7.53E+00
Lead		1.50E-02	8.90E+02	--	(5)	--		2.67E+02	2.67E+02	1.34E+01
Manganese		5.00E-02	6.50E+01	--	(7)	--		6.51E+01	6.51E+01	3.26E+00
Molybdenum		1.82E-02	2.00E+01	--	(7)	--		7.32E+00	7.32E+00	3.66E-01
Mercury		2.00E-03	8.20E+01	--	(4)	--		3.28E+00	3.28E+00	1.64E-01
Nickel	1.30E+02								1.30E+02	6.50E+00
Platinum		--	9.00E+01	--	(7)	--		--	--	--
Silver	3.40E+01								3.40E+01	1.70E+00
Strontium		2.19E+00	3.50E+01	--	(7)	--		1.54E+03	1.54E+03	7.69E+01
Thallium		2.00E-03	7.10E+01	--	(5)	--		2.84E+00	2.84E+00	1.42E-01
Tin		2.19E+00	2.50E+02	--	(7)	--		1.10E+04	1.10E+04	5.48E+02
Titanium		1.46E+01	1.00E+03	--	(7)	--		2.92E+05	2.92E+05	1.46E+04
Tungsten		--	1.50E+02	--	(7)	--		--	--	--
Uranium		3.00E-02	4.00E-01	--	(3)	--		3.06E-01	3.06E-01	1.53E-02
Vanadium	6.00E+03								6.00E+03	3.00E+02
Zinc	1.20E+04								1.20E+04	6.00E+02
RAD										
Radium-226	--	5.10E-09	4.50E+02		(7)	--		4.59E-05	4.59E-05	2.30E-06
Radium-228	--	1.80E-11	4.50E+02		(7)	--		1.62E-07	1.62E-07	8.10E-09
Thorium-228	--	1.80E-11	2.00E+01		(3)	--		7.24E-09	7.24E-09	3.62E-10
Thorium-230	--	7.40E-07	2.00E+01		(3)	--		2.98E-04	2.98E-04	1.49E-05
Thorium 232	--	1.40E-01	2.00E+01		(3)	--		5.63E+01	5.63E+01	2.82E+00
Uranium 233/234	--	3.00E-02	4.00E-01		(3)	--		3.06E-01	3.06E-01	1.53E-02
Uranium 235/236	--	3.00E-02	4.00E-01		(3)	--		3.06E-01	3.06E-01	1.53E-02
Uranium 238	--	3.00E-02	4.00E-01		(3)	--		3.06E-01	3.06E-01	1.53E-02

Table 5-14
Selection of Comparison Levels for Soil for the Soil To Groundwater Migration Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Detected in Soil (h)	USEPA Region 9 PRG-SSL (DAF = 20) (a) (mg/kg)	Selected Groundwater Comparison Level (b) (mg/L)	Soil/Water Partitioning Coefficient (Kd) for Inorganics (c) (L/kg)	Soil/Organic Carbon Partitioning Coefficient (Koc) for Organics (c) (L/kg)	Source of Kd/Koc Data	Henry's Law Constant (K_H) (c) (Unitless)	Source of K_H Data	Site-Specific Soil Screening Level (ssSSL) (DAF = 20) (e) (mg/kg)	Comparison Level (DAF = 20) (f) (mg/kg)	Comparison Level (DAF = 1) (f) (mg/kg)

DEFINITIONS
PRG-SSL: Preliminary Remediation Goal (USEPA, 2004a) Soil Screening Level for the migration to groundwater pathway
Kd: Soil-water Partitioning Coefficient
Koc: Soil-organic carbon Partitioning Coefficient
DAF: Dilution Attenuation Factor
ssSSL: Calculated site-specific soil screening level
-- Value not available/not applicable.

NOTES
Calculations were not performed for radionuclides, because results are activities that do not have fate and transport properties.
Due to their low solubility, dioxins and furans are not expected to migrate to groundwater.
The soil to groundwater pathway is assumed to be complete for infinitely soluble constituents (e.g., perchlorate, chloride, sodium, nitrate, sulfate, calcium).

FOOTNOTES
(a) Preliminary Remediation Goals are those provided by USEPA (2004a) for migration to groundwater with a DAF of 20.
(b) Comparison Levels are presented in Table 5-1. Concentrations for radionuclides converted from activities per USEPA (2000).
(c) Chemical properties were selected from the following sources, in order of priority:
(1) USEPA (2004a).
(2) USEPA (2004c).
(3) USEPA (2000)
(4) USEPA (1996).
(5) PADEP (2007).
(6) USEPA (1992).
(7) ORNL (1985).
(8) Howard & Meylan (1997).
(9) Estimated from referenced Kow, per USEPA (1996). Appendix K.
(10) Demeton used as surrogate. Kow estimated from Koc, based on LFER for misc. pesticides in Table 7.2 of Schwarzenbach et al. (1993).
(e) Values calculated per text. See Section 5.5.2.
(f) Comparison level is the PRG-SSL; where a PRG-SSL is unavailable, the ssSSL was used
(g) Site-specific SSL calculated for total chromium assuming trivalent chromium (PRG-SSL used for hexavalent chromium).
(h) Calculations were not performed for petroleum hydrocarbons and other constituents for which there is no comparison value for groundwater.

Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
Chemistry											
EPA 310.1											
Alkalinity (as CaCO3)	Alk as CaCO3	mg/kg	74 : 116 : 116	4.84E+01	1.44E+03	1.65E+02	SA14		Include		Include
Bicarbonate Alkalinity	71-52-3	mg/kg	113 : 116 : 116	7.29E+01	8.36E+03	6.85E+02	SA25		Include		Include
Total Alkalinity	T-ALK	mg/kg	116 : 116 : 116	7.44E+01	8.86E+03	8.46E+02	SA25		Include		Include
EPA 350.1											
Ammonia (as N)	7664-41-7	mg/kg	10 : 103 : 102	8.00E-01	9.28E+02	2.27E+01	SA15		Include		Include
SM 5540C											
MBAS	MBAS	mg/kg	21 : 116 : 116	1.63E+00	5.90E+00	2.13E+00	SA08		Exclude		Exclude
SW 846 9056											
Bromide	24959-67-9	mg/kg	18 : 116 : 116	9.50E-01	9.20E+01	4.10E+00	SA04		Exclude		Exclude
Chlorate	14866-68-3	mg/kg	58 : 114 : 114	1.40E+00	1.37E+03	6.70E+01	SA11		Include		Include
Chloride	16887-00-6	mg/kg	113 : 116 : 116	9.50E-01	5.60E+03	3.77E+02	SA05		Include		Include
Nitrate	NO3	mg/kg	107 : 116 : 116	1.70E-01	2.79E+02	8.97E+00	SA15		Include		Include
Nitrite	14797-65-0	mg/kg	62 : 109 : 109	4.70E-02	2.13E+01	2.15E+00	SA14		Include		Include
ortho-Phosphate	o-PO4	mg/kg	62 : 116 : 116	1.20E+00	8.89E+03	2.15E+02	SA05		Include		Include
Sulfate	14808-79-8	mg/kg	116 : 116 : 116	5.40E+00	1.51E+04	1.31E+03	SA08		Include		Include
SW 846 9060											
Total Organic Carbon	TOC	mg/kg	116 : 116 : 116	2.00E+02	3.86E+04	8.04E+03	SA15		Exclude		Exclude
DIOXINS											
8290 SCREEN											
Total TEQ - ENSR Calculated	TTEQ-b	ng/kg	27 : 27 : 27	6.30E-02	1.15E+03	1.32E+02	SA16		Exclude		Exclude
SW 846 8290											
Total TEQ - ENSR Calculated	TTEQ-b	ng/kg	7 : 7 : 7	8.20E-01	8.94E+02	3.83E+02	SA16		Exclude		Exclude
Metals											
SW 846 6020											

C - Calc.

Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
Aluminum	7429-90-5	mg/kg	116 : 116 : 116	3.68E+03	1.88E+04	7.83E+03	SA09	7.50E+01 C	YES	1.50E+03	YES
Antimony	7440-36-0	mg/kg	115 : 116 : 116	8.00E-02	6.50E+00	2.23E-01	SA09	3.00 ~~2.50E-01~~	YES	5.00E+00	YES
Arsenic	7440-38-2	mg/kg	116 : 116 : 116	1.60E+00	6.16E+01	9.64E+00	SA03	1.00 ~~1.45E+00~~	YES	2.90E+01	YES
Barium	7440-39-3	mg/kg	116 : 116 : 116	2.52E+01	1.20E+03	1.55E+02	SA09	8.20 ~~8.00E+01~~	YES	1.60E+03	NO
Beryllium	7440-41-7	mg/kg	116 : 116 : 116	2.00E-01	9.80E-01	4.83E-01	SA12	3.00 ~~3.45E+00~~	NO	6.30E+01	NO
Boron	7440-42-8	mg/kg	44 : 116 : 116	2.50E+00	4.86E+01	7.91E+00	SA07	2.27E+00 C	YES	4.54E+01	YES
Cadmium	7440-43-9	mg/kg	115 : 116 : 116	2.20E-02	1.70E+00	1.09E-01	SA15	~~4.00E-01~~	YES	8.00E+00	NO
Calcium	7440-70-2	mg/kg	109 : 116 : 116	2.17E+03	1.87E+05	2.94E+04	SA14	2.00E+00	Include	3.80E+01	Include
Chromium	7440-47-3	mg/kg	116 : 116 : 116	4.70E+00	6.33E+01	1.37E+01	SA17	~~1.80E+05~~	~~NO~~ yes	~~3.60E+06~~	~~NO~~ yes ? how was this calc?
Cobalt	7440-48-4	mg/kg	116 : 116 : 116	2.40E+00	1.20E+01	5.67E+00	SA17	3.29E+00 C	YES	6.59E+01	NO
Copper	7440-50-8	mg/kg	115 : 116 : 116	5.80E+00	1.99E+02	1.36E+01	SA17	4.68E+02 C	NO	9.36E+03	NO
Iron	7439-89-6	mg/kg	116 : 116 : 116	4.89E+03	2.03E+04	1.12E+04	SA10	7.53E+00 C	YES	1.51E+02	YES
Lead	7439-92-1	mg/kg	116 : 116 : 116	4.00E+00	3.05E+02	1.17E+01	SA09	1.34E+01 C	YES	2.67E+02	YES
Magnesium	7439-95-4	mg/kg	112 : 116 : 116	3.97E+03	6.37E+04	1.34E+04	SA16		Include		Include
Manganese	7439-96-5	mg/kg	116 : 116 : 116	5.88E+01	6.66E+03	3.48E+02	SA09	3.26E+00 C	YES	6.51E+01	YES
Molybdenum	7439-98-7	mg/kg	107 : 116 : 116	2.80E-01	5.30E+00	6.09E-01	SA09	3.66E-01 C	YES	7.32E+00	NO
Nickel	7440-02-0	mg/kg	116 : 116 : 116	5.20E+00	3.04E+01	1.27E+01	SA09	7.00 ~~6.50E+00~~	YES	1.30E+02	NO
Platinum	7440-06-4	mg/kg	72 : 116 : 116	9.00E-03	7.70E-02	1.35E-02	SA07		Exclude		Exclude ← explain why excl. of (ref. note?)
Potassium	7440-09-7	mg/kg	109 : 116 : 116	9.80E+02	5.21E+03	1.94E+03	SA25		Include		Include
Silver	7440-22-4	mg/kg	115 : 116 : 116	6.10E-02	4.80E-01	1.37E-01	SA17	2.00 ~~1.70E+00~~	NO	3.40E+01	NO
Sodium	7440-23-5	mg/kg	104 : 116 : 116	2.14E+02	4.91E+03	1.02E+03	SA14		Include		Include
Strontium	7440-24-6	mg/kg	111 : 116 : 116	4.61E+01	2.28E+03	2.35E+02	SA07	7.69E+01 C	YES	1.54E+03	YES
Thallium	7440-28-0	mg/kg	49 : 116 : 116	6.80E-02	2.90E+00	1.20E-01	SA09	1.42E-01 C	YES	2.84E+00	YES
Tin	7440-31-5	mg/kg	112 : 116 : 116	2.70E-01	1.20E+00	5.13E-01	SA08	5.48E+02 C	NO	1.10E+04	NO
Titanium	7440-32-6	mg/kg	116 : 116 : 116	2.52E+02	8.18E+02	4.79E+02	SA13	1.46E+04 C	NO	2.92E+05	NO
Tungsten	7440-33-7	mg/kg	75 : 116 : 116	1.50E-01	1.15E+01	5.61E-01	SA17		Exclude		Exclude
Uranium	7440-61-1	mg/kg	114 : 116 : 116	6.80E-01	1.06E+01	1.99E+00	SA03	1.53E-02 C	YES	3.06E-01	YES
Vanadium	7440-62-2	mg/kg	116 : 116 : 116	1.37E+01	5.63E+01	3.12E+01	SA13	3.00E+02	NO	6.00E+03	NO
Zinc	7440-66-6	mg/kg	106 : 116 : 116	1.49E+01	1.79E+02	2.76E+01	SA17	6.20 ~~6.00E+02~~	NO	1.20E+04	NO
SW 846 7199											
CR, Hexavalent	18540-29-9	mg/kg	40 : 116 : 116	1.08E-01	1.18E+01	5.69E-01	SA11	2.00 ~~1.90E+00~~	YES	3.80E+01	NO

Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
SW 846 7471											
Mercury	7439-97-6	mg/kg	27 : 115 : 116	7.28E-03	2.60E-02	6.34E-03	SA11	1.64E-01 C	NO	3.28E+00	NO
O. Pesticides											
SW 846 8141A											
Demeton-O	298-03-3	mg/kg	1 : 28 : 28	5.75E-02	5.75E-02	2.30E-02	SA17	1.60E-05 C	YES	3.21E-04	YES
Dimethoate	60-51-5	mg/kg	2 : 27 : 28	1.15E-02	1.30E-02	1.21E-02	SA05	2.51E-04 C	YES	5.03E-03	YES
PCB											
SW 846 8082											
Aroclor-1260	11096-82-5	mg/kg	1 : 116 : 116	4.70E-01	4.70E-01	2.33E-02	SA09	2.03E-01 C	YES	4.07E+00	NO
Perchlorate											
EPA 314.0											
Perchlorate	14797-73-0	mg/kg	111 : 116 : 116	2.89E-02	2.33E+03	8.21E+01	SA15		Include		Include
Pesticide											
SW 846 8081											
4,4-DDD	72-54-8	mg/kg	2 : 30 : 30	6.90E-03	2.70E-02	2.75E-03	SA09	8.00E-01	NO	1.60E+01	NO
4,4-DDE	72-55-9	mg/kg	8 : 30 : 30	1.45E-03	6.20E-01	4.11E-02	SA09	3.00~~2.70E~~+00	NO	5.40E+01	NO
4,4-DDT	50-29-3	mg/kg	7 : 30 : 30	1.50E-03	6.60E-01	3.08E-02	SA14	2.00~~1.60E~~+00	NO	3.20E+01	NO
Beta-BHC	319-85-7	mg/kg	14 : 30 : 30	1.80E-03	1.30E+00	5.13E-02	SA09	1.00 ~~1.50E~~-04	YES	3.00E-03	YES
Endrin Aldehyde ?	7421-93-4	mg/kg	2 : 30 : 30	1.70E-02	3.80E-02	3.46E-03	SA14	5.00~~4.98E~~-02	NO 1.00E+00	~~9.97E-01~~	NO
Methoxychlor	72-43-5	mg/kg	4 : 30 : 30	4.75E-03	5.00E-02	5.45E-03	SA17	8.00E+00	NO	~~1.60E+02~~	NO
RAD											
HASL-300 gamma											
Ra-226	Ra-226	pci/g	114 : 116 : 116	8.69E-01	7.49E+00	1.47E+00	SA07	2.30E-06	YES	4.59E-05	YES
Ra-228	Ra-228	pci/g	109 : 116 : 116	6.76E-01	2.11E+00	1.60E+00	SA15	8.10E-09	YES	1.62E-07	YES
HASL-300 TH MOD											

Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
Th-228	Th-228	pci/g	12 : 12 : 12	4.81E-01	1.12E+00	7.00E-01	SA02	3.62E-10	YES	7.24E-09	YES
Th-230	Th-230	pci/g	12 : 12 : 12	4.16E-01	2.23E+00	8.18E-01	SA05	1.49E-05	YES	2.98E-04	YES
Th-232	Th-232	pci/g	12 : 12 : 12	5.39E-01	9.94E-01	6.98E-01	SA02	2.82E+00	NO	5.63E+01	NO
HASL-300 U MOD											
URANIUM-233/234	U-234 SOL	pci/g	12 : 12 : 12	2.60E-01	1.58E+00	6.87E-01	SA05	1.53E-02	YES	3.06E-01	YES
URANIUM-235/236	U-235 SOL	pci/g	6 : 12 : 12	7.27E-03	4.69E-02	1.50E-02	SA05	1.53E-02	YES	3.06E-01	NO
URANIUM-238	U-238 SOL	pci/g	12 : 12 : 12	1.42E-01	1.37E+00	4.92E-01	SA05	1.53E-02	YES	3.06E-01	YES
SVOC											
SW 846 8260											
Naphthalene	91-20-3	mg/kg	1 : 1 : 116	7.90E-04	7.90E-04	7.90E-04	SA08	4.00 4.20E+00	NO	8.40E+01	NO
SW 846 8270								8.00E-02	Yes		
Benz(a)anthracene	56-55-3	mg/kg	2 : 2 : 116	4.00E-02	9.00E-02	6.50E-02	SA09	1.00E-01	NO	2.00E+00	NO
Benzo(a)pyrene	50-32-8	mg/kg	2 : 2 : 116	4.50E-02	7.90E-02	6.20E-02	SA09	4.00E-01	NO	8.00E+00	NO
Benzo(b)fluoranthene	205-99-2	mg/kg	2 : 2 : 116	7.70E-02	1.10E-01	9.35E-02	SA09	2.00 2.50E-01	NO	5.00E+00	NO
Benzo(g,h,i)perylene	191-24-2	mg/kg	2 : 2 : 116	4.80E-02	6.90E-02	5.85E-02	SA09	7.17E+01	NO	1.43E+03	NO
Benzo(k)fluoranthene	207-08-9	mg/kg	2 : 2 : 116	4.90E-02	1.10E-01	7.95E-02	SA09	2.00 2.45E+00	NO	4.90E+01	NO
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg	6 : 116 : 116	5.10E-02	3.00E-01	1.93E-01	SA11	1.27E+02	NO	2.54E+03	NO
Chrysene	218-01-9	mg/kg	2 : 2 : 116	7.10E-02	1.30E-01	1.01E-01	SA09	8.00E+00	NO	1.60E+02	NO
Diethyl phthalate	84-66-2	mg/kg	2 : 110 : 116	1.50E-01	2.60E-01	1.90E-01	SA14	1.50E+00 C	NO	3.00E+01	NO
Di-N-Butyl phthalate	84-74-2	mg/kg	1 : 116 : 116	4.22E-01	4.22E-01	1.97E-01	SA15	2.7 1.15E+02	NO	2.30E+03	NO
Fluoranthene	206-44-0	mg/kg	2 : 57 : 116	8.50E-02	1.80E-01	1.76E-01	SA09	2.10 2.15E+02	NO	4.30E+03	NO
Hexachlorobenzene	118-74-1	mg/kg	6 : 116 : 116	5.30E-02	5.75E-01	1.96E-01	SA11	1.00E-01	YES	2.00E+00	NO
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	1 : 1 : 116	6.20E-02	6.20E-02	6.20E-02	SA09	7.00E-01	NO	1.40E+01	NO
Octachlorostyrene	29082-74-4	mg/kg	2 : 95 : 116	1.30E-01	2.00E-01	1.84E-01	SA11		Exclude		Exclude
Phenanthrene	85-01-8	mg/kg	1 : 1 : 116	5.90E-02	5.90E-02	5.90E-02	SA09	9.60E+00	NO	1.92E+02	NO
Pyrene	129-00-0	mg/kg	2 : 2 : 116	7.80E-02	1.60E-01	1.19E-01	SA09	2.10E+02	NO	4.20E+03	NO
SW 846 8270 SIM											
Benz(a)anthracene	56-55-3	mg/kg	1 : 13 : 13	1.20E-02	1.20E-02	4.29E-03	SA09	8.00E-02 1.00E-01	NO	2.00E+00	NO
Benzo(a)pyrene	50-32-8	mg/kg	1 : 13 : 13	1.30E-02	1.30E-02	4.37E-03	SA09	4.00E-01	NO	8.00E+00	NO

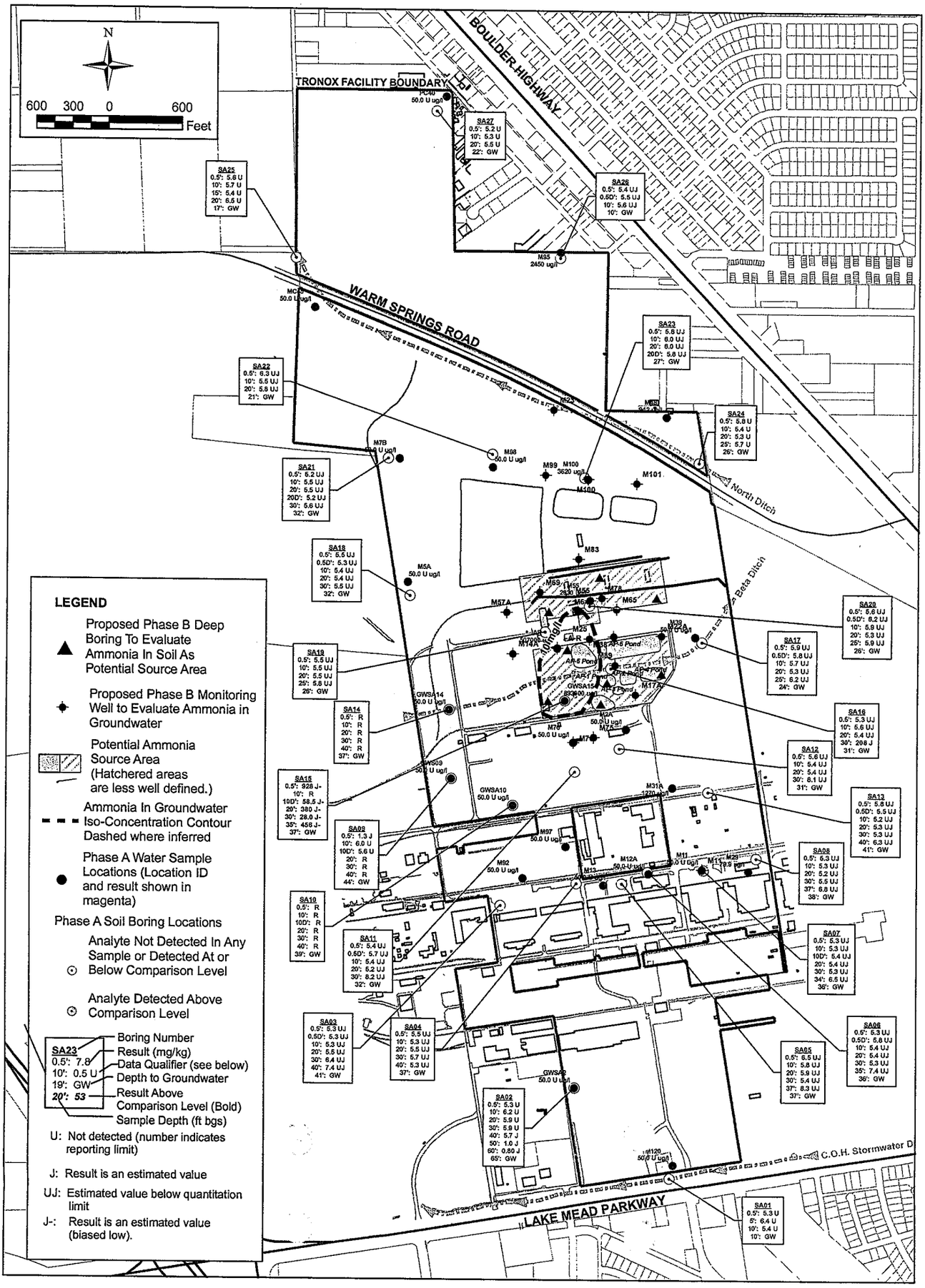
Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
Benzo(b)fluoranthene	205-99-2	mg/kg	1 : 13 : 13	2.20E-02	2.20E-02	5.06E-03	SA09	2.50E-01	NO	5.00E+00	NO
Benzo(g,h,i)perylene	191-24-2	mg/kg	1 : 13 : 13	2.30E-02	2.30E-02	5.13E-03	SA09	7.17E+01	NO	1.43E+03	NO
Benzo(k)fluoranthene	207-08-9	mg/kg	1 : 13 : 13	1.60E-02	1.60E-02	4.60E-03	SA09	2.45E+00	NO	4.90E+01	NO
Chrysene	218-01-9	mg/kg	2 : 13 : 13	7.00E-03	2.40E-02	5.48E-03	SA09	8.00E+00	NO	1.60E+02	NO
Fluoranthene	206-44-0	mg/kg	2 : 13 : 13	1.70E-02	2.70E-02	6.48E-03	SA08	2.10 ~~2.15E~~+02	NO	4.30E+03	NO
Hexachlorobenzene	118-74-1	mg/kg	7 : 13 : 13	6.77E-03	7.70E-02	1.80E-02	SA14	1.00E-01	NO	2.00E+00	NO
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	1 : 13 : 13	1.90E-02	1.90E-02	4.83E-03	SA09	7.00E-01	NO	1.40E+01	NO
Phenanthrene	85-01-8	mg/kg	1 : 13 : 13	1.00E-02	1.00E-02	4.13E-03	SA09	9.60E+00?	NO	1.92E+02	NO
Pyrene	129-00-0	mg/kg	3 : 13 : 13	5.25E-03	2.30E-02	5.93E-03	SA09	2.10E+02	NO	4.20E+03	NO
TPH											
SW 846 8015B DRO					101						
Oil Range Organics	TPH-MOTOR	mg/kg	6 : 86 : 87	4.00E+00	1.01E+02	1.65E+01	SA26		Exclude		Exclude
Total petroleum hydrocarbon-diesel	TPH-diesel	mg/kg	2 : 87 : 87	5.10E+00	3.60E+03	5.61E+01	SA08		Exclude		Exclude
SW 846 8015B GRO					3.2E+00						
Total petroleum hydrocarbon-gasoline	TPH-gasoline	mg/kg	4 : 87 : 87	1.30E-01	3.20E+00	1.36E-01	SA09		Exclude		Exclude
VOC											
SW 846 8260											
1,1,1-Trichloroethane	71-55-6	mg/kg	4 : 4 : 116	3.70E-04	9.50E-04	5.97E-04	SA08	1.00E-01	NO	2.00E+00	NO
1,1-Dichloroethane	75-34-3	mg/kg	7 : 116 : 116	1.40E-03	1.10E-02	2.99E-03	SA25	1.00 ~~1.15E+00~~	NO	2.30E+01	NO
1,2,3-Trichlorobenzene	87-61-6	mg/kg	8 : 116 : 116	1.20E-03	1.40E+00	1.51E-02	SA14	? 2.34E-01?	YES	4.68E+00	NO
1,2,4-Trichlorobenzene	120-82-1	mg/kg	7 : 116 : 116	1.70E-03	1.50E+00	1.61E-02	SA14	3.00 ~~2.50E~~-01	YES	5.00E+00	NO
1,2-Dichlorobenzene	95-50-1	mg/kg	10 : 116 : 116	2.90E-04	1.80E-01	5.66E-03	SA09	9.00 ~~8.50E~~-01	NO	1.70E+01	NO
1,2-Dichloroethane	107-06-2	mg/kg	2 : 97 : 116	1.90E-03	3.20E-03	2.79E-03	SA19	1.00E-03	YES	2.00E-02	NO
1,3,5-Trimethylbenzene	108-67-8	mg/kg	1 : 1 : 116	3.00E-04	3.00E-04	3.00E-04	SA20	1.60E-03 C	NO	3.19E-02	NO
1,3-Dichlorobenzene	541-73-1	mg/kg	2 : 116 : 116	1.40E-02	1.50E-02	3.14E-03	SA14	1.80E-02 C	NO	3.60E-01	NO
1,4-Dichlorobenzene	106-46-7	mg/kg	29 : 116 : 116	1.20E-04	7.60E-01	1.19E-02	SA09	1.00E-01	YES	2.00E+00	NO
2-Butanone MEK	78-93-3	mg/kg	8 : 116 : 116	1.70E-03	3.80E-02	6.28E-03	SA08	7.82E-02 C	NO	1.56E+00	NO
2-Chlorotoluene	95-49-8	mg/kg	1 : 1 : 116	8.30E-04	8.30E-04	8.30E-04	SA25	4.30E-03 C	NO	8.59E-02	NO
2-Hexanone	591-78-6	mg/kg	1 : 1 : 116	3.80E-03	3.80E-03	3.80E-03	SA08	2.79E-02 C	NO	5.59E-01	NO

Table 5-X (DAF = 1 and DAF = 20)
Comparison of Detected SRCs in Soil to Comparison Levels for the Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/Analytical Method SRC (a)	CAS	Units	FOD (b)	Minimum Detected Concentration (c)	Maximum Detected Concentration (d)	Mean Concentration (e)	Location of Maximum Detected Concentration	Comparison Level (DAF = 1) (f)	Max Exceeds Comparison Level (DAF = 1)?	Comparison Level (DAF = 20) (f)	Max Exceeds Comparison Level (DAF = 20)?
Acetone	67-64-1	mg/kg	23 : 116 : 116	4.30E-03	2.50E-01	1.23E-02	SA08	8.00E-01	NO	1.60E+01	NO
Benzene	71-43-2	mg/kg	12 : 116 : 116	1.90E-04	4.10E+00	6.07E-02	SA09	2.80E-03	YES	3.00E-02	YES
Bromoform	75-25-2	mg/kg	1 : 1 : 116	9.30E-04	9.30E-04	9.30E-04	SA11	4.00E-02	NO	8.00E-01	NO
Carbon tetrachloride	56-23-5	mg/kg	4 : 116 : 116	2.30E-03	1.60E-02	3.16E-03	SA09	3.00E-03	YES	7.00E-02	NO
Chlorobenzene	108-90-7	mg/kg	12 : 116 : 116	8.00E-04	1.20E+01	1.76E-01	SA09	7.00E-02	YES	1.00E+00	YES
Chloroform	67-66-3	mg/kg	52 : 116 : 116	1.80E-04	6.80E+00	1.53E-01	SA14	3.00E-02	YES	6.00E-01	YES
Hexachlorobutadiene	87-68-3	mg/kg	5 : 116 : 116	3.80E-04	1.10E-02	2.97E-03	SA14	1.00E-01	NO	2.00E+00	NO
Methylene chloride	75-09-2	mg/kg	5 : 116 : 116	3.80E-03	4.00E-02	3.50E-03	SA21	1.00E-03	YES	2.00E-02	YES
Tetrachloroethene	127-18-4	mg/kg	7 : 116 : 116	6.60E-04	8.10E-03	2.89E-03	SA09	3.00E-03	YES	6.00E-02	NO
Toluene	108-88-3	mg/kg	15 : 15 : 116	2.50E-04	8.20E-04	4.28E-04	SA08	6.00E-01	NO	1.20E+01	NO
Trichloroethene	79-01-6	mg/kg	7 : 116 : 116	1.10E-03	8.80E-03	3.01E-03	SA16	3.00E-03	YES	6.00E-02	NO
Trichlorofluoromethane	75-69-4	mg/kg	3 : 116 : 116	1.20E-03	1.40E-02	3.01E-03	SA09	1.09E-01	NO	2.17E+00	NO

Notes:
CAS - Chemical Abstracts Service number or other identifier.
DAF - Dilution Attenuation Factor.
SRC - Site-Related Chemical.
TEQ - Toxic Equivalent. Total TEQs calculated by ENSR assuming a value of 1/2 the detection limit for non detected results and using the 2006 toxic equivalency factors (van den Berg, et al. 2006).
(a) Only chemicals with at least one positively detected result are reported.
(b) Frequency of detection - Number of detected samples: Number of samples used to calculate statistics: Number of total samples.
(c) Minimum detected concentration for each chemical, after duplicates have been averaged.
(d) Maximum detected concentration for each chemical, after duplicates have been averaged.
(e) Arithmetic mean concentration for each chemical, after duplicates have been averaged and any non detected results with a sample quantitation limit greater than the maximum detected concentration have been excluded.
(f) See Table 5-14 for comparison levels, as well as references, footnotes and synonyms.



SHEET NUMBER:	FIGURE NUMBER:
X	X

PROPOSED PHASE B SAMPLE LOCATIONS AND POTENTIAL AMMONIA SOURCE AREAS
SOURCE AREA INVESTIGATION
PHASE A
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	7/17/07	04020-023-402

ENSR | AECOM
ENSR CORPORATION
1220 AVENIDA ACASO
CAMARILLO, CALIFORNIA 93012
PHONE: (805) 388-3775
FAX: (805) 388-3577
WEB: HTTP://WWW.ENSR.AECOM.COM

DESIGNED BY:	REVISIONS:			
X	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
X				
CHECKED BY:				
X				
APPROVED BY:				
X				

TRONOX

Susan Crowley
Staff Environmental Specialist

(702) 651-2234
fax (405) 302-4607
susan.crowley@tronox.com

July 17, 2007

Mr. Brian Rakvica, P.E.
Nevada Division of Environmental Protection
1771 East Flamingo Road, Suite 121-A
Las Vegas, Nevada 89119

Dear Mr. Rakvica:

Subject: Tronox LLC ECA Quarterly Report – Second Quarter 2007

Pursuant to Section XIII of the Consent Agreement, signed September 5, 1996, between Nevada Division of Environmental Protection (NDEP) and Tronox LLC (Tronox), we submit the following quarterly status report for the Henderson facility's Environmental Conditions Assessment (ECA).

Activities Conducted, 04-01-07 to 06-30-07

Conceptual Site Model:

- CSM remains unchanged until additional data justifies revisions

Upgradient Investigation Results:

- March 23 – NDEP transmits comments to Tronox (no response date specified). Tronox plans to complete response to comments after submitting the Phase A Report.

Phase A - Source Area Investigation

- April – June – Data analyses and validation are complete. Report preparations are underway.
- April 5 – Tronox and ENSR met with NDEP to discuss findings of the Phase A Source Area Investigation, and to discuss proposed approaches to the Phase B scope of work. Based on risk evaluation a proposed list of SRCs to carry forward into the Phase B investigation are proposed and under discussion. Further, ENSR and Tronox discussed methods of identifying comparison levels for chemicals carried into the Phase B investigation, and procedures for evaluating the adequacy of characterization. In addition, Tronox agreed to resample 21 monitoring wells to evaluate potential analytical bias due to turbidity in comparative sampling methods.
- May 1 – Submitted Workplan for sampling the 21 monitoring wells to NDEP.
- May 2 – May11 – ENSR conducts field work to re-sample 21 monitoring wells.
- May 8 – Telecon with NDEP
- May 30 – Tronox submits validated Phase A data, data validation memos and DVSRs to NDEP
- June 6 – Telecon with NDEP

QAPP and SOPs:

- April - June – Project-wide QAPP is in preparation, as well as Tronox-specific SOPs based on NDEP-approved BRC SOPs.

Community Involvement Plan

- April 2 - Tronox responds to comments and submits a revised Community Involvement Plan (CIP) to NDEP.

Groundwater Capture Evaluation Work Plan

- May 30 – Submit Groundwater Capture Evaluation Work Plan as part of the Response to NDEP Comments on the Tronox Semi-annual Performance Report dated February 28, 2007.
- June 26 – NDEP submits to Tronox comments on the Groundwater Capture Evaluation Work Plan, and requests that responses be submitted by July 31, 2007.

Other

- April 15 – Tronox issued 1st Quarter - 2007 ECA Status Report to NDEP.
- May 29 – Tronox submits 1st Quarter – 2007 *Quarterly Performance Report – Perchlorate Recovery System* to NDEP.
- June – Tronox begins assembly of the *2007 Annual Performance Report for Chromium and Perchlorate.*
- June 21 – ENSR provides relational database of Phase A data in Access format to Tronox

Please note that the Tronox ECA *"Deliverable Schedule"* is attached. Feel free to call me at (702) 651-2234, if you have any questions. Thank you.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

Overnight Mail

Cc: See attached document distribution list

Attachment: ECA Deliverable Schedule

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Doc Distribution

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Deliverable Schedule

Tronox Document Distribution List Updated: 2-Apr-07

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Sous	Nadir	NDEP			
Tinney	Al	NDEP	X		
Palm	Jon	NDEP	X		
Rakvica	Brian	NDEP	X		
Pohlmann	Brenda	COH	X		
Conaty	Barry	COH Counsel	X		
Durr	Paul	DAQEM			
Hunsaker	Ross	DAQEM			
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Hurst	Elizabeth	Tronox Counsel	X		
Stater	Rick	Tronox	X		
Crowley	Susan	Tronox	X		
Krish	Ed	ENSR	X		
Bilodeau	Sally	ENSR	X		
Gerry	Dave	ENSR	X		
Lambeth	Jeff	Veolia			
McDaniel	Tom	Veolia			
Cheung	Mary	Veolia			
Guerriero	Joe	AIG	X		
Giroux	Barry	GEI	X		
Stowers	Kirk	Broadbent ERM			
Sahu	Rahnijit	BMI	X		
Crouse	George	Syngenta	X		
Erickson	Lee	Stauffer	X		
Kelly	Joe	Montrose			
Sundberg	Paul	Montrose	X		
Gibson	Jeff	AmPac			
Sylvia	Chris	Pioneer	X		
Wilkinson	Craig	Timet	X		
Mack	Joel	Montrose Counsel			

ENVIRONMENTAL CONDITIONS ASSESSMENT - DELIVERABLE SCHEDULE
Tronox LLC - Henderson, Nevada
Revised: July 13, 2007

Deliverable	Date
Conceptual Site Model	February 28, 2005 – Submitted
* KM Response to NDEP May 6, 2005 Comments	August 31, 2005 – Submitted
* KM Response to NDEP September 6, 2005 comments	October 14, 2005 – Submitted
	Further revisions will be completed as needed following additional data collection activities
Source Area Evaluation (SAE)	September 30, 2005 – Conceptual approach submitted.
* Phase A Work Plan	October 3, 2005 – NDEP approved conceptual approach
	October 21, 2005 – Workplan schedule submitted.
	February 28, 2006 - Workplan submitted
	October 2, 2006 – Revised Workplan Submitted
* Phase A - Source Area Investigation	November 1 to December 8, 2006 – Conducted field work. May – Resampled 21 Phase A monitoring wells.
* Phase A - Source Area Investigation Report	August-September 2007
* Phase B – Work Plan	August-September 2007 (to be incorporated with Phase A Report)
* Phase B – Field Work	Late 2007
* Phase B - Risk Assessment	Mid-year 2008
Upgradient Investigation (formerly termed the Background Study)	
* Background Study Workplan	March 30, 2005 – Submitted
* Tronox Response to NDEP May 6, 2005 Comments	July 22, 2005 – Submitted
* Tronox Response to NDEP July 28, 2005 Comments and Submits Upgradient Investigation Workplan (revised Background Study Workplan)	September 30, 2005 – Submitted October 4, 2005 errata sheets submitted
* Upgradient Investigation Workplan Addendum	February 28, 2006 – Submitted.
* Upgradient Investigation Field Work	March 13 – 24, 2006 – Conducted Field Work
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* Tronox Response to NDEP March 23, 2007 Comments	TBD (2007)
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PERIODIC MONITORING AND REPORTING	
ECA Phase II Status Report (Quarterly)	July 15; October 15, 2007
Annual Combined Perchlorate and Chromium Remediation Performance Report	August 29, 2007
Quarterly Perchlorate Remediation Performance Data Submittal	March 1, May 30, and November 30, 2007

TRONOX

Susan Crowley
Staff Environmental Specialist

(702) 651-2234
fax (405) 302-4607
susan.crowley@tronox.com

July 17, 2007

Mr. Brian Rakvica, P.E.
Nevada Division of Environmental Protection
1771 East Flamingo Road, Suite 121-A
Las Vegas, Nevada 89119

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- April 15 – Tronox issued 1st Quarter - 2007 ECA Status Report to NDEP.
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Please note that the Tronox ECA *"Deliverable Schedule"* is attached. Feel free to call me at (702) 651-2234, if you have any questions. Thank you.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

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Attachment: ECA Deliverable Schedule

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Deliverable Schedule

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Palm	Jon	NDEP	X		
Rakvica	Brian	NDEP	X		
Pohlmann	Brenda	COH	X		
Conaty	Barry	COH Counsel	X		
Durr	Paul	DAQEM			
Hunsaker	Ross	DAQEM			
Beckstead	Richard	DAQEM			
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Reed	Tom	Tronox	X		
Hurst	Elizabeth	Tronox Counsel	X		
Stater	Rick	Tronox	X		
Crowley	Susan	Tronox	X		
Krish	Ed	ENSR	X		
Bilodeau	Sally	ENSR	X		
Gerry	Dave	ENSR	X		
Lambeth	Jeff	Veolia			
McDaniel	Tom	Veolia			
Cheung	Mary	Veolia			
Guerriero	Joe	AIG	X		
Giroux	Barry	GEI	X		
Stowers	Kirk	Broadbent ERM			
Sahu	Rahnijit	BMI	X		
Crouse	George	Syngenta	X		
Erickson	Lee	Stauffer	X		
Kelly	Joe	Montrose			
Sundberg	Paul	Montrose	X		
Gibson	Jeff	AmPac			
Sylvia	Chris	Pioneer	X		
Wilkinson	Craig	Timet	X		
Mack	Joel	Montrose Counsel			

ENVIRONMENTAL CONDITIONS ASSESSMENT - DELIVERABLE SCHEDULE
Tronox LLC - Henderson, Nevada
Revised: July 13, 2007

Deliverable	Date
Conceptual Site Model * KM Response to NDEP May 6, 2005 Comments * KM Response to NDEP September 6, 2005 comments	February 28, 2005 – Submitted August 31, 2005 – Submitted October 14, 2005 – Submitted Further revisions will be completed as needed following additional data collection activities
Source Area Evaluation (SAE) * Phase A Work Plan * Phase A - Source Area Investigation * Phase A - Source Area Investigation Report * Phase B – Work Plan * Phase B – Field Work * Phase B - Risk Assessment	September 30, 2005 – Conceptual approach submitted. October 3, 2005 – NDEP approved conceptual approach October 21, 2005 – Workplan schedule submitted. February 28, 2006 - Workplan submitted October 2, 2006 – Revised Workplan Submitted November 1 to December 8, 2006 – Conducted field work. May – Resampled 21 Phase A monitoring wells. August-September 2007 August-September 2007 (to be incorporated with Phase A Report) Late 2007 Mid-year 2008
Upgradient Investigation (formerly termed the Background Study) * Background Study Workplan * Tronox Response to NDEP May 6, 2005 Comments * Tronox Response to NDEP July 28, 2005 Comments and Submits Upgradient Investigation Workplan (revised Background Study Workplan) * Upgradient Investigation Workplan Addendum * Upgradient Investigation Field Work * Upgradient Investigation Report * Tronox Response to NDEP March 23, 2007 Comments	 March 30, 2005 – Submitted July 22, 2005 – Submitted September 30, 2005 – Submitted October 4, 2005 errata sheets submitted February 28, 2006 – Submitted. March 13 – 24, 2006 – Conducted Field Work October 30, 2006 – Submitted to NDEP. TBD (2007)
Quality Assurance Project Plan and Standard Operating Procedures	September 30, 2006 – Submitted September 30, 2006 - Submitted
PERIODIC MONITORING AND REPORTING	
ECA Phase II Status Report (Quarterly)	July 15; October 15, 2007
Annual Combined Perchlorate and Chromium Remediation Performance Report	August 29, 2007
Quarterly Perchlorate Remediation Performance Data Submittal	March 1, May 30, and November 30, 2007

FINAL

Meeting Minutes

Project:	Tronox (TRX)
Location:	Conference Call
Time and Date:	9:30 AM, Friday, July 6, 2007
In Attendance:	NDEP-BCA – Brian Rakvica, Shannon Harbour Teri Copeland (for NDEP) Neptune (for NDEP) – Paul Black Tronox – Keith Bailey ENSR (for TRX) – Dave Gerry, Elizabeth Perry, Lisa Bradley, Robert Kennedy

CC: Jim Najima, Susan Crowley, Paul Hackenberry, Todd Croft

1. The meeting was held to discuss a variety of topics including the Phase A Report and Phase B Work Plan.
2. TRX provided a number of draft tables and figures for discussion purposes via e-mail.
3. Vapor Intrusion, TRX supplied Tables 5.16 and Soil Gas for discussion purposes.
    a. Table 5.16
        i. Groundwater comparison levels for vapor intrusion pathway only.
        ii. NDEP stated that footnotes (c) and (d) seem identical references. TRX to revise these footnotes to state that Beta-BHC is listed in the EPA, 2002 reference as being not sufficiently volatile and that Delta-BHC was not listed but determined not to be volatile by comparison of the definition in EPA, 2002.
        iii. Groundwater to Indoor Air Comparison Level column contains levels from the USEPA 2002 Vapor Intrusion (VI) Guidance for selected chemicals. If a chemical has an MCL, then the MCL is listed instead (which is consistent with the USEPA guidance document for VI).
        iv. TRX submitted a map illustrating the chemicals greater than their respective screening levels at each sampling point and proposed Phase B soil gas borings.
        v. TRX noted that BRC will be responsible for characterizing the top 10 feet of the subsurface during their Phase II characterization work. TRX will be responsible for characterizing the subsurface greater than 10 feet below ground surface (bgs). TRX noted that several of the soil gas sampling locations are near select buildings.
        vi. TRX stated that they have changed the depth of sample collection for soil gas from 5 ft bgs to 10 ft bgs per NDEP's comment during the June 28, 2007 conference call. **ACTION ITEM: NDEP to discuss depth of sampling internally and advise TRX.**
        vii. **ACTION ITEM:** TRX to find out whether duplicate samples were handled by selecting the maximum concentration or the average concentration of the duplicate samples.
    b. Table – Soil Gas
        i. TRX proposed to use method TO 10 for pesticides to achieve lower detection limits for the soil gas samples. TRX stated that the volumes

required to achieve a detection limit of the Ambient Air PRG are very large for alpha-BHC and Heptachlor. These large volumes will be problematic because of the low flow rates that will need to be used. Teri suggested that TRX make an argument based on the CSM and simple partitioning to document that vapor intrusion is an insignificant pathway for these pesticides.

ii. The NDEP stated that they would not object to this argument. Teri noted that the PRG ambient air PRGs consider residential exposure so are therefore very conservative for the industrial scenario.

iii. All arguments and rationale would need to be formalized in the final Risk Assessment for the site.

4. TRX noted that a separate table will be prepared for direct contact pathway.
5. Soil – Groundwater Pathway (Leaching), TRX supplied Tables 5-14 and Table EA-9 Soil Sample Results Greater Than Comparison Levels for Soil to Groundwater Pathway for discussion purposes.
    a. Table 5-14
        i. PRGs (SSLs) used as screening levels if available. If no PRG was available then used site specific calculations (ssSSLs).
        ii. TRX submitted a list of references used in the development of this table. NDEP requested copies of the references not authored by the EPA. TRX will supply at a minimum, the referenced pages of these sources. **ACTION ITEM.**
        iii. TRX used a DAF = 20 in the calculations for the site specific screening levels. TRX believes that a DAF of 20 is appropriate due to the lack of precipitation, the thickness of the vadose zone, and high groundwater flow. The NDEP pointed out that there have been many pipeline failures releasing large volumes of water into the subsurface. TRX noted that these pipelines cross many portions of the facility especially in the vicinity of the unit buildings.
        iv. The NDEP suggested that a DAF = 1 be used in the screening calculations for this initial work. TRX will use DAF = 1 to calculated new screening levels to determine the impact on the number of required analytes. This item will be discussed at or before the next meeting. **ACTION ITEM.**
        v. The NDEP noted that the soil to groundwater pathway is complete due to the continued presence of perchlorate and chromium in the groundwater. TRX stated that some chemicals have completed soil to groundwater pathways but that it hasn't been shown for all of the chemicals listed on this table.
        vi. The NDEP noted that the state considers groundwater to be a receptor and hence the distance to a receptor is small.
        vii. The NDEP noted that there has to be consistency across the complex and that a DAF of 1 has been used throughout the complex.
        viii. The NDEP noted that whichever DAF value is selected, there should be text or a footnote providing the rational for the selected value.
        ix. The NDEP will not review this table until the DAF issue has been resolved.

b. Table EA-9
    i. Exposure Area (EA)-9 contains unit buildings 1 – 4. Sample collected from the Phase A borings that exceeded the screening levels from Table 5-14 were included on this table.
    ii. TRX believes that Dimethoate and Beta-BHC have been adequately characterized.

6. Direct Contact Pathway, TRX supplied Tables 5-20A and Table EA06 Soil Sample Results Greater Than Comparison Levels for Direct Contact Pathways for discussion purposes.
    a. Table 5-20A (soils)
        i. Max Conc. > SSL column may be revised because of the DAF issue from Table 5-14.
        ii. TRX to revise this table as necessary prior to next meeting. **ACTION ITEM.**
    b. Table EA06
        i. Teri will review this table and discuss hexachlorobenzene and chloroform with ENSR. This may require further explanation by ENSR. **ACTION ITEM.**
7. TRX discussed sampling density for the Phase II characterization.
    a. NDEP stated that the sampling density was dependent on the level of contamination. The TRECO site demonstrated data adequacy statistically. The BMI Borrow Pit had a protocol developed to address data adequacy. The NDEP stated that data adequacy can only be determined after sampling. TRX stated that there are other methods for determining data adequacy. The NDEP will supply a copy of the Borrow Pit protocol to TRX. **ACTION ITEM.**
    b. NDEP noted that sample density can be determined on an ad hoc basis, however, this must consider the data. Denisty should be biased towards areas of higher contamination.
8. NDEP noted that the revised historgrams will need to be provided as part of the Phase A/B report/workplan.
9. Schedule:
    a. ECA Phase A Report / Phase B Work Plan (report will include upgradient data and histograms of Phase A and upgradient data) – **August 27, 2007**
    b. Semi-Annual Performance Report – **August 28, 2007**
    c. Revised Groundwater Capture Work Plan – **August 28, 2007**
    d. Upgradient Report (report will include histograms of upgradient data) – **September 2007**
10. Next Meeting: July 18, 2007, 9:00 AM – 5:00 PM PDT at Southern Nevada Water Authority offices, River Mountain Room, located at 1900 East Flamingo Rd., Las Vegas, NV

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Table 5-16
Comparison Levels for Groundwater to Indoor Air
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte (a)	Groundwater to Indoor Air Comparison Level (b) (ug/L)	Basis
Pesticides		
Alpha-BHC	0.31	c
Beta-BHC	(c)	
Delta-BHC	(d)	
Gamma-BHC (Lindane)	1.1	c
Gamma-Chlordane	1.2	c
Heptachlor	0.4	MCL
Methoxychlor	(e)	
Semivolatile Organic Compounds		
1,4-Dioxane		
bis(2-Ethylhexyl)phthalate	(f)	
Di-N-Butyl phthalate	(f)	
Naphthalene	15	nc
Volaltile Organic Compounds		
1,1,1-Trichloroethane	310	nc
1,1-Dichloroethane	220	nc
1,1-Dichloroethene	19	nc
1,2,3-Trichlorobenzene	340	nc
1,2,4-Trichlorobenzene	340	nc
1,2-Dichlorobenzene	260	nc
1,2-Dichloroethane	5	MCL
1,3-Dichlorobenzene	83	nc
1,4-Dichlorobenzene	820	nc
Benzene	5	MCL
Bromobenzene	39	nc
Bromodichloromethane	0.21	c
Bromoform	0.00083	c
Bromomethane	2	nc
Carbon tetrachloride	5	MCL
Chlorobenzene	39	nc
Chloroform	80	MCL
Chloromethane	0.67	c
Dibromochloromethane	0.32	c
Methyl tert butyl ether	12000	nc
Tetrachloroethene	5	MCL
Toluene	150	nc
Trichloroethene	5	MCL
Trichlorofluoromethane	18	nc

Notes:
c - Comparison Level based on potential cancer risk level of 10-6.
nc - Comparison Level based on noncancer hazard quotient of 0.1.
MCL - USEPA (2002) defaults to the USEPA Maximum Contaminant Level (MCL) for constituents with MCLs. August 2006. USEPA, 2006. 2006 Edition of the Drinking Water Standards and Health Advisories. EPA 822-R-06-013.
(a) - Only analytes detected in groundwater that are potentially volatile are listed.
(b) - USEPA. 2002. Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils. November 29, 2002. Table 2c. Values for potential carcinogens are based on a cancer risk level of 10^{-6}; values for noncarcinogens are based on a hazard quotient of 0.1.
(c) - Not sufficiently volatile, per USEPA, 2002 (b).
(d) - Not volatile per the definition in USEPA, 2002 (b) - Henry's law constant is less than 10^{-5} atm/m^3-mol.
(e) - Per USEPA, 2002 (b) - pathway is incomplete; target soil gas exceeds maximum possible vapor concentration.
(f) - Not sufficiently volatile and not sufficiently toxic, per USEPA, 2002 (b).

J:\TronoxGIS\mxd\402-SourceAreaPhaseA\lbmaps\VI-proposed

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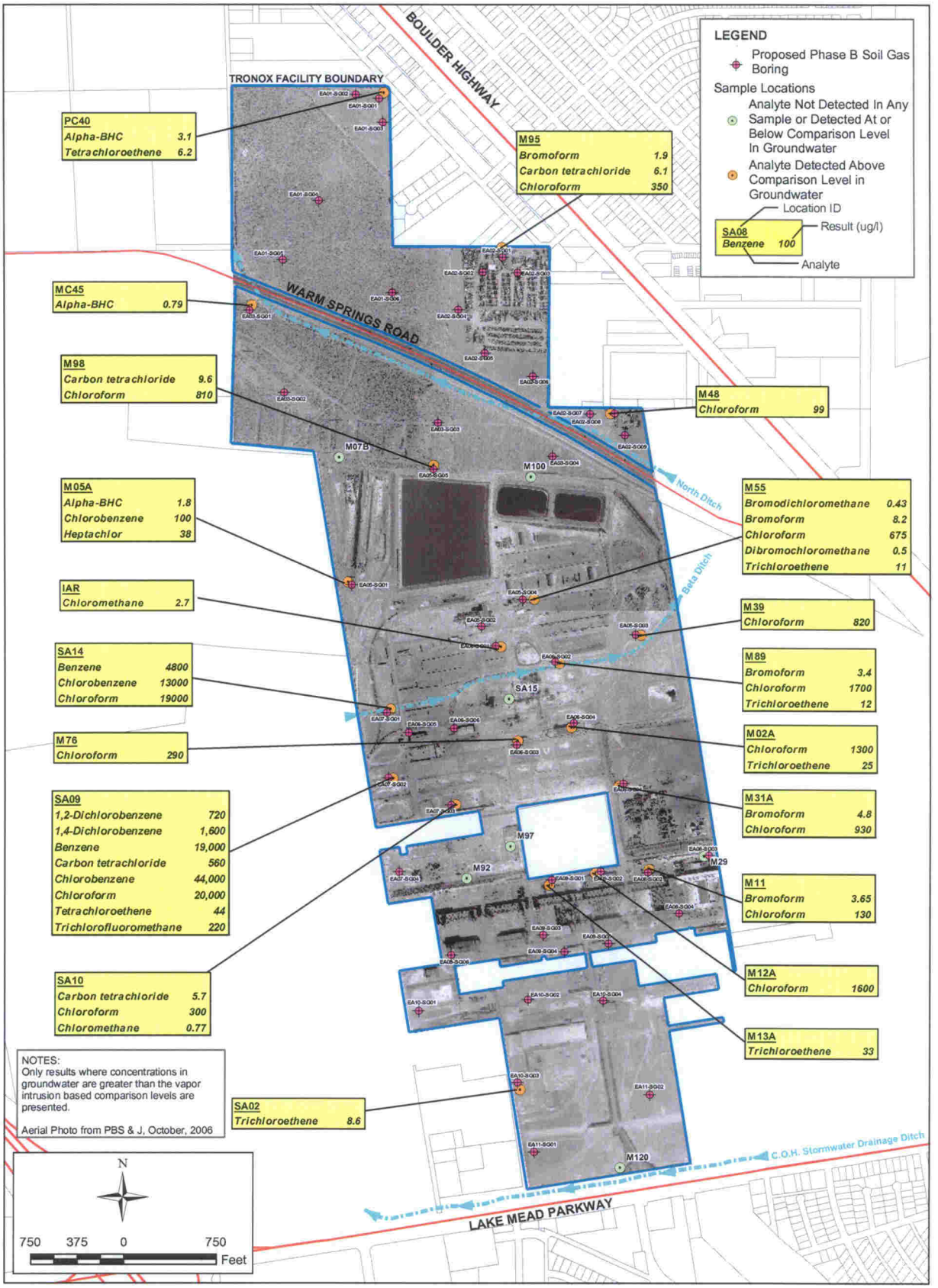

SHEET NUMBER:	FIGURE NUMBER:
X	4-16

PROPOSED SOIL GAS SAMPLING LOCATIONS AND VAPOR INTRUSION EVALUATION
SOURCE AREA INVESTIGATION
PHASE A
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	7/3/2007	04020-023-402

ENSR | AECOM
ENSR CORPORATION
1220 AVENIDA ACASO
CAMARILLO, CALIFORNIA 93012
PHONE: (805) 388-3775
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DESIGNED BY:	REVISIONS:			
B HO	NO:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
T MCADAM				
CHECKED BY:				
B HO				
APPROVED BY:				
D GERRY				

Table - Soil Gas
Proposed SRC List for Phase B Soil Gas Sampling
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analytes	USEPA Region 9 Ambient Air PRG (ug/m3) (a)	EPA Method TO-10A MRL (ug/m3) (b) (c)	Liters Required to Sample to meet PRG (L)
VOCs			
1,2-Dichlorobenzene	2.1E+02	--	--
1,4-Dichlorobenzene	3.1E-01	--	--
Benzene	2.5E-01	--	--
Bromodichloromethane	1.1E-01	--	--
Bromoform	1.7E+00	--	--
Carbon tetrachloride	1.3E-01	--	--
Chlorobenzene	6.2E+01	--	--
Chloroform	8.3E-02	--	--
Chloromethane	9.5E+01	--	--
Dibromochloromethane	8.0E-02	--	--
Tetrachloroethene	3.2E-01	--	--
Trichloroethene	1.7E-02	--	--
Trichlorofluoromethane	7.3E+02	--	--
Pesticides			
Alpha-BHC	1.1E-03	5	4.5E+04
Heptachlor	1.5E-03	5	3.3E+04

MRL - Method Reporting Limit.
PRG - Preliminary Remediation Goal

(a) USEPA, 2004a.
(b) Method TO-10 passes air through a polyurethane foam (PUF) cartridge.
The PUF is extracted and analyzed, the final results are presented as ng/PUF,
standard MRL is 50 ng/PUF, which can be converted to ug/m3 given the air volume sampled.
(c) Assumes a 10 L sample volume.

Table 5-14
Selection of Comparison Levels for Soil for the Soil To Groundwater Migration Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Detected in Soil (h)	USEPA Region 9 PRG-SSL (DAF = 20) (a) (mg/kg)	Selected Groundwater Comparison Level (b) (mg/L)	Soil/Water Partitioning Coefficient (Kd) for Inorganics (c) (L/kg)	Soil/Organic Carbon Partitioning Coefficient (Koc) for Organics (c) (L/kg)	Source of Kd/Koc Data	Henry's Law Constant (K_H) (c) (Unitless)	Source of K_H Data	Site-Specific Soil Screening Level (ssSSL) (DAF = 20) (e) (mg/kg)	Comparison Level (f) (mg/kg)
VOLATILE ORGANIC COMPOUNDS									
1,1,1-Trichloroethane	2.00E+00								2.00E+00
1,1-Dichloroethane	2.30E+01								2.30E+01
1,2,3-Trichlorobenzene		7.00E-02	--	2.27E+03	(5, 7)	3.64E-01	(5)	4.68E+00	4.68E+00
1,2,4-Trichlorobenzene	5.00E+00								5.00E+00
1,2-Dichlorobenzene	1.70E+01								1.70E+01
1,2-Dichloroethane	2.00E-02								2.00E-02
1,3,5-Trimethylbenzene		1.23E-03	--	8.19E+02	(1)	3.16E-01	(1)	3.19E-02	3.19E-02
1,3-Dichlorobenzene		1.83E-02	--	6.17E+02	(1)	7.79E-02	(1)	3.60E-01	3.60E-01
1,4-Dichlorobenzene	2.00E+00								2.00E+00
2-Butanone (MEK)		6.90E-01	--	2.30E+00	(2)	2.29E-03	(2)	1.56E+00	1.56E+00
2-Chlorotoluene		1.22E-02	--	1.60E+02	(1)	1.44E-01	(1)	8.59E-02	8.59E-02
2-Hexanone		2.00E-01	--	1.48E+01	(5, 7)	7.16E-02	(5)	5.59E-01	5.59E-01
Acetone	1.60E+01								1.60E+01
Benzene	3.00E-02								3.00E-02
Bromoform	8.00E-01								8.00E-01
Carbon tetrachloride	7.00E-02								7.00E-02
Chlorobenzene	1.00E+00								1.00E+00
Chloroform	6.00E-01								6.00E-01
Hexachlorobutadiene	2.00E+00								2.00E+00
Methylene chloride	2.00E-02								2.00E-02
Tetrachloroethylene (PCE)	6.00E-02								6.00E-02
Toluene	1.20E+01								1.20E+01
Trichloroethylene (TCE)	6.00E-02								6.00E-02
Trichlorofluoromethane		1.29E-01	--	1.60E+02	(1)	3.98E+00	(1)	2.17E+00	2.17E+00
SEMI-VOLATILE ORGANIC COMPOUNDS									
Benzo(a)anthracene	2.00E+00								2.00E+00
Benzo(a)pyrene	8.00E+00								8.00E+00
Benzo(b)fluoranthene	5.00E+00								5.00E+00
Benzo(g,h,i)perylene		1.83E-02	--	2.80E+06	(4)	5.73E-06	(5)	1.43E+03	1.43E+03
Benzo(k)fluoranthene	4.90E+01								4.90E+01
bis(2-Ethylhexyl)phthalate		6.00E-03	--	1.51E+07	(3)	4.18E-06	(3)	2.54E+03	2.54E+03
Chrysene	1.60E+02								1.60E+02
Diethyl phthalate		2.92E+00	--	2.88E+02	(3)	1.85E-05	(3)	3.00E+01	3.00E+01
Di-n-butyl phthalate	2.30E+03								2.30E+03
Fluoranthene	4.30E+03								4.30E+03
Hexachlorobenzene	2.00E+00								2.00E+00
Indeno(1,2,3-cd)pyrene	1.40E+01								1.40E+01
Naphthalene	8.40E+01								8.40E+01
Octachlorostyrene		--	--	9.68E+05	(7, 8)	9.41E-03	(7)		--
Phenanthrene		1.80E-01	--	3.80E+04	(4)	1.61E-03	(5)	1.92E+02	1.92E+02
Pyrene	4.20E+03								4.20E+03

Table 5-14
Selection of Comparison Levels for Soil for the Soil To Groundwater Migration Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Detected in Soil (h)	USEPA Region 9 PRG-SSL (DAF = 20) (a) (mg/kg)	Selected Groundwater Comparison Level (b) (mg/L)	Soil/Water Partitioning Coefficient (Kd) for Inorganics (c) (L/kg)	Soil/Organic Carbon Partitioning Coefficient (Koc) for Organics (c) (L/kg)	Source of Kd/Koc Data	Henry's Law Constant (K_H) (c) (Unitless)	Source of K_H Data	Site-Specific Soil Screening Level (ssSSL) (DAF = 20) (e) (mg/kg)	Comparison Level (f) (mg/kg)
PESTICIDES (OCPs and OPPs) and PCBs									
Beta BHC	3.00E-03								3.00E-03
4,4'-DDD	1.60E+01								1.60E+01
4,4'-DDE	5.40E+01								5.40E+01
4,4'-DDT	3.20E+01								3.20E+01
Demeton-O		1.46E-04	--	6.31E-02	(7, 8, 9)	1.39E-04	(7, 9)	3.21E-04	3.21E-04
Dimethoate		7.30E-04	--	1.68E+02	(5, 7)	4.30E-09	(7)	5.03E-03	5.03E-03
Endrin Aldehyde		1.09E-03	--	3.26E+04	(5, 7)	1.58E-05	(5)	9.97E-01	9.97E-01
Aroclor-1260		5.00E-04	--	2.91E+05	(7, 8)	1.38E-03	(7)	4.07E+00	4.07E+00
Methoxychlor	1.60E+02								1.60E+02
METALS									
Aluminum		5.00E-02	1.50E+03	--	(6)	--		1.50E+03	1.50E+03
Antimony	5.00E+00								5.00E+00
Arsenic	2.90E+01								2.90E+01
Barium	1.60E+03								1.60E+03
Beryllium	6.30E+01								6.30E+01
Boron		7.30E-01	3.00E+00	--	(6)	--		4.54E+01	4.54E+01
Cadmium	8.00E+00								8.00E+00
Chromium	(g)	1.00E-01	1.80E+06	--	(4)	--		3.60E+06	3.60E+06
Hexavalent, Chromium	3.80E+01								3.80E+01
Cobalt		7.30E-02	4.50E+01	--	(6)	--		6.59E+01	6.59E+01
Copper		1.30E+00	3.60E+02	--	(4)	--		9.36E+03	9.36E+03
Iron		3.00E-01	2.50E+01	--	(6)	--		1.51E+02	1.51E+02
Lead		1.50E-02	8.90E+02	--	(4)	--		2.67E+02	2.67E+02
Manganese		5.00E-02	6.50E+01	--	(6)	--		6.51E+01	6.51E+01
Molybdenum		1.82E-02	2.00E+01	--	(6)	--		7.32E+00	7.32E+00
Mercury		2.00E-03	8.20E+01	--	(3)	--		3.28E+00	3.28E+00
Nickel	1.30E+02								1.30E+02
Platinum		--	9.00E+01	--	(6)	--		--	--
Silver	3.40E+01								3.40E+01
Strontium		2.19E+00	3.50E+01	--	(6)	--		1.54E+03	1.54E+03
Thallium		2.00E-03	7.10E+01	--	(4)	--		2.84E+00	2.84E+00
Tin		2.19E+00	2.50E+02	--	(6)	--		1.10E+04	1.10E+04
Titanium		1.46E+01	1.00E+03	--	(6)	--		2.92E+05	2.92E+05
Tungsten		--	1.50E+02	--	(6)	--		--	--
Uranium		3.00E-02	4.50E+02	--	(6)	--		2.70E+02	2.70E+02
Vanadium	6.00E+03								6.00E+03
Zinc	1.20E+04								1.20E+04

Table 5-14
Selection of Comparison Levels for Soil for the Soil To Groundwater Migration Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Detected in Soil (h)	USEPA Region 9 PRG-SSL (DAF = 20) (a) (mg/kg)	Selected Groundwater Comparison Level (b) (mg/L)	Soil/Water Partitioning Coefficient (Kd) for Inorganics (c) (L/kg)	Soil/Organic Carbon Partitioning Coefficient (Koc) for Organics (c) (L/kg)	Source of Kd/Koc Data	Henry's Law Constant (K_H) (c) (Unitless)	Source of K_H Data	Site-Specific Soil Screening Level (ssSSL) (DAF = 20) (e) (mg/kg)	Comparison Level (f) (mg/kg)

DEFINITIONS
PRG-SSL: Preliminary Remediation Goal (USEPA, 2004a) Soil Screening Level for the migration to groundwater pathway
Kd: Soil-water Partitioning Coefficient
Koc: Soil-organic carbon Partitioning Coefficient
DAF: Dilution Attenuation Factor
ssSSL: Calculated site-specific soil screening level
-- Value not available/not applicable.

NOTES
Calculations were not performed for radionuclides, because results are activities that do not have fate and transport properties.
Due to their low solubility, dioxins and furans are not expected to migrate to groundwater.
The soil to groundwater pathway is assumed to be complete for infinitely soluble constituents (e.g., perchlorate, chloride, sodium, nitrate, sulfate, calcium).

FOOTNOTES
(a) Preliminary Remediation Goals are those provided by USEPA (2004a) for migration to groundwater with a DAF of 20.
(b) Comparison Levels are presented in Table 5-1.
(c) Chemical properties were selected from the following sources, in order of priority:
(1) USEPA (2004a).
(2) USEPA (2004c).
(3) USEPA (1996).
(4) PADEP (2007).
(5) USEPA (1992).
(6) ORNL (1985).
(7) Howard & Meylan (1997).
(8) Estimated from referenced Kow, per USEPA (1996). Appendix K.
(9) Demeton used as surrogate. Kow estimated from Koc, based on LFER for misc. pesticides in Table 7.2 of Schwarzenbach et al. (1993).
(e) Values calculated per text. See Section 5.5.2.
(f) Comparison level is the PRG-SSL; where a PRG-SSL is unavailable, the ssSSL was used
(g) Site-specific SSL calculated for total chromium assuming trivalent chromium (PRG-SSL used for hexavalent chromium).
(h) Calculations were not performed for petroleum hydrocarbons and other constituents for which there is no comparison value for groundwater.

References for Table 5014 – SSL CLs

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Schwarzenbach, R.P., P.M. Gschwend & D.M. Imboden, 1993. Environmental Organic Chemistry. John Wiley & Sons, Inc.: New York.

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USEPA, 2004c. User's Guide Evaluating Subsurface Vapor Intrusion into Buildings. Office of Emergency and Remedial Response, Toxics Integration Branch, U.S. Environmental Protection Agency: Washington, D.C.. March 14, 2003.

5.5.2.1 SSL Equation

Both the published PRG-SSLs and the ssSSLs use the following equation (USEPA 1996a) to estimate the potential for leaching and migration to the groundwater.

$$\textbf{Soil Screening Level (mg/kg)} = (C_w * DAF)[K_d + (O_w + O_a * H)/p_b)]$$

Where:

C_w = target groundwater concentration (mg/L) (typically MCL)
DAF = dilution attenuation factor (dimensionless)
K_d = soil-water partitioning coefficient (L/kg)
O_w = water filled porosity (dimensionless)
O_a = air-filled porosity (dimensionless)
H = Henry's constant (dimensionless)
p_b = dry bulk density (kg/L)
And where (employed for some organic SRCs):
$K_d = K_{oc} \times f_{oc}$
K_{oc} = soil-organic carbon partitioning coefficient (L/kg)
f_{oc} = Fraction organic carbon (g/g)

5.5.2.2 Site-Specific SSL Calculation

USEPA Region 9 provides PRG-SSLs for the migration to groundwater pathway (USEPA 2004a). In the development of these values, the default values provided in the 1996 guidance were used. In the calculation of the ssSSLs, some of the default variables, such as water- and air-filled porosity and dry bulk density were replaced with Site-specific data. The input variables for each screening level are provided below.

Variable	USEPA (2004a)	Site-Specific Values
C_w (mg/L)	Chemical-specific comparison level	Chemical-specific comparison level (see Tables 5-1 and 5-14)
DAF (unitless)	20	20 (default)
K_d (L/kg)	Chemical-specific soil-water partitioning coefficient	Chemical-specific soil-water partitioning coefficient (see Table 5-14)
K_{oc} (L/kg)	Chemical-specific soil-organic carbon-water partitioning coefficient	Chemical-specific soil-organic carbon partitioning coefficient (see Table 5-14)
f_{oc} (g/g)	0.002	0.0014
O_w (unitless)	0.3	0.178
O_a (unitless)	1.2	0.21
H (unitless)	Chemical-specific (see Table 5-14)	Chemical–specific (see Table 5-14)
p_b (kg/L)	1.5	1.64

Table ___

EA-9 Soil Sample Results Greater Than Comparison Levels for Soil to Groundwater Pathway

Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	SRC	Analyte Type	Concentration	Comparison Level (a)	Units	Is Concentration> Comparison Level?	Is Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Soil to Groundwater Pathways? (b)	SRCs to Evaluate in Phase B	Note
SA3-0.5	Aluminum	Metals	6.91E+03	1.50E+03	mg/kg	YES	YES			
SA3-10	Aluminum	Metals	6.13E+03	1.50E+03	mg/kg	YES	YES			
SA3-20	Aluminum	Metals	6.96E+03	1.50E+03	mg/kg	YES	YES			
SA3-30	Aluminum	Metals	7.76E+03	1.50E+03	mg/kg	YES	YES			
SA3-40	Aluminum	Metals	1.35E+04	1.50E+03	mg/kg	YES	YES			
SA4-0.5	Aluminum	Metals	7.49E+03	1.50E+03	mg/kg	YES	YES			
SA4-10	Aluminum	Metals	6.04E+03	1.50E+03	mg/kg	YES	YES			
SA4-20	Aluminum	Metals	6.64E+03	1.50E+03	mg/kg	YES	YES			
SA4-30	Aluminum	Metals	4.26E+03	1.50E+03	mg/kg	YES	YES			
SA4-40	Aluminum	Metals	5.63E+03	1.50E+03	mg/kg	YES	YES			
SA5-0.5	Aluminum	Metals	6.44E+03	1.50E+03	mg/kg	YES	YES			
SA5-10	Aluminum	Metals	5.44E+03	1.50E+03	mg/kg	YES	YES			
SA5-20	Aluminum	Metals	5.45E+03	1.50E+03	mg/kg	YES	YES			
SA5-30	Aluminum	Metals	4.13E+03	1.50E+03	mg/kg	YES	YES			
SA5-37	Aluminum	Metals	1.25E+04	1.50E+03	mg/kg	YES	YES			
SA6-0.5	Aluminum	Metals	6.44E+03	1.50E+03	mg/kg	YES	YES			
SA6-10	Aluminum	Metals	6.44E+03	1.50E+03	mg/kg	YES	YES			
SA6-20	Aluminum	Metals	6.22E+03	1.50E+03	mg/kg	YES	YES			
SA6-30	Aluminum	Metals	5.80E+03	1.50E+03	mg/kg	YES	YES			
SA6-35	Aluminum	Metals	1.25E+04	1.50E+03	mg/kg	YES	YES			
SA3-30	Arsenic	Metals	6.16E+01	2.90E+01	mg/kg	YES	NO	NO	Arsenic	h
SA3-0.5	Calcium	Metals	3.04E+04	none	mg/kg	YES	YES			
SA3-10	Calcium	Metals	1.93E+04	none	mg/kg	YES	YES			
SA3-20	Calcium	Metals	3.02E+04	none	mg/kg	YES	YES			
SA3-30	Calcium	Metals	1.20E+05	none	mg/kg	YES	YES			
SA3-40	Calcium	Metals	3.00E+04	none	mg/kg	YES	YES			
SA4-0.5	Calcium	Metals	2.11E+04	none	mg/kg	YES	YES			
SA4-10	Calcium	Metals	2.53E+04	none	mg/kg	YES	YES			
SA4-20	Calcium	Metals	3.88E+04	none	mg/kg	YES	YES			
SA4-30	Calcium	Metals	9.48E+03	none	mg/kg	YES	YES			
SA4-40	Calcium	Metals	2.66E+04	none	mg/kg	YES	YES			
SA5-0.5	Calcium	Metals	2.24E+04	none	mg/kg	YES	YES			
SA5-10	Calcium	Metals	2.07E+04	none	mg/kg	YES	YES			
SA5-20	Calcium	Metals	2.40E+04	none	mg/kg	YES	YES			
SA5-30	Calcium	Metals	4.71E+04	none	mg/kg	YES	YES			
SA5-37	Calcium	Metals	3.16E+04	none	mg/kg	YES	YES			
SA6-0.5	Calcium	Metals	2.20E+04	none	mg/kg	YES	YES			
SA6-10	Calcium	Metals	2.93E+04	none	mg/kg	YES	YES			
SA6-20	Calcium	Metals	3.36E+04	none	mg/kg	YES	YES			
SA6-30	Calcium	Metals	2.55E+04	none	mg/kg	YES	YES			
SA6-35	Calcium	Metals	3.25E+04	none	mg/kg	YES	YES			
SA3-0.5	Iron	Metals	1.17E+04	1.51E+02	mg/kg	YES	YES			
SA3-10	Iron	Metals	1.20E+04	1.51E+02	mg/kg	YES	YES			

Table ___
EA-9 Soil Sample Results Greater Than Comparison Levels for Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	SRC	Analyte Type	Concentration	Comparison Level (a)	Units	Is Concentration> Comparison Level?	Is Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Soil to Groundwater Pathways? (b)	SRCs to Evaluate in Phase B	Note
SA3-20	Iron	Metals	8.29E+03	1.51E+02	mg/kg	YES	YES			
SA3-30	Iron	Metals	6.88E+03	1.51E+02	mg/kg	YES	YES			
SA3-40	Iron	Metals	1.19E+04	1.51E+02	mg/kg	YES	YES			
SA4-0.5	Iron	Metals	1.33E+04	1.51E+02	mg/kg	YES	YES			
SA4-10	Iron	Metals	8.35E+03	1.51E+02	mg/kg	YES	YES			
SA4-20	Iron	Metals	1.15E+04	1.51E+02	mg/kg	YES	YES			
SA4-30	Iron	Metals	6.47E+03	1.51E+02	mg/kg	YES	YES			
SA4-40	Iron	Metals	1.12E+04	1.51E+02	mg/kg	YES	YES			
SA5-0.5	Iron	Metals	1.18E+04	1.51E+02	mg/kg	YES	YES			
SA5-10	Iron	Metals	1.04E+04	1.51E+02	mg/kg	YES	YES			
SA5-20	Iron	Metals	9.68E+03	1.51E+02	mg/kg	YES	YES			
SA5-30	Iron	Metals	6.50E+03	1.51E+02	mg/kg	YES	YES			
SA5-37	Iron	Metals	1.13E+04	1.51E+02	mg/kg	YES	YES			
SA6-0.5	Iron	Metals	1.06E+04	1.51E+02	mg/kg	YES	YES			
SA6-10	Iron	Metals	1.17E+04	1.51E+02	mg/kg	YES	YES			
SA6-20	Iron	Metals	1.20E+04	1.51E+02	mg/kg	YES	YES			
SA6-30	Iron	Metals	1.12E+04	1.51E+02	mg/kg	YES	YES			
SA6-35	Iron	Metals	1.26E+04	1.51E+02	mg/kg	YES	YES			
SA3-0.5	Magnesium	Metals	6.95E+03	none	mg/kg	YES	YES			
SA3-10	Magnesium	Metals	5.89E+03	none	mg/kg	YES	YES			
SA3-20	Magnesium	Metals	1.01E+04	none	mg/kg	YES	YES			
SA3-30	Magnesium	Metals	4.59E+04	none	mg/kg	YES	NO	NO	Magnesium	h
SA3-40	Magnesium	Metals	4.08E+04	none	mg/kg	YES	NO	NO	Magnesium	g,h
SA4-0.5	Magnesium	Metals	7.57E+03	none	mg/kg	YES	YES			
SA4-10	Magnesium	Metals	5.53E+03	none	mg/kg	YES	YES			
SA4-20	Magnesium	Metals	1.05E+04	none	mg/kg	YES	YES			
SA4-30	Magnesium	Metals	5.11E+03	none	mg/kg	YES	YES			
SA4-40	Magnesium	Metals	6.05E+03	none	mg/kg	YES	YES			
SA5-0.5	Magnesium	Metals	7.04E+03	none	mg/kg	YES	YES			
SA5-10	Magnesium	Metals	6.85E+03	none	mg/kg	YES	YES			
SA5-20	Magnesium	Metals	7.48E+03	none	mg/kg	YES	YES			
SA5-30	Magnesium	Metals	7.81E+03	none	mg/kg	YES	YES			
SA5-37	Magnesium	Metals	4.61E+04	none	mg/kg	YES	NO	NO	Magnesium	g,h
SA6-0.5	Magnesium	Metals	6.91E+03	none	mg/kg	YES	YES			
SA6-10	Magnesium	Metals	6.73E+03	none	mg/kg	YES	YES			
SA6-20	Magnesium	Metals	8.85E+03	none	mg/kg	YES	YES			
SA6-30	Magnesium	Metals	6.88E+03	none	mg/kg	YES	YES			
SA6-35	Magnesium	Metals	2.83E+04	none	mg/kg	YES	YES			
SA3-0.5	Manganese	Metals	3.49E+02	6.51E+01	mg/kg	YES	YES			
SA3-10	Manganese	Metals	2.64E+02	6.51E+01	mg/kg	YES	YES			
SA3-20	Manganese	Metals	2.89E+02	6.51E+01	mg/kg	YES	YES			
SA3-30	Manganese	Metals	1.19E+02	6.51E+01	mg/kg	YES	YES			
SA3-40	Manganese	Metals	1.60E+02	6.51E+01	mg/kg	YES	YES			

Table ___
EA-9 Soil Sample Results Greater Than Comparison Levels for Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	SRC	Analyte Type	Concentration	Comparison Level (a)	Units	Is Concentration> Comparison Level?	Is Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Soil to Groundwater Pathways? (b)	SRCs to Evaluate in Phase B	Note
SA4-0.5	Manganese	Metals	2.54E+02	6.51E+01	mg/kg	YES	YES			
SA4-10	Manganese	Metals	1.76E+02	6.51E+01	mg/kg	YES	YES			
SA4-20	Manganese	Metals	2.95E+02	6.51E+01	mg/kg	YES	YES			
SA4-30	Manganese	Metals	1.57E+02	6.51E+01	mg/kg	YES	YES			
SA4-40	Manganese	Metals	1.86E+02	6.51E+01	mg/kg	YES	YES			
SA5-0.5	Manganese	Metals	4.83E+02	6.51E+01	mg/kg	YES	YES			
SA5-10	Manganese	Metals	2.54E+02	6.51E+01	mg/kg	YES	YES			
SA5-20	Manganese	Metals	2.34E+02	6.51E+01	mg/kg	YES	YES			
SA5-30	Manganese	Metals	1.31E+02	6.51E+01	mg/kg	YES	YES			
SA5-37	Manganese	Metals	1.67E+02	6.51E+01	mg/kg	YES	YES			
SA6-0.5	Manganese	Metals	2.60E+02	6.51E+01	mg/kg	YES	YES			
SA6-10	Manganese	Metals	2.27E+02	6.51E+01	mg/kg	YES	YES			
SA6-20	Manganese	Metals	3.01E+02	6.51E+01	mg/kg	YES	YES			
SA6-30	Manganese	Metals	3.23E+02	6.51E+01	mg/kg	YES	YES			
SA6-35	Manganese	Metals	1.95E+02	6.51E+01	mg/kg	YES	YES			
SA3-0.5	Potassium	Metals	1.86E+03	none	mg/kg	YES	YES			
SA3-10	Potassium	Metals	1.60E+03	none	mg/kg	YES	YES			
SA3-20	Potassium	Metals	1.48E+03	none	mg/kg	YES	YES			
SA3-30	Potassium	Metals	1.57E+03	none	mg/kg	YES	YES			
SA3-40	Potassium	Metals	3.26E+03	none	mg/kg	YES	YES			
SA4-0.5	Potassium	Metals	2.08E+03	none	mg/kg	YES	YES			
SA4-10	Potassium	Metals	2.48E+03	none	mg/kg	YES	YES			
SA4-20	Potassium	Metals	1.30E+03	none	mg/kg	YES	YES			
SA4-30	Potassium	Metals	1.10E+03	none	mg/kg	YES	YES			
SA4-40	Potassium	Metals	1.59E+03	none	mg/kg	YES	YES			
SA5-0.5	Potassium	Metals	2.00E+03	none	mg/kg	YES	YES			
SA5-10	Potassium	Metals	1.29E+03	none	mg/kg	YES	YES			
SA5-20	Potassium	Metals	9.80E+02	none	mg/kg	YES	YES			
SA5-30	Potassium	Metals	1.11E+03	none	mg/kg	YES	YES			
SA5-37	Potassium	Metals	3.11E+03	none	mg/kg	YES	YES			
SA6-0.5	Potassium	Metals	2.15E+03	none	mg/kg	YES	YES			
SA6-10	Potassium	Metals	2.03E+03	none	mg/kg	YES	YES			
SA6-20	Potassium	Metals	1.22E+03	none	mg/kg	YES	YES			
SA6-30	Potassium	Metals	1.05E+03	none	mg/kg	YES	YES			
SA6-35	Potassium	Metals	3.18E+03	none	mg/kg	YES	YES			
SA3-0.5	Sodium	Metals	3.64E+02	none	mg/kg	YES	YES			
SA3-10	Sodium	Metals	3.17E+02	none	mg/kg	YES	YES			
SA3-20	Sodium	Metals	7.56E+02	none	mg/kg	YES	YES			
SA3-30	Sodium	Metals	1.62E+03	none	mg/kg	YES	NO	NO	Sodium	h
SA3-40	Sodium	Metals	6.69E+02	none	mg/kg	YES	YES			
SA4-0.5	Sodium	Metals	1.52E+03	none	mg/kg	YES	NO	NO	Sodium	
SA4-10	Sodium	Metals	8.23E+02	none	mg/kg	YES	YES			
SA4-20	Sodium	Metals	5.56E+02	none	mg/kg	YES	YES			

Table ___
EA-9 Soil Sample Results Greater Than Comparison Levels for Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	SRC	Analyte Type	Concentration	Comparison Level (a)	Units	Is Concentration> Comparison Level?	Is Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Soil to Groundwater Pathways? (b)	SRCs to Evaluate in Phase B	Note
SA4-30	Sodium	Metals	3.60E+02	none	mg/kg	YES	YES			
SA4-40	Sodium	Metals	6.09E+02	none	mg/kg	YES	YES			
SA5-0.5	Sodium	Metals	1.79E+03	none	mg/kg	YES	NO	NO	Sodium	
SA5-10	Sodium	Metals	5.22E+02	none	mg/kg	YES	YES			
SA5-20	Sodium	Metals	5.32E+02	none	mg/kg	YES	YES			
SA5-30	Sodium	Metals	1.12E+03	none	mg/kg	YES	YES			
SA5-37	Sodium	Metals	4.56E+03	none	mg/kg	YES	NO	NO	Sodium	g,h
SA6-0.5	Sodium	Metals	5.93E+02	none	mg/kg	YES	YES			
SA6-10	Sodium	Metals	5.81E+02	none	mg/kg	YES	YES			
SA6-20	Sodium	Metals	4.43E+02	none	mg/kg	YES	YES			
SA6-30	Sodium	Metals	6.99E+02	none	mg/kg	YES	YES			
SA6-35	Sodium	Metals	5.77E+02	none	mg/kg	YES	YES			
SA5-0.5	Dimethoate	O. Pesticides	1.30E-02	3.21E-04	mg/kg	YES	NO	NO	(e)	
SA6-0.5	Dimethoate	O. Pesticides	1.15E-02	3.21E-04	mg/kg	YES	NO	NO	(e)	
SA3-0.5	Perchlorate	Perchlorate	1.71E+00	none	mg/kg	YES	NO	NO	Perchlorate	
SA3-10	Perchlorate	Perchlorate	1.02E+01	none	mg/kg	YES	NO	NO	Perchlorate	
SA3-20	Perchlorate	Perchlorate	6.10E+00	none	mg/kg	YES	NO	NO	Perchlorate	
SA3-30	Perchlorate	Perchlorate	9.74E-01	none	mg/kg	YES	NO	NO	Perchlorate	h
SA3-40	Perchlorate	Perchlorate	8.67E-02	none	mg/kg	YES	NO	NO	Perchlorate	g,h
SA4-0.5	Perchlorate	Perchlorate	3.14E+00	none	mg/kg	YES	NO	NO	Perchlorate	
SA4-10	Perchlorate	Perchlorate	4.96E-01	none	mg/kg	YES	NO	NO	Perchlorate	
SA4-20	Perchlorate	Perchlorate	3.80E+00	none	mg/kg	YES	NO	NO	Perchlorate	
SA4-30	Perchlorate	Perchlorate	4.28E+01	none	mg/kg	YES	NO	NO	Perchlorate	
SA4-40	Perchlorate	Perchlorate	7.39E+01	none	mg/kg	YES	NO	NO	Perchlorate	h
SA5-0.5	Perchlorate	Perchlorate	1.49E+01	none	mg/kg	YES	NO	NO	Perchlorate	
SA5-10	Perchlorate	Perchlorate	1.12E+02	none	mg/kg	YES	NO	NO	Perchlorate	
SA5-20	Perchlorate	Perchlorate	6.64E+01	none	mg/kg	YES	NO	NO	Perchlorate	
SA5-30	Perchlorate	Perchlorate	1.91E+01	none	mg/kg	YES	NO	NO	Perchlorate	
SA5-37	Perchlorate	Perchlorate	3.75E+02	none	mg/kg	YES	NO	NO	Perchlorate	g,h
SA6-0.5	Perchlorate	Perchlorate	3.33E-01	none	mg/kg	YES	NO	NO	Perchlorate	
SA6-10	Perchlorate	Perchlorate	2.32E+00	none	mg/kg	YES	NO	NO	Perchlorate	
SA6-20	Perchlorate	Perchlorate	3.02E+00	none	mg/kg	YES	NO	NO	Perchlorate	
SA6-30	Perchlorate	Perchlorate	5.34E+00	none	mg/kg	YES	NO	NO	Perchlorate	
SA6-35	Perchlorate	Perchlorate	5.41E+01	none	mg/kg	YES	NO	NO	Perchlorate	h
SA4-0.5	Beta-BHC	Pesticide	3.60E-03	3.00E-03	mg/kg	YES	NO	NO	(f)	
SA5-0.5	Beta-BHC	Pesticide	3.50E-03	3.00E-03	mg/kg	YES	NO	NO	(f)	
SA3-0.5	Ra-226	RAD	1.06E+00	none	pci/g	YES	YES			
SA3-10	Ra-226	RAD	1.01E+00	none	pci/g	YES	YES			
SA3-20	Ra-226	RAD	1.19E+00	none	pci/g	YES	YES			
SA3-30	Ra-226	RAD	1.59E+00	none	pci/g	YES	YES			
SA3-40	Ra-226	RAD	2.34E+00	none	pci/g	YES	YES			
SA4-0.5	Ra-226	RAD	1.10E+00	none	pci/g	YES	YES			
SA4-10	Ra-226	RAD	1.13E+00	none	pci/g	YES	YES			

Table ___
EA-9 Soil Sample Results Greater Than Comparison Levels for Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	SRC	Analyte Type	Concentration	Comparison Level (a)	Units	Is Concentration> Comparison Level?	Is Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Soil to Groundwater Pathways? (b)	SRCs to Evaluate in Phase B	Note
SA4-20	Ra-226	RAD	1.19E+00	none	pci/g	YES	YES			
SA4-30	Ra-226	RAD	1.45E+00	none	pci/g	YES	YES			
SA4-40	Ra-226	RAD	1.60E+00	none	pci/g	YES	YES			
SA5-0.5	Ra-226	RAD	1.12E+00	none	pci/g	YES	YES			
SA5-10	Ra-226	RAD	1.07E+00	none	pci/g	YES	YES			
SA5-20	Ra-226	RAD	1.10E+00	none	pci/g	YES	YES			
SA5-30	Ra-226	RAD	2.29E+00	none	pci/g	YES	YES			
SA5-37	Ra-226	RAD	2.46E+00	none	pci/g	YES	YES			
SA6-0.5	Ra-226	RAD	1.25E+00	none	pci/g	YES	YES			
SA6-10	Ra-226	RAD	1.07E+00	none	pci/g	YES	YES			
SA6-20	Ra-226	RAD	1.21E+00	none	pci/g	YES	YES			
SA6-30	Ra-226	RAD	1.49E+00	none	pci/g	YES	YES			
SA6-35	Ra-226	RAD	2.10E+00	none	pci/g	YES	YES			
SA3-0.5	Ra-228	RAD	1.46E+00	none	pci/g	YES	YES			
SA3-10	Ra-228	RAD	1.65E+00	none	pci/g	YES	YES			
SA3-20	Ra-228	RAD	1.66E+00	none	pci/g	YES	YES			
SA4-0.5	Ra-228	RAD	1.83E+00	none	pci/g	YES	YES			
SA4-10	Ra-228	RAD	1.81E+00	none	pci/g	YES	YES			
SA4-20	Ra-228	RAD	1.53E+00	none	pci/g	YES	YES			
SA4-30	Ra-228	RAD	1.91E+00	none	pci/g	YES	YES			
SA4-40	Ra-228	RAD	1.90E+00	none	pci/g	YES	YES			
SA5-0.5	Ra-228	RAD	1.92E+00	none	pci/g	YES	YES			
SA5-10	Ra-228	RAD	1.66E+00	none	pci/g	YES	YES			
SA5-20	Ra-228	RAD	1.52E+00	none	pci/g	YES	YES			
SA5-30	Ra-228	RAD	1.68E+00	none	pci/g	YES	YES			
SA5-37	Ra-228	RAD	8.06E-01	none	pci/g	YES	YES			
SA6-0.5	Ra-228	RAD	1.88E+00	none	pci/g	YES	YES			
SA6-10	Ra-228	RAD	1.80E+00	none	pci/g	YES	YES			
SA6-20	Ra-228	RAD	1.63E+00	none	pci/g	YES	YES			
SA6-30	Ra-228	RAD	1.94E+00	none	pci/g	YES	YES			
SA3-10	Th-228	RAD	6.91E-01	none	pci/g	YES	YES			
SA4-20	Th-228	RAD	5.11E-01	none	pci/g	YES	YES			
SA5-30	Th-228	RAD	4.81E-01	none	pci/g	YES	YES			
SA6-10	Th-228	RAD	6.01E-01	none	pci/g	YES	YES			
SA3-10	Th-230	RAD	5.54E-01	none	pci/g	YES	YES			
SA4-20	Th-230	RAD	8.75E-01	none	pci/g	YES	YES			
SA5-30	Th-230	RAD	2.23E+00	none	pci/g	YES	YES			
SA6-10	Th-230	RAD	6.19E-01	none	pci/g	YES	YES			
SA3-10	Th-232	RAD	6.01E-01	none	pci/g	YES	YES			
SA4-20	Th-232	RAD	7.06E-01	none	pci/g	YES	YES			
SA5-30	Th-232	RAD	5.90E-01	none	pci/g	YES	YES			
SA6-10	Th-232	RAD	6.68E-01	none	pci/g	YES	YES			
SA3-0.5	Total Alkalinity	Chemistry	7.83E+02	none	mg/kg	YES	NO	NO	Total Alkalinity	

Table ___
EA-9 Soil Sample Results Greater Than Comparison Levels for Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	SRC	Analyte Type	Concentration	Comparison Level (a)	Units	Is Concentration> Comparison Level?	Is Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Soil to Groundwater Pathways? (b)	SRCs to Evaluate in Phase B	Note
SA3-10	Total Alkalinity	Chemistry	1.08E+03	none	mg/kg	YES	NO	NO	Total Alkalinity	
SA3-20	Total Alkalinity	Chemistry	6.11E+02	none	mg/kg	YES	NO	NO	Total Alkalinity	
SA3-30	Total Alkalinity	Chemistry	1.39E+02	none	mg/kg	YES	YES			
SA3-40	Total Alkalinity	Chemistry	2.12E+03	none	mg/kg	YES	NO	NO	Total Alkalinity	g,h
SA4-0.5	Total Alkalinity	Chemistry	1.95E+03	none	mg/kg	YES	NO	NO	Total Alkalinity	
SA4-10	Total Alkalinity	Chemistry	2.07E+03	none	mg/kg	YES	NO	NO	Total Alkalinity	
SA4-20	Total Alkalinity	Chemistry	2.33E+03	none	mg/kg	YES	NO	NO	Total Alkalinity	
SA4-30	Total Alkalinity	Chemistry	1.00E+03	none	mg/kg	YES	NO	NO	Total Alkalinity	
SA4-40	Total Alkalinity	Chemistry	2.27E+02	none	mg/kg	YES	YES			
SA5-0.5	Total Alkalinity	Chemistry	1.96E+03	none	mg/kg	YES	NO	NO	Total Alkalinity	
SA5-10	Total Alkalinity	Chemistry	8.74E+02	none	mg/kg	YES	NO	NO	Total Alkalinity	
SA5-20	Total Alkalinity	Chemistry	4.54E+02	none	mg/kg	YES	YES			
SA5-30	Total Alkalinity	Chemistry	3.14E+02	none	mg/kg	YES	YES			
SA5-37	Total Alkalinity	Chemistry	4.30E+02	none	mg/kg	YES	YES			
SA6-0.5	Total Alkalinity	Chemistry	2.69E+03	none	mg/kg	YES	NO	NO	Total Alkalinity	
SA6-10	Total Alkalinity	Chemistry	6.40E+02	none	mg/kg	YES	NO	NO	Total Alkalinity	
SA6-20	Total Alkalinity	Chemistry	8.21E+02	none	mg/kg	YES	NO	NO	Total Alkalinity	
SA6-30	Total Alkalinity	Chemistry	3.04E+02	none	mg/kg	YES	YES			
SA6-35	Total Alkalinity	Chemistry	5.36E+02	none	mg/kg	YES	NO	NO	Total Alkalinity	h
SA3-20	Chlorate	Chemistry	1.76E+01	none	mg/kg	YES	NO	NO	Chlorate	
SA4-30	Chlorate	Chemistry	9.13E+01	none	mg/kg	YES	NO	NO	Chlorate	
SA4-40	Chlorate	Chemistry	1.19E+02	none	mg/kg	YES	NO	NO	Chlorate	h
SA5-0.5	Chlorate	Chemistry	1.44E+01	none	mg/kg	YES	NO	NO	Chlorate	
SA5-10	Chlorate	Chemistry	6.42E+02	none	mg/kg	YES	NO	NO	Chlorate	
SA5-20	Chlorate	Chemistry	1.31E+03	none	mg/kg	YES	NO	NO	Chlorate	
SA5-30	Chlorate	Chemistry	4.29E+02	none	mg/kg	YES	NO	NO	Chlorate	
SA6-10	Chlorate	Chemistry	2.80E+00	none	mg/kg	YES	NO	NO	Chlorate	
SA6-20	Chlorate	Chemistry	3.00E+00	none	mg/kg	YES	NO	NO	Chlorate	
SA6-30	Chlorate	Chemistry	8.69E+01	none	mg/kg	YES	NO	NO	Chlorate	
SA6-35	Chlorate	Chemistry	2.07E+02	none	mg/kg	YES	NO	NO	Chlorate	h
SA3-0.5	Chloride	Chemistry	9.50E-01	none	mg/kg	YES	YES			
SA3-10	Chloride	Chemistry	1.32E+01	none	mg/kg	YES	YES			
SA3-20	Chloride	Chemistry	1.30E+02	none	mg/kg	YES	YES			
SA3-30	Chloride	Chemistry	1.24E+03	none	mg/kg	YES	NO	NO	Chloride	h
SA3-40	Chloride	Chemistry	1.20E+02	none	mg/kg	YES	YES			
SA4-0.5	Chloride	Chemistry	2.80E+00	none	mg/kg	YES	YES			
SA4-10	Chloride	Chemistry	4.40E+00	none	mg/kg	YES	YES			
SA4-20	Chloride	Chemistry	1.72E+02	none	mg/kg	YES	YES			
SA4-30	Chloride	Chemistry	4.65E+01	none	mg/kg	YES	YES			
SA4-40	Chloride	Chemistry	7.12E+01	none	mg/kg	YES	YES			
SA5-0.5	Chloride	Chemistry	1.30E+01	none	mg/kg	YES	YES			
SA5-10	Chloride	Chemistry	3.77E+02	none	mg/kg	YES	YES			
SA5-20	Chloride	Chemistry	1.56E+03	none	mg/kg	YES	NO	NO	Chloride	

Table ___
EA-9 Soil Sample Results Greater Than Comparison Levels for Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	SRC	Analyte Type	Concentration	Comparison Level (a)	Units	Is Concentration> Comparison Level?	Is Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Soil to Groundwater Pathways? (b)	SRCs to Evaluate in Phase B	Note
SA5-30	Chloride	Chemistry	1.07E+03	none	mg/kg	YES	YES			
SA5-37	Chloride	Chemistry	5.60E+03	none	mg/kg	YES	NO	NO	Chloride	g,h
SA6-0.5	Chloride	Chemistry	6.80E+00	none	mg/kg	YES	YES			
SA6-10	Chloride	Chemistry	9.80E+00	none	mg/kg	YES	YES			
SA6-20	Chloride	Chemistry	1.39E+01	none	mg/kg	YES	YES			
SA6-30	Chloride	Chemistry	7.77E+01	none	mg/kg	YES	YES			
SA6-35	Chloride	Chemistry	4.14E+02	none	mg/kg	YES	YES			
SA3-10	Nitrate	Chemistry	2.60E+00	none	mg/kg	YES	YES			
SA3-20	Nitrate	Chemistry	8.20E+00	none	mg/kg	YES	YES			
SA3-30	Nitrate	Chemistry	1.27E+01	none	mg/kg	YES	YES			
SA3-40	Nitrate	Chemistry	1.60E+00	none	mg/kg	YES	YES			
SA4-0.5	Nitrate	Chemistry	5.30E-01	none	mg/kg	YES	YES			
SA4-10	Nitrate	Chemistry	3.50E-01	none	mg/kg	YES	YES			
SA4-20	Nitrate	Chemistry	1.00E+00	none	mg/kg	YES	YES			
SA4-30	Nitrate	Chemistry	1.40E+00	none	mg/kg	YES	YES			
SA4-40	Nitrate	Chemistry	1.50E+00	none	mg/kg	YES	YES			
SA5-10	Nitrate	Chemistry	4.30E+00	none	mg/kg	YES	YES			
SA5-20	Nitrate	Chemistry	2.02E+01	none	mg/kg	YES	YES			
SA5-30	Nitrate	Chemistry	2.10E+01	none	mg/kg	YES	YES			
SA5-37	Nitrate	Chemistry	6.82E+01	none	mg/kg	YES	NO	NO	Nitrate	g,h
SA6-0.5	Nitrate	Chemistry	3.75E-01	none	mg/kg	YES	YES			
SA6-10	Nitrate	Chemistry	1.60E+00	none	mg/kg	YES	YES			
SA6-20	Nitrate	Chemistry	2.30E+00	none	mg/kg	YES	YES			
SA6-30	Nitrate	Chemistry	1.96E+01	none	mg/kg	YES	YES			
SA6-35	Nitrate	Chemistry	2.65E+01	none	mg/kg	YES	YES			
SA3-20	Nitrite	Chemistry	1.70E+00	none	mg/kg	YES	NO	NO	Nitrite	
SA3-30	Nitrite	Chemistry	1.19E+01	none	mg/kg	YES	NO	NO	Nitrite	h
SA4-0.5	Nitrite	Chemistry	4.70E-02	none	mg/kg	YES	NO	NO	Nitrite	
SA4-10	Nitrite	Chemistry	3.40E-01	none	mg/kg	YES	NO	NO	Nitrite	
SA4-30	Nitrite	Chemistry	5.90E-02	none	mg/kg	YES	NO	NO	Nitrite	
SA4-40	Nitrite	Chemistry	1.40E-01	none	mg/kg	YES	NO	NO	Nitrite	h
SA5-0.5	Nitrite	Chemistry	2.10E-01	none	mg/kg	YES	NO	NO	Nitrite	
SA6-10	Nitrite	Chemistry	3.20E-01	none	mg/kg	YES	NO	NO	Nitrite	
SA6-20	Nitrite	Chemistry	9.30E-01	none	mg/kg	YES	NO	NO	Nitrite	
SA3-10	ortho-Phosphate	Chemistry	1.40E+00	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA3-20	ortho-Phosphate	Chemistry	1.91E+01	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA3-30	ortho-Phosphate	Chemistry	2.80E+00	none	mg/kg	YES	NO	NO	ortho-Phosphate	h
SA4-0.5	ortho-Phosphate	Chemistry	2.50E+00	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA4-10	ortho-Phosphate	Chemistry	2.70E+00	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA4-20	ortho-Phosphate	Chemistry	2.40E+00	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA4-30	ortho-Phosphate	Chemistry	1.12E+02	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA4-40	ortho-Phosphate	Chemistry	1.47E+02	none	mg/kg	YES	NO	NO	ortho-Phosphate	h
SA5-0.5	ortho-Phosphate	Chemistry	1.71E+01	none	mg/kg	YES	NO	NO	ortho-Phosphate	

Table ___
EA-9 Soil Sample Results Greater Than Comparison Levels for Soil to Groundwater Pathway
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	SRC	Analyte Type	Concentration	Comparison Level (a)	Units	Is Concentration> Comparison Level?	Is Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Soil to Groundwater Pathways? (b)	SRCs to Evaluate in Phase B	Note
SA5-10	ortho-Phosphate	Chemistry	6.58E+02	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA5-20	ortho-Phosphate	Chemistry	9.77E+02	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA5-30	ortho-Phosphate	Chemistry	2.45E+02	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA5-37	ortho-Phosphate	Chemistry	8.89E+03	none	mg/kg	YES	NO	NO	ortho-Phosphate	g,h
SA6-10	ortho-Phosphate	Chemistry	4.70E+00	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA6-20	ortho-Phosphate	Chemistry	3.80E+00	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA6-30	ortho-Phosphate	Chemistry	7.96E+01	none	mg/kg	YES	NO	NO	ortho-Phosphate	
SA6-35	ortho-Phosphate	Chemistry	2.20E+02	none	mg/kg	YES	NO	NO	ortho-Phosphate	h
SA3-0.5	Sulfate	Chemistry	7.90E+00	none	mg/kg	YES	YES			
SA3-10	Sulfate	Chemistry	1.56E+02	none	mg/kg	YES	YES			
SA3-20	Sulfate	Chemistry	2.67E+02	none	mg/kg	YES	YES			
SA3-30	Sulfate	Chemistry	5.73E+02	none	mg/kg	YES	YES			
SA3-40	Sulfate	Chemistry	3.25E+02	none	mg/kg	YES	YES			
SA4-0.5	Sulfate	Chemistry	1.95E+01	none	mg/kg	YES	YES			
SA4-10	Sulfate	Chemistry	2.49E+01	none	mg/kg	YES	YES			
SA4-20	Sulfate	Chemistry	8.74E+01	none	mg/kg	YES	YES			
SA4-30	Sulfate	Chemistry	7.33E+02	none	mg/kg	YES	YES			
SA4-40	Sulfate	Chemistry	1.77E+02	none	mg/kg	YES	YES			
SA5-0.5	Sulfate	Chemistry	7.70E+01	none	mg/kg	YES	YES			
SA5-10	Sulfate	Chemistry	4.79E+02	none	mg/kg	YES	YES			
SA5-20	Sulfate	Chemistry	1.68E+02	none	mg/kg	YES	YES			
SA5-30	Sulfate	Chemistry	1.03E+03	none	mg/kg	YES	YES			
SA5-37	Sulfate	Chemistry	8.04E+02	none	mg/kg	YES	YES			
SA6-0.5	Sulfate	Chemistry	1.31E+02	none	mg/kg	YES	YES			
SA6-10	Sulfate	Chemistry	1.75E+02	none	mg/kg	YES	YES			
SA6-20	Sulfate	Chemistry	2.14E+02	none	mg/kg	YES	YES			
SA6-30	Sulfate	Chemistry	7.71E+03	none	mg/kg	YES	NO	NO	Sulfate	
SA6-35	Sulfate	Chemistry	5.99E+02	none	mg/kg	YES	YES			

Notes:
bgs - below ground surface.
ft - feet.
ID - Identification.
SRC - Site-Related Chemical.
(a) See Table 5-1 for comparison levels, as well as references, footnotes and synonyms.
(b) See Section___.
(c) See Section___ and Table ___.
(d) Sample collected either below water table or within capillary fringe.
(e) See text.
(f) BetaBHC concentrations only slightly greater than SGW CL, and present in surface soils. Therefore, little potential for migrating to groundwater.
(g) Soil sample collected below the water table (saturated).
(h) Sample logged as MCfg1 formation with high percentage of fines.

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Table 5-20A (rev 1)
Summary of SRC Results in Soil Above Direct Contact and SSL Comparison Levels
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type / Analytical Method / SRC	Max Conc. > Direct Contact Comparison Level (a)	Max Conc. > SSL Comparison Level (b)	Consistent with Background ?	Proposed Phase B SRC List
Metals				
SW 846 6020				
Aluminum		X	Yes	No
Antimony		X	No	X
Arsenic	X	X	No	X
Boron		X	No	X
Chromium	X		No	X
Iron		X	Yes	No
Lead	X	X	No	X
Magnesium		(c)	No	X
Manganese	X	X	No	X
Potassium		(c)	Yes	No
Strontium		X	No	X
Thallium		X	No	X
SW 846 7199				
CR, Hexavalent	X		No	X
Perchlorate				
EPA 314.0				
Perchlorate	X	X	No	X
O. Pesticides				
SW846 8141A				
Demeton-O		X	No	No (e)
Dimethoate		X	No	No (e)
Pesticide				
SW 846 8081				
Beta-BHC	X	X	No	X
RAD				
HASL-300 gamma				
Ra-226	X	(f)	No	Yes
Ra-228	X	(f)	Yes	No
HASL-300 TH MOD				
Th-228	X	(f)	Yes	No
Th-230	X	(f)	Yes	No
Th-232		(f)	Yes	No
HASL-300 U MOD				
URANIUM-233/234	X	(f)	Yes	No
URANIUM-235/236	X	(f)	Yes	No
URANIUM-238	X	(f)	Yes	No
SVOC				
SW 846 8270				
Benzo(a)pyrene	X		No	No (e)
Hexachlorobenzene	X		No	No (e)
TPH				
SW 846 8015B DRO				
Oil Range Organics	X	--	No	No (e)
Total petroleum hydrocarbon-diesel	X	--	No	No (e)
VOC				
SW 846 8260				
Benzene	X	X	No	X
Chlorobenzene		X	No	X
Chloroform	X	X	No	X
Methylene chloride		X	No	X
Asbestos				
540/R-97/028				
Asbestos	(d)	--	No	X
Chemistry				
SW 846 9056				
Chloride	NA	(c)	No	X
Nitrate	NA	(c)	No	X
Sulfate	NA	(c)	No	X
Sodium	NA	(c)	No	X
Calcium	NA	(c)	No	X
Alkalinity	NA	(c)	TBD	X
Ammonia	NA	(c)	TBD	X
Chlorate	NA	(c)	No	X
Nitrite	NA	(c)	Yes	X
ortho-Phosphate	NA	(c)	TBD	X

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Table 5-20A (rev 1)
Summary of SRC Results in Soil Above Direct Contact and SSL Comparison Levels
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Notes:
NA - Not Applicable.
SRC - Site-Related Chemical.
SSL - Soil Screening Level (soil to groundwater pathway).
TBD - To be determined.
-- - Not evaluated for that pathway.
blank - SRC maximum concentration not above comparison level.
(a) See Table 5-10.
(b) See Table 5-15.
(c) Soil to groundwater pathway assumed to be complete due to high solubility.
(d) See Table 6-5.
(e) See text.
(f) CLs for soil-to-gw pathway not developed for radionuclide activities.

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Table ___

EA06 Soil Sample Results Greater Than Comparison Levels for Direct Contact Pathways

Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	Analyte Type	SRC	Concentration	Comparison Level (a)	Units	Is Concentration >Comparison Level?	Is Sample within 0-10 ft bgs? (b)	Is Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Direct Contact Pathways? (d)	SRCs to Evaluate in Phase B	Note
SA16-0.5	DIOXINS	Total TEQ - ENSR Calculated	1.15E+03	1.00E+03	ng/kg	Yes	Yes	NA	Yes		(f)
SA11-20	Metals	Arsenic	4.60E+00	1.59E-01	mg/kg	Yes	No		Yes		
SA12-10	Metals	Arsenic	2.60E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes		
SA12-20	Metals	Arsenic	7.40E+00	1.59E-01	mg/kg	Yes	No		Yes		
SA16-0.5	Metals	Arsenic	2.50E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes		
SA11-30	Metals	Arsenic	2.03E+01	1.59E-01	mg/kg	Yes	No		Yes		
SA12-0.5	Metals	Arsenic	2.90E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes		
SA12-30	Metals	Arsenic	2.13E+01	1.59E-01	mg/kg	Yes	No		Yes		
SA16-20	Metals	Arsenic	5.60E+00	1.59E-01	mg/kg	Yes	No		Yes		
SA11-10	Metals	Arsenic	3.80E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes		
SA16-30	Metals	Arsenic	2.48E+01	1.59E-01	mg/kg	Yes	No		Yes		
SA16-10	Metals	Arsenic	4.30E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes		
SA15-30	Metals	Arsenic	2.04E+01	1.59E-01	mg/kg	Yes	No		Yes		
SA11-0.5	Metals	Arsenic	2.80E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes		
SA15-20	Metals	Arsenic	1.14E+01	1.59E-01	mg/kg	Yes	No		Yes		
SA15-10	Metals	Arsenic	4.75E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes		
SA15-0.5	Metals	Arsenic	2.50E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes		
SA15-35	Metals	Arsenic	1.62E+01	1.59E-01	mg/kg	Yes	No		Yes		
SA16-30	Metals	CR, Hexavalent	9.30E+00	6.41E+00	mg/kg	Yes	No		Yes		
SA11-10	Metals	CR, Hexavalent	1.18E+01	6.41E+00	mg/kg	Yes	Yes	No	Yes		(g)
SA15-10	Perchlorate	Perchlorate	1.19E+03	1.00E+01	mg/kg	Yes	Yes	No	No	Perchlorate	
SA16-30	Perchlorate	Perchlorate	1.86E+03	1.00E+01	mg/kg	Yes	No		Yes		
SA15-35	Perchlorate	Perchlorate	2.04E+02	1.00E+01	mg/kg	Yes	No		Yes		
SA15-0.5	Perchlorate	Perchlorate	1.13E+02	1.00E+01	mg/kg	Yes	Yes	No	No	Perchlor	
SA15-20	Perchlorate	Perchlorate	9.43E+02	1.00E+01	mg/kg	Yes	No		Yes		
SA11-20	Perchlorate	Perchlorate	2.10E+02	1.00E+01	mg/kg	Yes	No		Yes		
SA12-30	Perchlorate	Perchlorate	1.84E+02	1.00E+01	mg/kg	Yes	No		Yes		
SA11-0.5	Perchlorate	Perchlorate	6.75E+01	1.00E+01	mg/kg	Yes	Yes	No	No	Perchlorate	
SA11-10	Perchlorate	Perchlorate	2.04E+02	1.00E+01	mg/kg	Yes	Yes	No	No	Perchlorate	
SA15-30	Perchlorate	Perchlorate	2.33E+03	1.00E+01	mg/kg	Yes	No		Yes		
SA11-30	Perchlorate	Perchlorate	5.69E+01	1.00E+01	mg/kg	Yes	No		Yes		
SA16-10	RAD	Ra-226	1.07E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes		
SA16-20	RAD	Ra-226	1.85E+00	2.60E-03	pci/g	Yes	No		Yes		
SA11-10	RAD	Ra-226	1.70E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes		
SA11-20	RAD	Ra-226	1.06E+00	2.60E-03	pci/g	Yes	No		Yes		
SA16-0.5	RAD	Ra-226	1.16E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes		
SA11-0.5	RAD	Ra-226	9.26E-01	2.60E-03	pci/g	Yes	Yes	Yes	Yes		
SA11-30	RAD	Ra-226	2.49E+00	2.60E-03	pci/g	Yes	No		Yes		
SA15-30	RAD	Ra-226	1.91E+00	2.60E-03	pci/g	Yes	No		Yes		
SA15-10	RAD	Ra-226	1.21E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes		
SA15-35	RAD	Ra-226	1.54E+00	2.60E-03	pci/g	Yes	No		Yes		
SA12-10	RAD	Ra-226	9.80E-01	2.60E-03	pci/g	Yes	Yes	Yes	Yes		
SA12-30	RAD	Ra-226	1.44E+00	2.60E-03	pci/g	Yes	No		Yes		
SA12-0.5	RAD	Ra-226	1.16E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes		
SA12-20	RAD	Ra-226	1.84E+00	2.60E-03	pci/g	Yes	No		Yes		
SA15-20	RAD	Ra-226	1.43E+00	2.60E-03	pci/g	Yes	No		Yes		
SA15-0.5	RAD	Ra-226	1.19E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes		
SA16-30	RAD	Ra-226	1.71E+00	2.60E-03	pci/g	Yes	No		Yes		

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Table ___
EA06 Soil Sample Results Greater Than Comparison Levels for Direct Contact Pathways
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	Analyte Type	SRC	Concentration	Comparison Level (a)	Units	Is Concentration >Comparison Level?	Is Sample within 0-10 ft bgs? (b)	Is Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Direct Contact Pathways? (d)	SRCs to Evaluate in Phase B	Note
SA11-20	RAD	Ra-228	1.68E+00	1.50E-02	pci/g	Yes	No		Yes		
SA12-0.5	RAD	Ra-228	1.79E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes		
SA12-10	RAD	Ra-228	1.83E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes		
SA12-30	RAD	Ra-228	1.03E+00	1.50E-02	pci/g	Yes	No		Yes		
SA11-10	RAD	Ra-228	1.95E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes		
SA12-20	RAD	Ra-228	2.01E+00	1.50E-02	pci/g	Yes	No		Yes		
SA11-30	RAD	Ra-228	1.17E+00	1.50E-02	pci/g	Yes	No		Yes		
SA15-10	RAD	Ra-228	1.90E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes		
SA15-20	RAD	Ra-228	1.84E+00	1.50E-02	pci/g	Yes	No		Yes		
SA15-0.5	RAD	Ra-228	2.11E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes		
SA11-0.5	RAD	Ra-228	1.84E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes		
SA16-20	RAD	Ra-228	2.07E+00	1.50E-02	pci/g	Yes	No		Yes		
SA16-10	RAD	Ra-228	1.50E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes		
SA15-30	RAD	Ra-228	7.77E-01	1.50E-02	pci/g	Yes	No		Yes		
SA16-0.5	RAD	Ra-228	1.92E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes		
SA15-35	RAD	Ra-228	8.52E-01	1.50E-02	pci/g	Yes	No		Yes		
SA16-30	RAD	Ra-228	1.17E+00	1.50E-02	pci/g	Yes	No		Yes		
SA15-10	RAD	Th-228	8.24E-01	2.55E-02	pci/g	Yes	Yes	Yes	Yes		
SA11-10	RAD	Th-228	6.63E-01	2.55E-02	pci/g	Yes	Yes	Yes	Yes		
SA11-10	RAD	URANIUM-238	3.70E-01	1.80E-01	pci/g	Yes	Yes	Yes	Yes		
SA15-10	RAD	URANIUM-238	3.84E-01	1.80E-01	pci/g	Yes	Yes	Yes	Yes		
SA15-0.5	SVOC	Hexachlorobenzene	3.10E-01	1.08E-01	mg/kg	Yes	Yes	No	Yes		(h)
SA15-10	SVOC	Hexachlorobenzene	1.78E-01	1.08E-01	mg/kg	Yes	Yes	No	Yes		(h)
SA11-0.5	SVOC	Hexachlorobenzene	5.75E-01	1.08E-01	mg/kg	Yes	Yes	No	Yes		(h)
SA11-0.5	TPH	Oil Range Organics	5.00E+01	1.00E+01	mg/kg	Yes	Yes	No	Yes		(e)
SA11-20	VOC	Chloroform	4.80E-02	4.70E-02	mg/kg	Yes	No		Yes		
SA16-30	VOC	Chloroform	2.40E-01	4.70E-02	mg/kg	Yes	No		Yes		
SA11-0.5	VOC	Chloroform	1.40E-01	4.70E-02	mg/kg	Yes	Yes	No	Yes		(h)
SA12-30	VOC	Chloroform	5.60E-02	4.70E-02	mg/kg	Yes	No		Yes		
NA	Asbestos	Asbestos	NA	NA	NA	NA	NA	NA	No	Asbestos	(i)

Notes:
bgs - below ground surface.
ft - feet.
ID - Identification.
NA - Not applicable.
RAD - Radionuclide.
TPH - Total Petroleum Hydrocarbons.
VOC - Volatile Organic Compound.
SRC - Site-Related Chemical.
(a) See Table 5-1 for comparison levels, as well as references, footnotes and synonyms.
(b) Direct contact with soils assumed only to occur within the 0-10 ft bgs depth interval.
(c) See Section___ and Table ___.
(d) See Section___.
(e) Concentration less than NDEP 100 mg/kg action level. See Table 5-1.
(f) Reported result is from 8290 screen method; full 8290 result = 894 ng/kg which is less than the comparison level.
(g) Sample result is only slighty above the comparison level, which is 1/10 the industrial soil PRG (see (a)). See Table 5-1.
(h) Sample results are less than 10-fold higher than the comparison level, which is 1/10 the industrial soil PRG. See Table 5-1.
(i) See Section _ and Table 6-5.

Crowley, Susan

From: Crowley, Susan
Sent: Monday, July 02, 2007 4:37 PM
To: Paul Black; dgratson@neptuneinc.org; Brian Rakvica (brakvica@ndep.nv.gov)
Cc: Bailey, Keith
Subject: Tronox Analytical Database

Paul, Dave and Brian,
Under separate cover, via overnight mail you should receive a CD which holds a copy of the Tronox analytical database. Brian knows this – but for others .... The database consists of four electronic files. You will see a relational database file and a flat file for two bodies of information, 1) the GW monitoring / compliance sampling and 2) the Phase A and Upgradient sampling done to date. Please call me if you have any questions at all. Thanks.

Susan Crowley
TRONOX LLC
PO Box 55
Henderson, NV 89009
p 702.651.2234
ef 405.302.4607
email susan.crowley@tronox.com

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

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 2, 2007

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to:
Quarterly Performance Report, Perchlorate Recovery System, Henderson, Nevada January – March 2007 dated May 29, 2007

Dear Ms. Crowley,

The NDEP has received and reviewed above-identified TRX report (1st Quarter 2007 Report). Comments have been provided in Attachment A. Please provide a fully annotated response to comments letter as an Appendix the Semi-Annual Performance Report for Chromium and Perchlorate for January – June, 2007.

Please contact the undersigned with any questions at 702-486-2850 x 240 or sharbour@ndep.nv.gov.

Sincerely,

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

CC: Jim Najima, NDEP, BCA, Carson City
Brian Rakvica, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Keith Bailey, Tronox, Inc, PO Box 268859, Oklahoma City, Oklahoma 73126-8859
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
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
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Mark Paris, Landwell, 875 West Warm Springs, Henderson, NV 89011
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, CO 80402
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, CA 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110
Paul Hackenberry, Hackenberry Associates, LLC, 550 W. Plumb Lane B425, Reno, Nevada 89509

Attachment A

1. General comment, please note that the March 29, 2007 NDEP Comments on the Semi-Annual Performance Report Dated February 26, 2007(2nd Semi-Annual 2006 Report) must be additionally applied to the Quarterly Performance Reports as applicable. This includes any similar tables and figures.
2. Section 1.0, last paragraph, include both the mass perchlorate removed per quarter and the mass perchlorate removed per day for the on-Site well field, Athens Road well field, seep area well field, and the grand total.
3. Section 2.0, first paragraph, last sentence, please explain the significance of comparing the current interceptor well field extraction rate to the 65 gpm rate that is cited.
4. Section 3.0, pg 3-2, second paragraph, the NDEP acknowledges that ARP-4, ARP-5, and ARP-6 have been temporarily abandoned for 6 to 9 months. Please continue to update the status of these piezometers in future Quarterly and Semi-Annual Performance Reports until these piezometers have been reestablished.
5. Tables, Table 2, please clarify the relationship between wells ART-6 and ART-9 via a footnote on this table.
6. Figures, the NDEP has the following comments:
    a. Figure 1, this Figure is not legible. It is not possible to discern the locations of many of the wells. Please provide this Figure on a larger sized piece of paper in the future.
    b. Figure 7, NDEP notes that based upon a review of this Figure it appears that no appreciable change in perchlorate concentration has occurred since 2001. This suggests a continuing source.
    c. Figure 8, see comment for Figure 7.
    d. Figure 14, due to the scale of this Figure it is not possible to discern any meaning. Please modify the scale in future submittals or provide two Figures with different time frames covered.
7. Appendix A, the depth to groundwater and groundwater elevations for the November 2006 sampling event reported in the 2nd Semi-Annual 2006 Report do not match several November 2006 values reported in the 1st Quarter 2007 Report. This was especially noted for the "ART" and "I" designated wells. Errata for Appendix A must be submitted with TRX's response to comments (RTC).
8. Appendix B, the NDEP has the following comments:
    a. Well M-48, it is noted that this well is downgradient of the slurry wall. Please explain what appears to be a continuing source of >200 mg/l perchlorate to this well.
    b. Well M-69, please explain the increasing concentrations in this well which is located on the western edge of the plume.
9. Appendix C, Database, Qualifiers, there are two columns of qualifiers in the database, "lab_qualifiers" and "validator_qualifiers." It is not always clear which of these was used to determine the final qualifier. It would seem that the validator_qualifier should be the final qualifier. Also, many "u" and "ud" lab_qualifiers do not have a qualifier in the validator_qualifier column. For completeness the report should clarify what the final qualifier is and how the lab_qualifiers are used.
10. Appendix C, Laboratory Reports, General Comment, a laboratory report is incomplete without a Case Narrative (or similar discussion of sample conditions and deviations from quality) and Chain of Custody (COC). Most of the laboratory reports submitted appears to have no Case Narrative - the Report Comments pages are blank (and unsigned), and the COC is missing for laboratory reports 198847.pdf, 198415.pdf, and possibly others. The DVSR should provide clarification as to why this information is missing. The DVSR is incomplete without all COCs.

11. Appendix D, RTC, general comment, this response to comments section should also be included in the 1st Semi-Annual 2007 Report.
12. Appendix D, RTC 7, according to Table 4 in the 1st Quarterly 2007 Report, Athens Rd well field exhibited a decrease of 106 pounds per day between June 2006 and July 2006 followed by an increase of 110 pounds per day between August 2006 and September 2006, which is when TRX reports that ART-9 became operational. Please discuss the cause(s) of the 106 pounds per day decrease and how this relates to the 110 pound per day increase two months later.
13. Appendix D, RTC 10.a, check the location of the vertical scale on Figure 2 of the 2nd Semi-Annual 2006 Report for accuracy. If the actual groundwater elevation of I-K is 1713.75, as reported by TRX, the vertical scale on Figure 2 shows that this elevation is still below the screened interval.
14. Appendix D, RTC 10.f.i-vii, the NDEP acknowledges that TRX collects samples from 50 sampling points on the interim groundwater treatment system and that illustrating these on the current Figure 7 would significantly decrease legibility of the figure. Therefore, please increase the size of Figure 7 and use footnotes to illustrate where the sampling points are located, what analyses are being conducted at each sampling point, and the frequency of sampling at each point. Please include these revisions in the 1st Semi-Annual 2007 Performance Report.
15. Appendix D, RTC 11.c, TRX's RTC does not address NDEP's original comment. Therefore, provide an explanation and discussion on the increasing total chromium outflow concentrations in the 1st Semi-Annual 2007 Performance Report. The discussion must include a schedule for how TRX plans to mitigate this issue.
16. Appendix D, RTC 11.e, please include and denote any estimated data in this table.
17. Appendix D, RTC 12.c, please include and denote any estimated data in Plate 3.
18. Appendix D, RTC 15.b.ii, please submit a schedule for and clarification on the intended procedures for the recommended pump test on M-71 and M-72. This item can be completed via an e-mail to the NDEP.
19. Appendix D, RTC 15.b.iii, the NDEP acknowledges that the current detection limit for total chromium is 0.02 mg/L. Please include a contour line for 0.02 mg/L on the Total Chromium in Groundwater map commencing with 1st Semi-Annual 2007 Report. If TRX believes that the 0.02 mg/l contour line is not plausible, please discuss this matter with the NDEP.
20. Appendix E, Section 1.0, Introduction, Sample and Analysis Clarification, the database provided with this DVSR includes all data from first quarter 2006 to first quarter 2007. This complicates review of the report and references provided in the report. For example, there are three different methods in the database for Chromium-Hexavalent, but only one of these methods appears to be relevant to this DVSR.
    a. In this section, provide a list of the analytes for which analyses were performed and the samples (e.g., 20 groundwater samples) that were analyzed included in this Performance Report.
    b. The report should include a table that shows the sample IDs (in rows) and the analytes (in columns) for which these samples were analyzed.
21. Appendix E, Section 1.0, Introduction, include a statement that all samples were filtered for all analyses, or if not all analyses, include for which analyses the samples were filtered.
22. Appendix E, Section 2.0, Data Validation Process, page 1, after the bullets, the DVSR refers to "the non-CLP methodologies." Please write out the acronym the first time it is used.
23. Appendix E, Section 2.0, the DVSR states, "The results contained in the lab reports listed in the data validation memorandum were subjected to thorough data review rather than formal full data validation as recommended in the guidance on data validation provided by NDEP for the BMI Plant Sites (NDEP, 2006). MWH did not provide complete data packages with raw data for the reviewed results and therefore, verification of the initial and continuing calibrations and other elements in the Tier 2 list beyond batch quality control (QC) were not available for review." The analytical laboratory, MWH,

should be required to provide data that allows validation to Tier 3 to meet the data validation guidance provided by NDEP.

24. Appendix E, Section 3.1, Holding Time and Sample Preservation and Table E-3, Table E-3 indicates a number of results were qualified due to holding time. However, both a J and a J- qualifier are used with no obvious distinction. This section should explain the logic for qualifying results as J- versus J.
25. Appendix E, Section 3.2, Blank Contamination, the memorandum included with this report, dated May 1, 2007 (file: TH1stqtr2007.pdf) indicates blank contamination was identified in two blanks. The DVSR should include a discussion of both blanks.
26. Appendix E, Section 4.1, Precision, paragraph 2, change "LSC/LCSD pairs" to "LCS/LCSD pairs."
27. Appendix E, Section 4.5, Comparability, this section should include the methods used for each analyte or suite of analytes, especially since multiple methods were included. It is noted that this information is in the memorandum dated May 1, 2007 (file: TH1stqtr2007.pdf) but should also be included in the DVSR. Also, two methods for total chromium are shown in the memorandum. The DVSR should explain why there were two methods used and discuss their comparability.
28. Appendix F, the NDEP does not find the information provided in this appendix useful without a corresponding map(s). The map(s) must include all wells listed on the proposed sampling plan and be color-coded with respect to sampling frequency with another map color-coded with respect to chemical analysis. Please submit these items in the 1st Semi-Annual 2007 Report.

ISSUES
7/6/07

Meeting Minutes

Project: Tronox (TRX)
Location: Tronox Henderson Facility
Time and Date: 9:00 AM, Thursday, June 28, 2007
In Attendance: NDEP-BCA – Brian Rakvica
Teri Copeland – for NDEP
Tronox – Keith Bailey
ENSR (for TRX) – Dave Gerry, Elizabeth Perry, Lisa Bradley, Robert Kennedy

CC: Jim Najima, Shannon Harbour, Susan Crowley, Paul Black, Paul Hackenberry

1. The meeting was held to discuss a variety of topics including the Phase A Report and Phase B Work Plan.
2. TRX provided a number of draft tables and figures for discussion purposes via e-mail.
3. Background information provided by TRX as follows:
    a. Over 120 soil samples and 27 groundwater (GW) samples were collected during Phase A. These were analyzed for over 250 compounds per sample.
    b. Many of these compounds were never detected. It was noted that there are very few issues with the detection limits for soils data.
    c. Discussed the derivation of direct contact levels
        i. Soils are 1/10 the PRG
        ii. GW – USEPA MCL, NC action level or 1/10 the PRG
        iii. TRX also has derived a list of soil screening levels for leaching (SSLs) and is using the USEPA vapor intrusion (VI) levels.
        iv. **ACTION ITEM:** TRX to provide the list of SSLs in a table similar to what NDEP reviewed previously and the reference for the VI levels.
4. Discussed Table 5-20A (soils)
    a. It was noted that the analytes listed on this table are ones that had a maximum concentration greater than the direct contact level or SSL.
    b. It was agreed that formal COPC selection will occur at the time of risk assessment.
    c. Discussed organophosphorous pesticides (OP pests) – TRX noted that these are proposed not be evaluated further because there were only 2 detections and they were very low (less than 1/10 the PRG). In addition:
        i. They were not detected in GW
        ii. There is a low site-wide frequency of detection (FOD)
    d. Discussed radionuclides. These are consistent with background. NDEP noted elevated concentrations in GW in exposure area (EA) 8. TRX is investigating the issue of filtered versus non-filtered samples. NDEP noted that there is a source that has not yet been identified.
    e. Discussed SVOCs and PAHs, the frequency of detection is very low and the detections are very close to 1/10 the PRG. It was noted that this issue should be correlated to the area of historic diesel releases.

f. Discussed TPH, TRX proposes to eliminate. NDEP noted that this does not consider the historic data in the vicinity of the diesel tanks. TRX to review.

5. Discussed table 5-21A (GW)
    a. No analytes were removed.
6. Discussed background analyses.
    a. TRX to revised histograms to separate upgradient from background data.
    b. Histograms and background statistics show that arsenic is above background in a small subset of locations (the remainder are consistent with background) and radium is not above background.
7. Discussed Table EA-9 and EA-9 figure, this is a table that evaluates data for EA 9.
    a. Table presents all results that are higher than the direct contact level.
    b. Table does not address leaching.
    c. Noted that asbestos will be evaluated versus a construction worker scenario. It was noted that this is more conservative than the chronic industrial worker scenario.
    d. This table shows that the driver chemicals appears to be arsenic, perchlorate and asbestos.
    e. Soil gas samples will be located next to selected buildings to address exposure issues as well as next to the two wells sampled in this EA.
    f. It was noted that GW will be evaluated on a site-wide basis not on an EA basis.
    g. TRX noted that samples were located to develop a representative EPC (scattered throughout the EA).
    h. NDEP noted that this does not address the need to identify the location and extent of the source areas.
        i. TRX does not think this is necessary at this stage.
        ii. NDEP noted that it is necessary to make remedial decisions and that leaching data is also necessary.
        iii. TRX noted that additional sampling may occur in the future to address these issues, i.e., where a constituent is identified for a remedy, sampling can be done as part of the remedial action plan to identify the extent of the area to be addressed by the remedy.
8. TRX noted that the leaching pathway <u>will</u> be addressed in the report and that they have not completed this analysis yet. It is expected that this may be discussed on the conference call scheduled for July 13, 2007 at 11:00 AM Pacific.
9. For future Phase B Site Investigation work, TRX is proposing to not report individual analytes within a suite that are not identified as drivers in the Phase A results. For example, VOCs such as chloroform and benzene would be reported, but other VOCs which were either not detected or were found at levels below 0.1 times the PRGs would not be reported by the labs. This would reduce costs for data validation and database management. NDEP does not agree and will review internally.
10. Discussed Phase II investigation for redevelopment areas.
    a. TRX to provide BRC with Tables 5-20A and 5-21A as well as all of the data from the Site and a Site map.

Brian Rakvica

From: Bailey, Keith [Keith.Bailey@tronox.com]
Sent: Thursday, June 28, 2007 8:33 AM
To: Brian Rakvica; Shannon Harbour; TeriLCopeland@aol.com; Gerry, Dave; Bradley, Lisa; Crowley, Susan
Subject: FW: Examples for NDEP Call
Attachments: NDEP 6-28-07.pdf

Brian, Shannon, and Teri,

The attached pdf file contains draft examples from the ongoing Tronox Phase A work, which we will discuss on our conference call this morning at 9:00 am PDT.

I suggest that you print them on the largest paper you have (preferably 11x17) since some of them contain a lot of information.

Repeating from yesterday's e-mail, the call-in number is:

1-866-231-9615
Participant: 336732
Host: 147516

Please let me know that you have received the information by an e-mail response.

Thanks.

Keith Bailey

Table 5-20A
Summary of SRC Results in Soil Above Direct Contact and SSL Comparison Levels
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

DRAFT

Analyte Type / Analytical Method / SRC	Max Conc. > Direct Contact Comparison Level (a)	Max Conc. > SSL Comparison Level (b)	Consistent with Background ?	Proposed Phase B SRC List
Metals				
SW 846 6020				
Antimony		X	No	X
Arsenic	X	X	No	X
Boron		X	No	X
Chromium	X	X	No	X
Lead	X	X	No	X
Manganese	X	X	No	X
Strontium		X	No	X
SW 846 7199				
CR, Hexavalent	X	X	No	X
Perchlorate				
EPA 314.0				
Perchlorate	X	X	No	X
O. Pesticides				
SW846 8141A				
Dimethoate		X	NA	No (e)
Pesticide				
SW 846 8081				
Beta-BHC	X	X	NA	X
RAD				
HASL-300 gamma				
Ra-226	X	--	Yes	No
Ra-228	X	--	Yes	No
HASL-300 TH MOD				
Th-228	X	--	Yes	No
Th-230	X	--	Yes	No
HASL-300 U MOD				
URANIUM-235/236	X	--	Yes	No
URANIUM-238	X	--	Yes	No
SVOC				
SW 846 8270				
Benzo(a)pyrene	X		NA	No (e)
Hexachlorobenzene	X		NA	No (e)
TPH				
SW 846 8015B DRO				
Oil Range Organics	X	--	NA	No (e)
Total petroleum hydrocarbon-diesel	X	--	NA	No (e)
VOC				
SW 846 8260				
Benzene	X	X	NA	X
Chlorobenzene		X	NA	X
Chloroform	X	X	NA	X
Methylene chloride		X	NA	X
Asbestos				
540/R-97/028				
Asbestos	(d)	--	NA	X
Chemistry				
SW 846 9056				
Chloride	NA	(c)	TBD	X
Nitrate	NA	(c)	TBD	X
Sulfate	NA	(c)	TBD	X
Sodium	NA	(c)	TBD	X
Calcium	NA	(c)	TBD	X

Notes:
NA - Not Applicable.
SRC - Site-Related Chemical.
SSL - Soil Screening Level (soil to groundwater pathway).
TBD - To be determined.
-- - Not evaluated for that pathway.
blank - SRC maximum concentration not above comparison level.
(a) See Table 5-10.
(b) See Table 5-15.
(c) Soil to groundwater pathway assumed to be complete due to high solubility.
(d) See Table 6-5.
(e) See text.

DRAFT

Table 5-21A

Summary of SRC Results in Groundwater Above Direct Conctact and VI Comparison Levels

Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/ Analytical Method SRC	Max Conc. > Direct Contact Comparison Level (a)	Max Conc. > VI Comparison Level (b)	Proposed Phase B SRC List for Groundwater	Proposed Phase B SRC List for Soil Gas
Chemistry				
EPA 160.1				
Total Dissolved Solids	X	--	X	
SW 846 9056				
Chloride	X	--	X	
Nitrate	X	--	X	
Nitrite	X	--	X	
Sulfate	X	--	X	
Metals				
SW 846 6020				
Aluminum	X	--	X	
Arsenic, dissolved	X	--	X	
Arsenic	X	--	X	
Barium	X	--	X	
Beryllium	X	--	X	
Boron, dissolved	X	--	X	
Boron	X	--	X	
Cadmium	X	--	X	
Chromium	X	--	X	
Cobalt	X	--	X	
Iron	X	--	X	
Lead	X	--	X	
Magnesium, dissolved	X	--	X	
Magnesium	X	--	X	
Manganese, dissolved	X	--	X	
Manganese	X	--	X	
Molybdenum, dissolved	X	--	X	
Molybdenum	X	--	X	
Nickel	X	--	X	
Strontium, dissolved	X	--	X	
Strontium	X	--	X	
Thallium	X	--	X	
Uranium, dissolved	X	--	X	
Uranium	X	--	X	
Vanadium, dissolved	X	--	X	
Vanadium	X	--	X	
SW 846 7199				
CR, Hexavalent	X	--	X	
Perchlorate				
EPA 314.0				
Perchlorate	X	--	X	

DRAFT

Table 5-21A

Summary of SRC Results in Groundwater Above Direct Conctact and VI Comparison Levels

Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Analyte Type/ Analytical Method SRC	Max Conc. > Direct Contact Comparison Level (a)	Max Conc. > VI Comparison Level (b)	Proposed Phase B SRC List for Groundwater	Proposed Phase B SRC List for Soil Gas
Pesticide				
SW 846 8081				
Alpha-BHC	X	X	X	X (c)
Beta-BHC	X		X	
Delta-BHC	X		X	
Gamma-BHC (Lindane)	X		X	
Heptachlor	X	X	X	X (c)
RAD				
Calculated				
Ra-226 & Ra-228	X	--	X	
HASL-300 TH MOD				
Th-228 - soluble	X	--	X	
Th-230 - soluble	X	--	X	
Th-232 - soluble	X	--	X	
HASL-300 U MOD				
URANIUM-233/234	X	--	X	
URANIUM-235/236	X	--	X	
URANIUM-238	X	--	X	
SVOC				
SW 846 8270				
1,4-Dioxane	X		X	
bis(2-Ethylhexyl)phthalate	X		X	
Naphthalene	X		X	
VOC				
SW 846 8260				
1,1-Dichloroethene	X		X	X
1,2-Dichlorobenzene	X	X	X	X
1,4-Dichlorobenzene	X	X	X	X
Benzene	X	X	X	X
Bromodichloromethane		X	X	X
Bromoform		X	X	X
Bromomethane	X		X	X
Carbon tetrachloride	X	X	X	X
Chlorobenzene	X	X	X	X
Chloroform	X	X	X	X
Chloromethane		X	X	X
Dibromochloromethane		X	X	X
Tetrachloroethene	X	X	X	X
Trichloroethene	X	X	X	X
Trichlorofluoromethane	X	X	X	X

Notes:

SRC - Site-Related Chemical.

VI - Vapor Intrusion.

-- - Not evaluated for that pathway.

blank - SRC maximum concentration not above comparison level.

(a) See Table 5-12.

(b) See Table 5-17.

(c) Methods may not exist for analysis in soil gas.

Results of Statistical Analyses
Phase A Investigation
Tronox, Henderson Nevada

	Phase A Results							Comparison to Upgradient/Background Datasets						
Analyte	n	FOD	Min	Max	Median	units	Shapiro-Wilk p	Slippage	Quantile 0.5	Quantile 0.75	Quantile 0.90	WRS	WRS A>bkgd	t-test
Shallow Soils (0-20 ft)														
As	95	100%	1.6	37	3.5	mg/kg	0.000	0.000	0.627	0.112	0.000	0.292	0.460	
Ra-226	94	96%	0.759	2.28	1.155	pCi/g	0.000	1.000	0.060	0.468	0.259	0.004	0.612	
Deep Soils (>20 ft)														
As	35	100%	3.1	61.6	18.9	mg/kg	0.002	0.029	0.044	0.014	0.029	0.052	0.643	
Ra-226	35	100%	1.18	7.49	1.71	pCi/g	0.000							

Notes
Shapiro-Wilk test: p values greater than the significance level (approximately 0.05) indicate normally distributed
Slippage test: Ho - that the two groups have similar right tails (that is, maximum values)
Ha - that the right tail of the Phase A data is greater than the right tail of the background dataset
Quantile tests: Ho - that the two groups have similar right tails (that is, above the percentile value shown)
Ha - that the right tail of the Phase A data is greater than the right tail of the background dataset
t-tests results provided only where Phase A datasets are normally distributed.
Ho - the means of the two groups are the same
Ha - the mean of Phase A data is greater than the mean of the background data
Wilcoxon rank sum test
Ho - the distribution of the two groups is similar
Ha - the distribution of the two groups is not the same
Results also provided showing the probability that the Phase A dataset is greater than the background dataset.
For all tests, if p<significance level, reject Ho and accept Ha.
Insufficient upgradient data to perform statistical calculations of radionuclides in deep soils.

Figure Stats-1 DRAFT

Comparison of Phase A and Background Data
As in Shallow Soils (up to 20 ft)

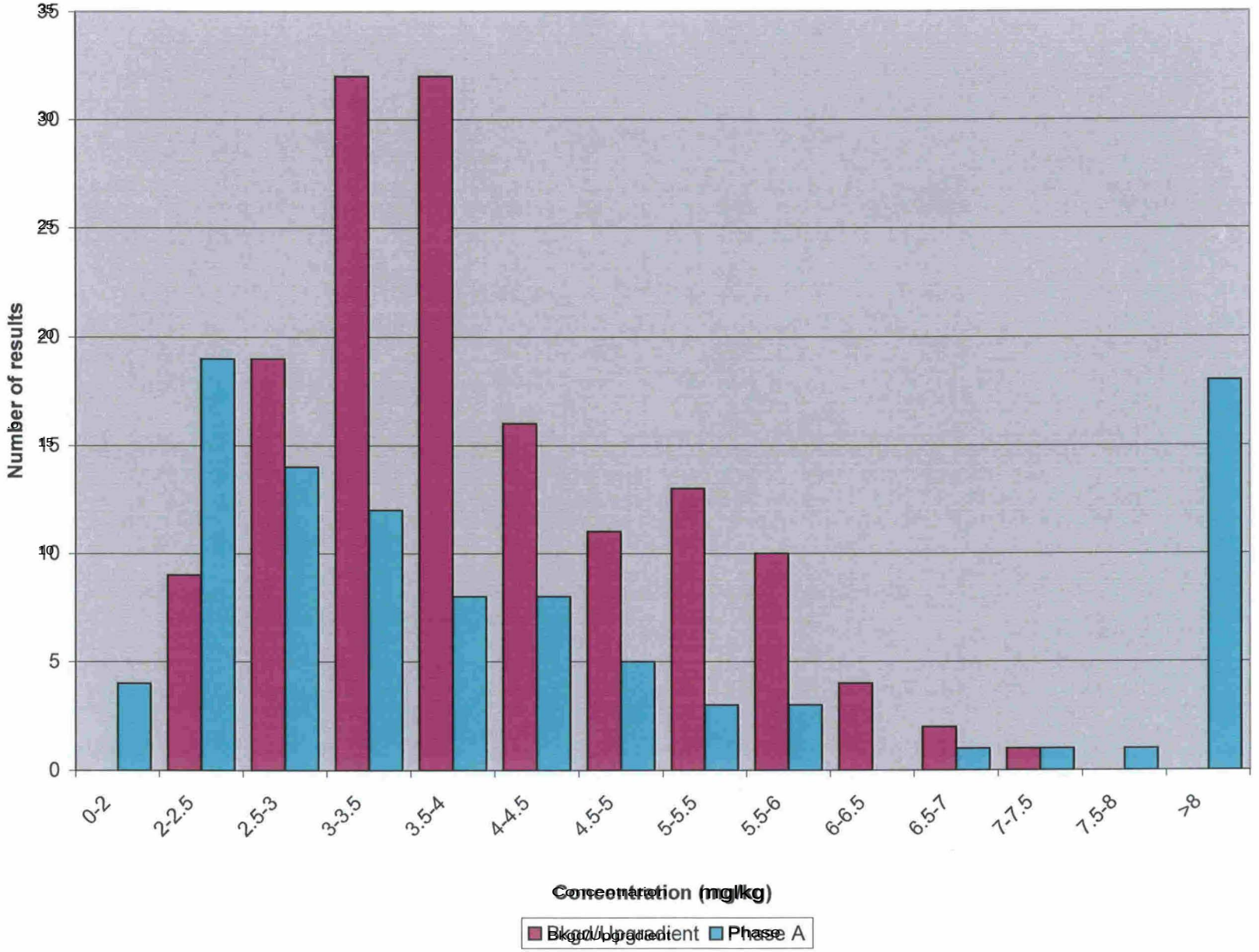


Figure Stats-2 DRAFT

Comparison of Phase A and Background Data
Arsenic in Deep Soils (20 ft)

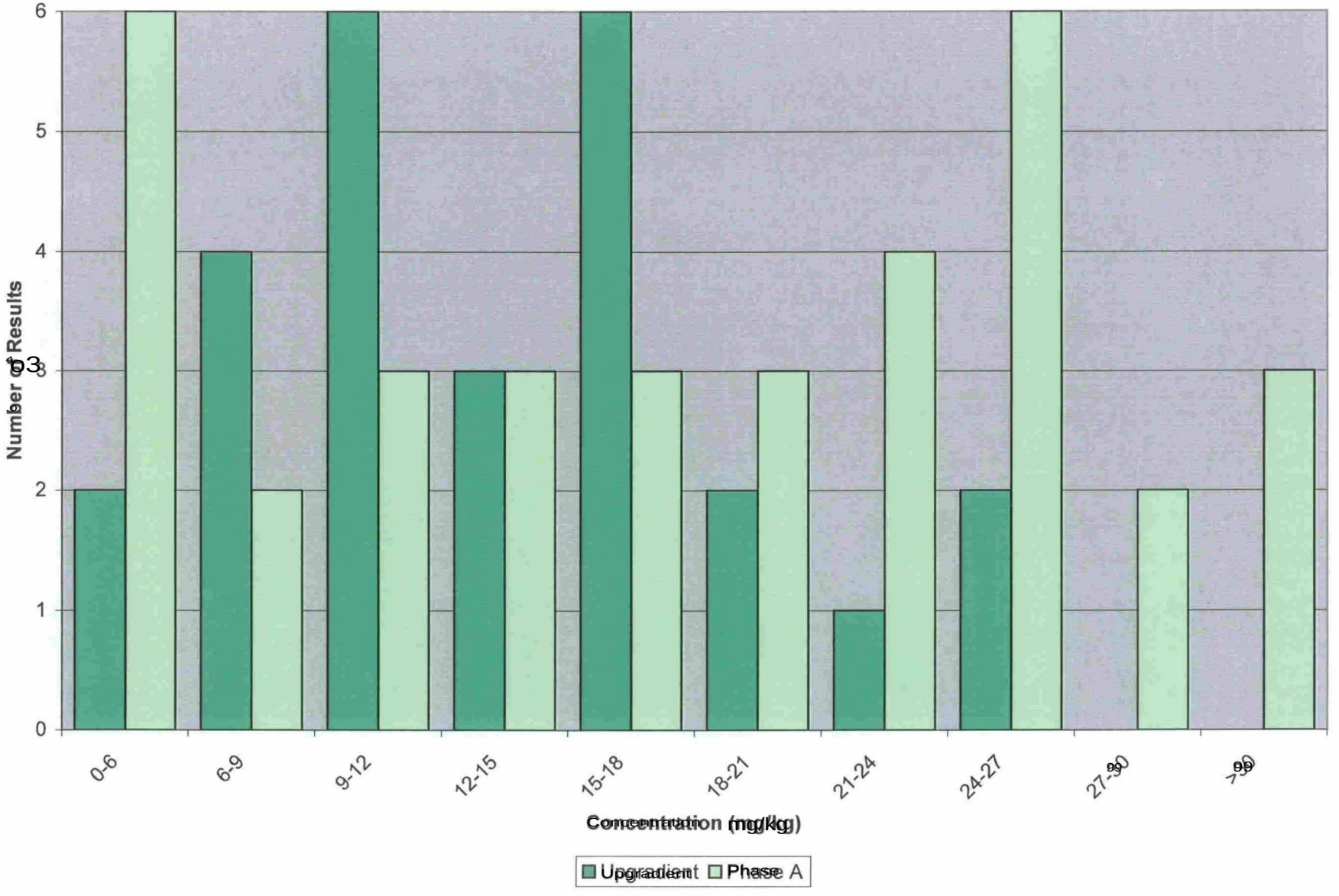


Figure Stats-3 DRAFT

Comparison of Phase A and Background Data
Ra-226 in Shallow Soils (up to 20 ft)

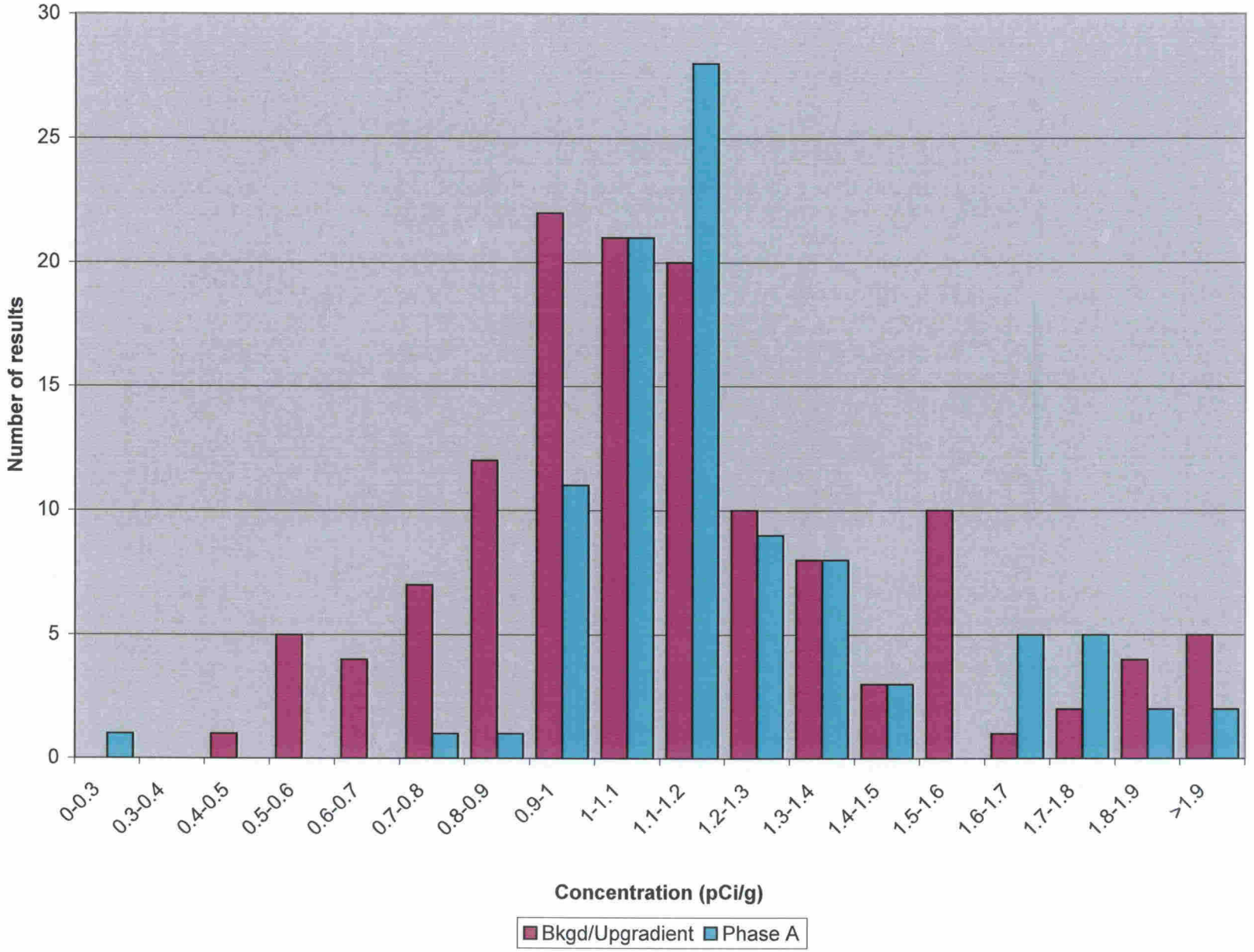


Table EA-9

Table ___
EA-9 Soil Sample Results Greater Than Comparison Levels for Direct Contact Pathways
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	Analyte Type	SRC	Concentration	Comparison Level (a)	Units	Is Concentration>Comparison Level?	Is Sample within 0-10 ft bgs? (b)	Is 0-10 ft bgs Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Direct Contact Pathways? (d)	SRCs to Evaluate in Phase B	Note
SA4-10	Metals	Arsenic	1.13E+01	1.59E-01	mg/kg	Yes	Yes	No	No	Yes	
SA3-0.5	Metals	Arsenic	3.20E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes	--	
SA3-10	Metals	Arsenic	3.00E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes	--	
SA4-0.5	Metals	Arsenic	1.34E+01	1.59E-01	mg/kg	Yes	Yes	Yes	Yes	--	
SA5-0.5	Metals	Arsenic	3.20E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes	--	
SA5-10	Metals	Arsenic	2.70E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes	--	
SA6-0.5	Metals	Arsenic	2.75E+00	1.59E-01	mg/kg	Yes	Yes	Yes	Yes	--	
SA3-20	Metals	Arsenic	3.50E+00	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA3-30	Metals	Arsenic	6.16E+01	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA3-40	Metals	Arsenic	2.77E+01	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA4-20	Metals	Arsenic	5.30E+00	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA4-30	Metals	Arsenic	6.10E+00	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA4-40	Metals	Arsenic	8.60E+00	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA5-20	Metals	Arsenic	2.50E+00	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA5-30	Metals	Arsenic	1.09E+01	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA5-37	Metals	Arsenic	2.76E+01	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA6-10	Metals	Arsenic	3.10E+00	1.59E-01	mg/kg	Yes	Yes	--	Yes	--	
SA6-20	Metals	Arsenic	4.00E+00	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA6-30	Metals	Arsenic	4.20E+00	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA6-35	Metals	Arsenic	2.44E+01	1.59E-01	mg/kg	Yes	No	--	Yes	--	
SA5-37	VOC	Chloroform	1.20E-01	4.70E-02	mg/kg	Yes	No	--	Yes	--	
SA5-30	Metals	CR, Hexavalent	8.40E+00	6.41E+00	mg/kg	Yes	No	--	Yes	--	
SA4-0.5	TPH	Oil Range Organics	4.30E+01	1.00E+01	mg/kg	Yes	Yes	No	Yes	--	(e)
SA3-10	Perchlorate	Perchlorate	1.02E+01	1.00E+01	mg/kg	Yes	Yes	No	No	Yes	
SA5-0.5	Perchlorate	Perchlorate	1.49E+01	1.00E+01	mg/kg	Yes	Yes	No	No	Yes	
SA5-10	Perchlorate	Perchlorate	1.12E+02	1.00E+01	mg/kg	Yes	Yes	No	No	Yes	
SA4-30	Perchlorate	Perchlorate	4.28E+01	1.00E+01	mg/kg	Yes	No	--	Yes	--	
SA4-40	Perchlorate	Perchlorate	7.39E+01	1.00E+01	mg/kg	Yes	No	--	Yes	--	
SA5-20	Perchlorate	Perchlorate	6.64E+01	1.00E+01	mg/kg	Yes	No	--	Yes	--	
SA5-30	Perchlorate	Perchlorate	1.91E+01	1.00E+01	mg/kg	Yes	No	--	Yes	--	
SA5-37	Perchlorate	Perchlorate	3.75E+02	1.00E+01	mg/kg	Yes	No	--	Yes	--	
SA6-35	Perchlorate	Perchlorate	5.41E+01	1.00E+01	mg/kg	Yes	No	--	Yes	--	
SA3-0.5	RAD	Ra-226	1.06E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes	--	
SA3-10	RAD	Ra-226	1.01E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes	--	
SA4-0.5	RAD	Ra-226	1.10E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes	--	
SA4-10	RAD	Ra-226	1.13E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes	--	
SA5-0.5	RAD	Ra-226	1.12E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes	--	
SA5-10	RAD	Ra-226	1.07E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes	--	
SA6-0.5	RAD	Ra-226	1.25E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes	--	
SA6-10	RAD	Ra-226	1.07E+00	2.60E-03	pci/g	Yes	Yes	Yes	Yes	--	
SA3-20	RAD	Ra-226	1.19E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA3-30	RAD	Ra-226	1.59E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA3-40	RAD	Ra-226	2.34E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA4-20	RAD	Ra-226	1.19E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA4-30	RAD	Ra-226	1.45E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA4-40	RAD	Ra-226	1.60E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA5-20	RAD	Ra-226	1.10E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA5-30	RAD	Ra-226	2.29E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA5-37	RAD	Ra-226	2.46E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA6-20	RAD	Ra-226	1.21E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA6-30	RAD	Ra-226	1.49E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA6-35	RAD	Ra-226	2.10E+00	2.60E-03	pci/g	Yes	No	--	Yes	--	
SA3-0.5	RAD	Ra-228	1.46E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes	--	
SA3-10	RAD	Ra-228	1.65E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes	--	
SA4-0.5	RAD	Ra-228	1.83E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes	--	
SA4-10	RAD	Ra-228	1.81E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes	--	
SA5-0.5	RAD	Ra-228	1.92E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes	--	
SA5-10	RAD	Ra-228	1.66E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes	--	
SA6-0.5	RAD	Ra-228	1.88E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes	--	
SA6-10	RAD	Ra-228	1.80E+00	1.50E-02	pci/g	Yes	Yes	Yes	Yes	--	
SA3-20	RAD	Ra-228	1.66E+00	1.50E-02	pci/g	Yes	No	--	Yes	--	
SA4-20	RAD	Ra-228	1.53E+00	1.50E-02	pci/g	Yes	No	--	Yes	--	
SA4-30	RAD	Ra-228	1.91E+00	1.50E-02	pci/g	Yes	No	--	Yes	--	
SA4-40	RAD	Ra-228	1.90E+00	1.50E-02	pci/g	Yes	No	--	Yes	--	
SA5-20	RAD	Ra-228	1.52E+00	1.50E-02	pci/g	Yes	No	--	Yes	--	
SA5-30	RAD	Ra-228	1.68E+00	1.50E-02	pci/g	Yes	No	--	Yes	--	
SA5-37	RAD	Ra-228	8.06E-01	1.50E-02	pci/g	Yes	No	--	Yes	--	

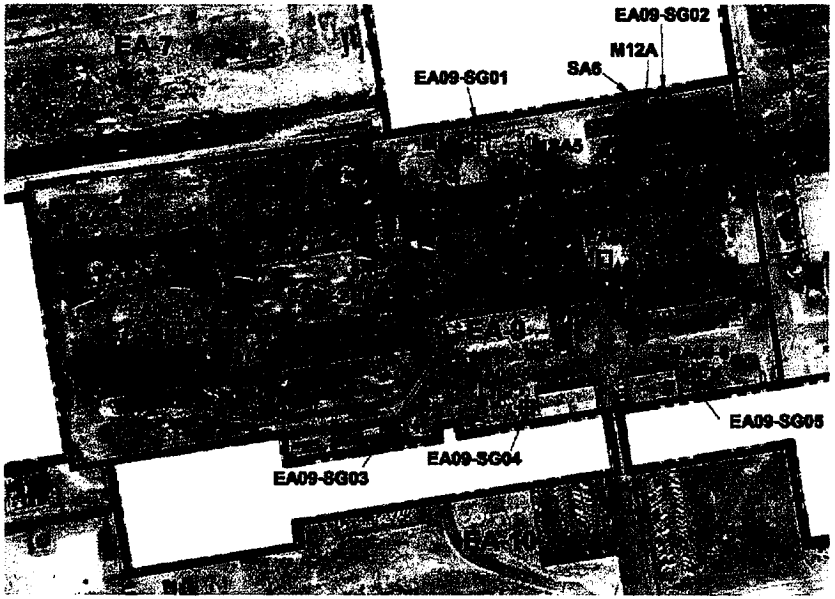
Table EA-9

Table ___
EA-9 Soil Sample Results Greater Than Comparison Levels for Direct Contact Pathways
Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada

Sample ID	Analyte Type	SRC	Concentration	Comparison Level (a)	Units	Is Concentration>Comparison Level?	Is Sample within 0-10 ft bgs? (b)	Is 0-10 ft bgs Sample Concentration Consistent with Background? (c)	Is Characterization Adequate for Direct Contact Pathways? (d)	SRCs to Evaluate in Phase B	Note
SA6-20	RAD	Ra-228	1.63E+00	1.50E-02	pci/g	Yes	No	--	Yes	--	
SA6-30	RAD	Ra-228	1.94E+00	1.50E-02	pci/g	Yes	No	--	Yes	--	
SA3-10	RAD	Th-228	6.91E-01	2.55E-02	pci/g	Yes	Yes	Yes	Yes	--	
SA6-10	RAD	Th-228	6.01E-01	2.55E-02	pci/g	Yes	Yes	Yes	Yes	--	
SA4-20	RAD	Th-228	5.11E-01	2.55E-02	pci/g	Yes	No	--	Yes	--	
SA5-30	RAD	Th-228	4.81E-01	2.55E-02	pci/g	Yes	No	--	Yes	--	
SA5-30	RAD	Th-230	2.23E+00	2.02E+00	pci/g	Yes	No	--	Yes	--	
SA5-30	RAD	URANIUM-235/236	4.69E-02	3.98E-02	pci/g	Yes	No	--	Yes	--	
SA3-10	RAD	URANIUM-238	2.92E-01	1.80E-01	pci/g	Yes	Yes	Yes	Yes	--	
SA6-10	RAD	URANIUM-238	4.83E-01	1.80E-01	pci/g	Yes	Yes	Yes	Yes	--	
SA4-20	RAD	URANIUM-238	8.33E-01	1.80E-01	pci/g	Yes	No	--	Yes	--	
SA5-30	RAD	URANIUM-238	1.37E+00	1.80E-01	pci/g	Yes	No	--	Yes	--	
NA	NA	Asbestos	NA	NA	NA	NA	NA	NA	NA	Yes	(f)

Notes:
bgs - below ground surface.
ft - feet.
ID - Identification.
RAD - Radionuclide.
TPH - Total Petroleum Hydrocarbons.
VOC - Volatile Organic Compound.
SRC - Site-Related Chemical.
(a) See Table 5-1 for comparison levels, as well as references, footnotes and synonyms.
(b) Direct contact with soils assumed only to occur within the 0-10 ft bgs depth interval.
(c) See Section___ and Table ___.
(d) See Section___.
(e) Concentration less than NDEP 100 mg/kg action level. See Table 5-1.
(f) Based on asbestos risk assessment results, see Section ___.

DRAFT



LEGEND

- PROPERTY BOUNDARY
- EVALUATION AREA BOUNDARY
- PHASE A BORING LOCATION
- PHASE A WELL
- PHASE A COMBINED BORING LOCATION AND GROUNDWATER GRAB SAMPLE LOCATION
- PHASE B PROPOSED SOIL SAMPLE LOCATION
- PHASE B PROPOSED SOIL GAS SAMPLE LOCATION

NOTES

SOIL SAMPLES WILL BE COLLECTED AT 0-FT, 0.5-FT, AND 10-FT BGS.

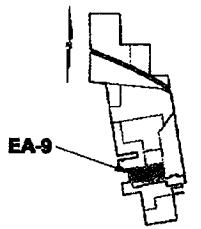
SURFACE SOIL SAMPLES (0-FT BGS) WILL BE ANALYZED FOR ASBESTOS.

SOIL FROM 0.5-FT BGS WILL BE ANALYZED FOR METALS AND PERCHLORATE.

SOIL FROM 10-FT BGS WILL BE ANALYZED FOR METALS, PERCHLORATE

SOIL GAS SAMPLES WILL BE COLLECTED AT 5-FT BGS (EXCEPT EA09-SG03) AND ANALYZED FOR VOCs (EPA METHOD TO-15).

EA09-SB03 WILL BE COLLECTED AT 20-FT BGS AND ANALYZED FOR VOCs



INDEX MAP OF EVALUATION AREAS

0 125' 250' 500'

SCALE IN FEET

N

REVISIONS			
NO.	DESCRIPTION:	DATE:	BY:

DESIGNED BY:	L. Bradley
DRAWN BY:	M. Scop
CHECKED BY:	B. Ho
APPROVED BY:	B. Ho

ENSR | AECOM
ENSR CORPORATION
1220 AVENIDA ACASO
CAMARILLO, CALIFORNIA 93012
PHONE: (805) 388-3775
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PHASE B PROPOSED SAMPLE LOCATIONS EVALUATION AREA 9

Source Area Investigation - Phase A
Tronox Facility
Henderson, Nevada

SCALE:	DATE:	PROJECT NUMBER:
1" = 250'	6/19/2007	04020-020-002

FIGURE NUMBER:
6-10

SHEET NUMBER:
X

FILENAME:

Brian Rakvica

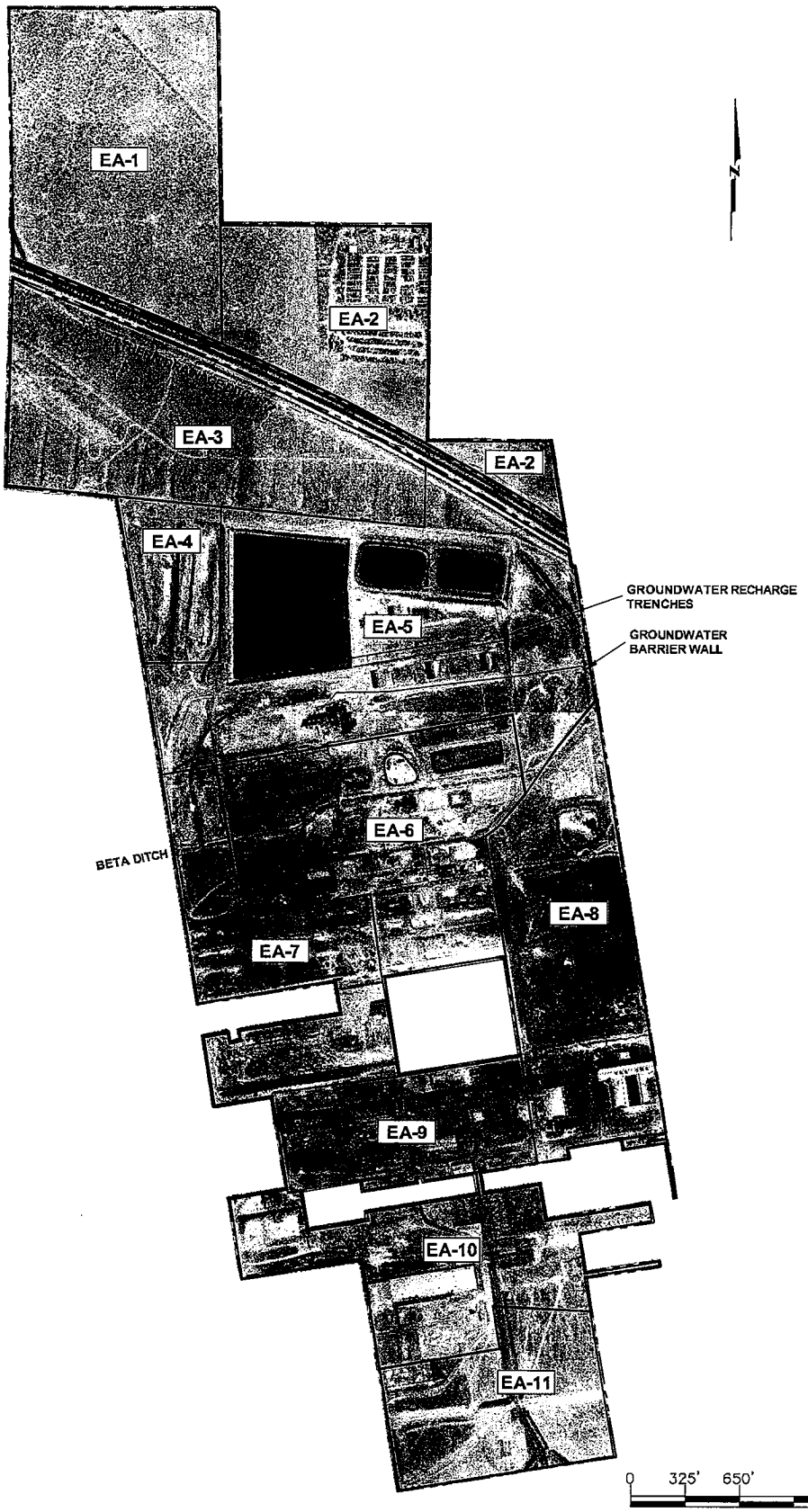
From: Bailey, Keith [Keith.Bailey@tronox.com]
Sent: Thursday, June 28, 2007 8:39 AM
To: Brian Rakvica; Shannon Harbour; TeriLCopeland@aol.com; Crowley, Susan; Gerry, Dave; Bradley, Lisa
Subject: FW: Revised EA Map....
Attachments: Figure 6-1 Evaluation Area Location Map.pdf

Brian, Shannon and Teri,

Attached is one more Figure that may be helpful for our discussion this morning.

Keith

FILENAME:



SHEET NUMBER:	FIGURE NUMBER:
X	6-1

PHASE B EVALUATION AREA LOCATION MAP

Source Area Investigation - Phase A
Tronox Facility
Henderson, Nevada

SCALE:	DATE:	PROJECT NUMBER:
1" = 650'	6/15/2007	04020-023-402

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DESIGNED BY:	REVISIONS			
L. Bradley	NO.:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
M. Scop				
CHECKED BY:				
B. Ho				
APPROVED BY:				
B. Ho				

Brian Rakvica

From: Brian Rakvica
Sent: Tuesday, July 03, 2007 11:55 AM
To: 'Bailey, Keith'; Shannon Harbour; Crowley, Susan; TeriLCopeland@aol.com; Gerry, Dave; Bradley, Lisa; Perry, Elizabeth; Kennedy, Robert
Cc: Paul Black
Subject: RE: Revised 070628_phase a b call.doc

Keith,

I think we need to discuss

NDEP noted that this does not address the need to identify the location and extent of the source areas.

i. TRX does not think this is necessary at this stage.
ii. NDEP noted that it is necessary to make remedial decisions and that leaching data is also necessary.
iii. TRX noted that additional sampling may occur in the future to address these issues, i.e., where a constituent is identified for a remedy, sampling can be done as part of the remedial action plan to identify the extent of the area to be addressed by the remedy.

Not understanding "nature and extent" means that remedy selection may fail.

The size of the problem will dictate the cost of the remedy. In some cases unit costs may decrease with size of the problem and other unit costs may increase linearly or exponentially.

It is also not clear how not understanding nature and extent would allow the Phased RI to be complete.

This should be a discussion point for our next call.

Thanks,

Brian

From: Bailey, Keith [mailto:Keith.Bailey@tronox.com]
Sent: Tuesday, July 03, 2007 11:50 AM
To: Brian Rakvica; Shannon Harbour; Crowley, Susan; TeriLCopeland@aol.com; Gerry, Dave; Bradley, Lisa; Perry, Elizabeth; Kennedy, Robert
Subject: Revised 070628_phase a b call.doc

Brian,

Attached are the revised minutes from our Phase A ECA call last week. We made a few small additions (see redline).

Our next conference call is scheduled for Friday July 6th at 9:30 am PDT (12:30 pm EDT). We will have revised schedule information to discuss on that call.

The call-in number for Friday is:
1-866-231-9615 Participant: 336732 Host: 147516
Have a great 4th of July holiday.

Keith

<<070628_phase a b call.doc>>

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

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 2, 2007

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to:
Quarterly Performance Report, Perchlorate Recovery System, Henderson, Nevada January – March 2007 dated May 29, 2007

Dear Ms. Crowley,

The NDEP has received and reviewed above-identified TRX report (1st Quarter 2007 Report). Comments have been provided in Attachment A. Please provide a fully annotated response to comments letter as an Appendix the Semi-Annual Performance Report for Chromium and Perchlorate for January – June, 2007.

Please contact the undersigned with any questions at 702-486-2850 x 240 or sharbour@ndep.nv.gov.

Sincerely,

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

CC: Jim Najima, NDEP, BCA, Carson City
Brian Rakvica, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Keith Bailey, Tronox, Inc, PO Box 268859, Oklahoma City, Oklahoma 73126-8859
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
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
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Mark Paris, Landwell, 875 West Warm Springs, Henderson, NV 89011
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, CO 80402
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, CA 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110
Paul Hackenberry, Hackenberry Associates, LLC, 550 W. Plumb Lane B425, Reno, Nevada 89509

Attachment A

1. General comment, please note that the March 29, 2007 NDEP Comments on the Semi-Annual Performance Report Dated February 26, 2007(2nd Semi-Annual 2006 Report) must be additionally applied to the Quarterly Performance Reports as applicable. This includes any similar tables and figures.
2. Section 1.0, last paragraph, include both the mass perchlorate removed per quarter and the mass perchlorate removed per day for the on-Site well field, Athens Road well field, seep area well field, and the grand total.
3. Section 2.0, first paragraph, last sentence, please explain the significance of comparing the current interceptor well field extraction rate to the 65 gpm rate that is cited.
4. Section 3.0, pg 3-2, second paragraph, the NDEP acknowledges that ARP-4, ARP-5, and ARP-6 have been temporarily abandoned for 6 to 9 months. Please continue to update the status of these piezometers in future Quarterly and Semi-Annual Performance Reports until these piezometers have been reestablished.
5. Tables, Table 2, please clarify the relationship between wells ART-6 and ART-9 via a footnote on this table.
6. Figures, the NDEP has the following comments:
    a. Figure 1, this Figure is not legible. It is not possible to discern the locations of many of the wells. Please provide this Figure on a larger sized piece of paper in the future.
    b. Figure 7, NDEP notes that based upon a review of this Figure it appears that no appreciable change in perchlorate concentration has occurred since 2001. This suggests a continuing source.
    c. Figure 8, see comment for Figure 7.
    d. Figure 14, due to the scale of this Figure it is not possible to discern any meaning. Please modify the scale in future submittals or provide two Figures with different time frames covered.
7. Appendix A, the depth to groundwater and groundwater elevations for the November 2006 sampling event reported in the 2nd Semi-Annual 2006 Report do not match several November 2006 values reported in the 1st Quarter 2007 Report. This was especially noted for the "ART" and "I" designated wells. Errata for Appendix A must be submitted with TRX's response to comments (RTC).
8. Appendix B, the NDEP has the following comments:
    a. Well M-48, it is noted that this well is downgradient of the slurry wall. Please explain what appears to be a continuing source of >200 mg/l perchlorate to this well.
    b. Well M-69, please explain the increasing concentrations in this well which is located on the western edge of the plume.
9. Appendix C, Database, Qualifiers, there are two columns of qualifiers in the database, "lab_qualifiers" and "validator_qualifiers." It is not always clear which of these was used to determine the final qualifier. It would seem that the validator_qualifier should be the final qualifier. Also, many "u" and "ud" lab_qualifiers do not have a qualifier in the validator_qualifier column. For completeness the report should clarify what the final qualifier is and how the lab_qualifiers are used.
10. Appendix C, Laboratory Reports, General Comment, a laboratory report is incomplete without a Case Narrative (or similar discussion of sample conditions and deviations from quality) and Chain of Custody (COC). Most of the laboratory reports submitted appears to have no Case Narrative - the Report Comments pages are blank (and unsigned), and the COC is missing for laboratory reports 198847.pdf, 198415.pdf, and possibly others. The DVSR should provide clarification as to why this information is missing. The DVSR is incomplete without all COCs.

11. Appendix D, RTC, general comment, this response to comments section should also be included in the 1st Semi-Annual 2007 Report.
12. Appendix D, RTC 7, according to Table 4 in the 1st Quarterly 2007 Report, Athens Rd well field exhibited a decrease of 106 pounds per day between June 2006 and July 2006 followed by an increase of 110 pounds per day between August 2006 and September 2006, which is when TRX reports that ART-9 became operational. Please discuss the cause(s) of the 106 pounds per day decrease and how this relates to the 110 pound per day increase two months later.
13. Appendix D, RTC 10.a, check the location of the vertical scale on Figure 2 of the 2nd Semi-Annual 2006 Report for accuracy. If the actual groundwater elevation of I-K is 1713.75, as reported by TRX, the vertical scale on Figure 2 shows that this elevation is still below the screened interval.
14. Appendix D, RTC 10.f.i-vii, the NDEP acknowledges that TRX collects samples from 50 sampling points on the interim groundwater treatment system and that illustrating these on the current Figure 7 would significantly decrease legibility of the figure. Therefore, please increase the size of Figure 7 and use footnotes to illustrate where the sampling points are located, what analyses are being conducted at each sampling point, and the frequency of sampling at each point. Please include these revisions in the 1st Semi-Annual 2007 Performance Report.
15. Appendix D, RTC 11.c, TRX's RTC does not address NDEP's original comment. Therefore, provide an explanation and discussion on the increasing total chromium outflow concentrations in the 1st Semi-Annual 2007 Performance Report. The discussion must include a schedule for how TRX plans to mitigate this issue.
16. Appendix D, RTC 11.e, please include and denote any estimated data in this table.
17. Appendix D, RTC 12.c, please include and denote any estimated data in Plate 3.
18. Appendix D, RTC 15.b.ii, please submit a schedule for and clarification on the intended procedures for the recommended pump test on M-71 and M-72. This item can be completed via an e-mail to the NDEP.
19. Appendix D, RTC 15.b.iii, the NDEP acknowledges that the current detection limit for total chromium is 0.02 mg/L. Please include a contour line for 0.02 mg/L on the Total Chromium in Groundwater map commencing with 1st Semi-Annual 2007 Report. If TRX believes that the 0.02 mg/l contour line is not plausible, please discuss this matter with the NDEP.
20. Appendix E, Section 1.0, Introduction, Sample and Analysis Clarification, the database provided with this DVSR includes all data from first quarter 2006 to first quarter 2007. This complicates review of the report and references provided in the report. For example, there are three different methods in the database for Chromium-Hexavalent, but only one of these methods appears to be relevant to this DVSR.
    a. In this section, provide a list of the analytes for which analyses were performed and the samples (e.g., 20 groundwater samples) that were analyzed included in this Performance Report.
    b. The report should include a table that shows the sample IDs (in rows) and the analytes (in columns) for which these samples were analyzed.
21. Appendix E, Section 1.0, Introduction, include a statement that all samples were filtered for all analyses, or if not all analyses, include for which analyses the samples were filtered.
22. Appendix E, Section 2.0, Data Validation Process, page 1, after the bullets, the DVSR refers to "the non-CLP methodologies." Please write out the acronym the first time it is used.
23. Appendix E, Section 2.0, the DVSR states, "The results contained in the lab reports listed in the data validation memorandum were subjected to thorough data review rather than formal full data validation as recommended in the guidance on data validation provided by NDEP for the BMI Plant Sites (NDEP, 2006). MWH did not provide complete data packages with raw data for the reviewed results and therefore, verification of the initial and continuing calibrations and other elements in the Tier 2 list beyond batch quality control (QC) were not available for review." The analytical laboratory, MWH,

should be required to provide data that allows validation to Tier 3 to meet the data validation guidance provided by NDEP.

24. Appendix E, Section 3.1, Holding Time and Sample Preservation and Table E-3, Table E-3 indicates a number of results were qualified due to holding time. However, both a J and a J- qualifier are used with no obvious distinction. This section should explain the logic for qualifying results as J- versus J.
25. Appendix E, Section 3.2, Blank Contamination, the memorandum included with this report, dated May 1, 2007 (file: TH1stqtr2007.pdf) indicates blank contamination was identified in two blanks. The DVSR should include a discussion of both blanks.
26. Appendix E, Section 4.1, Precision, paragraph 2, change "LSC/LCSD pairs" to "LCS/LCSD pairs."
27. Appendix E, Section 4.5, Comparability, this section should include the methods used for each analyte or suite of analytes, especially since multiple methods were included. It is noted that this information is in the memorandum dated May 1, 2007 (file: TH1stqtr2007.pdf) but should also be included in the DVSR. Also, two methods for total chromium are shown in the memorandum. The DVSR should explain why there were two methods used and discuss their comparability.
28. Appendix F, the NDEP does not find the information provided in this appendix useful without a corresponding map(s). The map(s) must include all wells listed on the proposed sampling plan and be color-coded with respect to sampling frequency with another map color-coded with respect to chemical analysis. Please submit these items in the 1st Semi-Annual 2007 Report.

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

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

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

June 26, 2007

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to:
Response to NDEP Comments of the Tronox Semi-Annual Performance Report dated February 28, 2007 and the Required Work Plan to Evaluate Effective Groundwater Capture at Tronox Extraction Systems, Henderson, Nevada dated May 30, 2007

Dear Ms. Crowley,

The NDEP has received and reviewed TRX's report/work plan identified above and has provided comments in Attachment A. It is requested that TRX resubmit this document with annotated response to comments **by July 31, 2007**. It is suggested that TRX discuss these issues with the NDEP prior to resubmittal.

If there are any questions, please do not hesitate to contact me.

Sincerely,

Shannon Harbour, P.E.
Staff Engineer
Bureau of Corrective Actions
Special Projects Branch
NDEP-Las Vegas Office

CC: Jim Najima, NDEP, BCA, Carson City
Brian Rakvica, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Keith Bailey, Tronox, Inc, PO Box 268859, Oklahoma City, Oklahoma 73126-8859
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
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
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Mark Paris, Landwell, 875 West Warm Springs, Henderson, NV 89011
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, CO 80402
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, CA 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110
Paul Hackenberry, Hackenberry Associates, LLC, 550 W. Plumb Lane B425, Reno, Nevada 89509

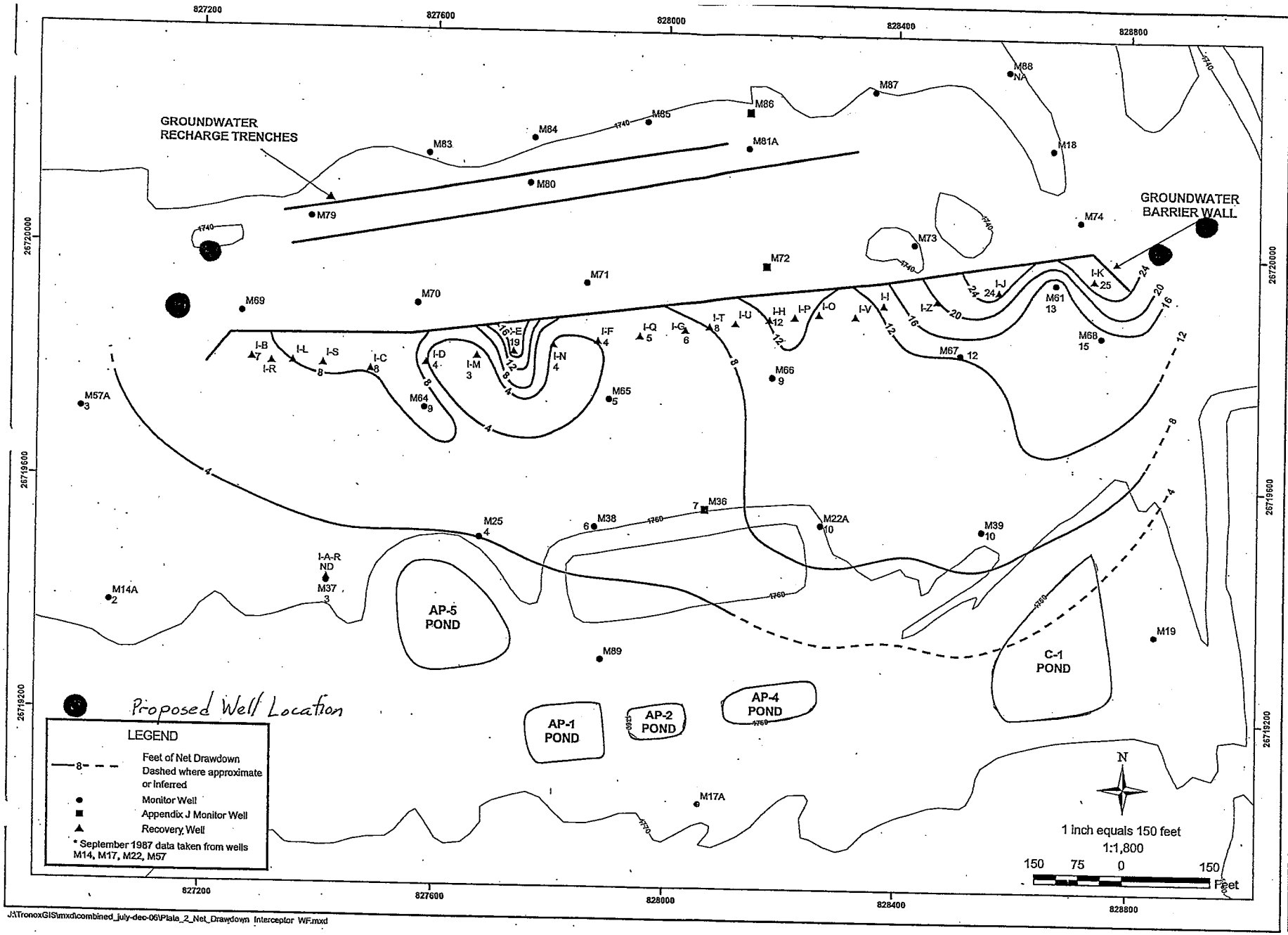
Attachment A

1. General comment, the subject work plan must be signed by a CEM per NAC 459.9719.
2. General comment, the Flow Budgets presented herein could be improved by calculating the estimated groundwater flow at one or more cross sectional areas and comparing these values to the volume of groundwater extracted at the respective well field.
3. General comment, TRX must discuss the relationship between perchlorate, hexavalent chromium and other Site-related chemicals. Some portions of the plume which contain high TDS water may migrate in a fashion that is atypical (due to density gradients or other reasons).
4. General Comment, TRX must include a map(s) illustrating the proposed locations of piezometers and groundwater monitoring wells.
5. Section I, page 1 of 7, footnote #1, the NDEP recommends adding the following reference: Capture Zone Analysis for Pump-and-Treat Systems, EPA NARPM Conference May 24, 2005.
6. Section I, page 2 of 7, 2nd paragraph, 2nd bullet, "Demonstration of overlapping cones of depression via flow nets both in plan view and vertical cross section." This is not included in EPA (2002) reference as a line of evidence. The EPA (2005) clearly indicates that drawdown (cone of depression) and capture zone are not the same. The capture zone and cone of depression will only be the same if background hydraulic gradient is zero. However, given the geometry of the line of extraction wells within and extending across a mapped paleochannel, the NDEP acknowledges that overlapping cones of depression can be a line of evidence. This comment is applied to a number of Sections of the report and will not be repeated.
7. Section II, page 2 of 7, Capture Zone, TRX indicates that the barrier wall was designed "to provide a physical barrier to groundwater migration across the width of the identified perchlorate plume." It is important to frame this discussion in terms of concentration because it is obvious that the lower concentration portions of the perchlorate plume are not being captured.
8. Section II, page 2 of 7, Flow Budget, TRX needs to support the argument about upward hydraulic gradient with on-site data including both water level elevation and water quality. In addition, TRX states "Current capture rates (70 gpm) are double those before the wall was installed." Please note that the rate of capture is irrelevant when the upgradient flow rate is unknown.
9. Section II, page 3 of 7, 1st paragraph 2nd sentence, Flow Budget, please provide the calculations and input parameters.
10. Section II, page 3 of 7, 2nd and 3rd paragraphs, last sentences, Flow Budget, the NDEP has the following comments:
    a. The NDEP requests that this statement be supported with the installation of at least two monitoring wells at both locations as illustrated in Figure 1 (see following comment) to measure gradient. Flow may then be calculated using these newly installed monitoring wells and M69 (west side) and M74 (east side).
    b. Please note that the NDEP is including Figure 1 as example of possible well locations for comment clarity. TRX may propose different well locations.
    c. TRX should include a map illustrating the proposed locations of the monitoring wells. This comment applies to other portions of the work plan as well.
    d. TRX states "the volume of groundwater migrating around the…end of the barrier wall is estimated to be less than 1 gpm." It is not evident how this number was derived and what concentration applies to the 1 gpm number. Based on the data provided by TRX and others, the NDEP believes that a >1 mg/l plume impacts the northern 50% of the TIMET property. The source of this plume appears to be TRX.

11. Section II, page 3 of 7, 4th paragraph, Flow Budget, TRX must provide basis for this evaluation, i.e., calculations and input parameters.
12. Section II, page 3 of 7, Downgradient Concentration Declines over Time, water from Lake Mead is likely 0.010 mg/L or less based on historical analysis. Thus, the expansion of a zone containing less than 100 mg/L could occur through dilution alone by the addition of low perchlorate concentration water regardless whether the extraction wells were achieving capture at the rate in which TRX describes.
13. Section II, page 3 of 7, Downgradient Concentration Declines over Time, please delete the last two sentences from this paragraph because the addition of low perchlorate concentration water invalidates the analysis.
14. Section II, page 4 of 7, Proposed Additional Evaluation, 1st bullet, as noted above, the NDEP is not sure what this will prove because low perchlorate concentration water from Lake Mead is being injected downgradient of these wells.
15. Section II, page 4 of 7, Proposed Additional Evaluation, 3rd bullet, the NDEP requests three shallow (water table) monitoring wells at each end of the barrier wall to evaluate effectiveness of the barrier. (See also comment above.)
16. Section II, page 4 of 7, Proposed Additional Evaluation, 5th bullet, the NDEP requires contouring water level elevation excluding the use of pumping water levels from extraction wells. TRX may propose a method to estimate water levels for pumping wells taking into account well losses (inefficiency). Alternately, TRX could install piezometers in this area.
17. Section II, page 4 of 7, Proposed Additional Evaluation, the NDEP suggests that TRX consider installation of monitoring wells in a north south line along the TIMET-TRX border to delineate the extent of the plume in this area. Alternately, TRX could utilize some existing TIMET wells if they are adequate. Based upon the recently completed TIMET CSM the concentrations of perchlorate at TIMET range from 0.069 mg/l (along Lake Mead Parkway) to a high of 4.3 mg/l on the western side of the TIMET property (well CLD1-R).
18. Section II, page 4 of 7, Performance Evaluation, TRX should examine the concentration versus time trend graphs for the Athens Road well field. The NDEP notes that no appreciable change can be discerned from September 2001 to the most current quarterly report. The NDEP acknowledges that some of the declines may be obscured by the scale of the Figure. In any case, TRX should discuss these trends specifically and present Figures which are legible and appropriately scaled. In addition, TRX should discuss these concentrations versus time trend graphs in relation to the estimated travel times of the remedial system. For example, discuss the concentrations in the Athens Road well field from the time of the installation of the slurry wall until the present time and then explain why the concentrations are not declining. It appears to the NDEP that some portion of the 100 mg/l perchlorate plume is not being captured on-Site.
19. Section II, page 5 of 7, Athens Road Extraction Gallery, Flow Budget, the NDEP requires TRX to provide the calculations and input parameters before the NDEP will comment on the results of the calculations.
20. Section II, page 5 of 7, Athens Road Extraction Gallery, Overlapping Cones of Depression, see comment above regarding overlapping cones of depression. The 11 foot drawdown reported for ART-3 in the *Semi-Annual Performance Report for Chromium and Perchlorate* dated February 6, 2007 may be the result of well inefficiency.
21. Section II, page 5 of 7, Athens Road Extraction Gallery, Inward Flow, the NDEP does not agree that inward flow is demonstrated by the Potentiometric Surface Map, Fourth Quarter 2006. West of the TMCf high the groundwater elevation contours and data as posted on the map show a gradient south to north, *i.e.*, towards the wash. East of the TMCf high there is insufficient data to support the closed (depression)

contour as drawn on the map. No groundwater elevation data have been reported between the closed 1590 contour and the 1590 contour to the north to indicate a higher water level. An alternative way to map this data could include connecting the 1590 depression contour with the same 1590 contour to the north.

22. Section II, page 5 of 7, Athens Road Extraction Gallery, Proposed Additional Evaluation, 2nd bullet, unless the "available and accessible monitor wells along the width of Athens Road" lie between the ART-series and ARP-series wells there may still not be adequate groundwater level data to demonstrate inward flow. It may be necessary to install one or more well pairs to the ART "buddy" wells to achieve this purpose. If well pairs are installed NDEP should review and approve the location for these wells.
23. Section II, page 5 of 7, Numerical Modeling, this discussion has no references and hence cannot be verified by the NDEP. In addition, the NDEP noted that the numerical modeling completed previously (but not referenced in this report) does not demonstrate the 97.5% capture purported by TRX.
24. Section II, page 6 of 7, Seep Area Collection System, Flow Budget, no flow budget is presented or referenced in this section. The NDEP requires a flow budget calculation to be presented or referenced.
25. Section II, page 6 of 7, Seep Area Collection System, Overlapping Cones of Depression, see comment above. In addition, the NDEP does not believe that overlapping cones of depression have been demonstrated to exist in this area.
26. Section II, page 6 of 7, Seep Area Collection System, it is not clear to the NDEP that full capture in the Seep Area is warranted or feasible. The goals for this area should be discussed and a capture zone should be agreed upon. It is evident that the remedial system can be optimized in this well field and others.



REVISIONS:			
NO:	DESCRIPTION:	DATE:	BY:

DESIGNED BY:	E. Krish
DRAWN BY:	T. McAdam
CHECKED BY:	E. Krish
APPROVED BY:	D. Gerry

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NET DRAWDOWN AT THE INTERCEPTOR WELL FIELD
SEPTEMBER 1987 TO NOVEMBER 2006
Semi-Annual Performance Report
Tronox Facility
Henderson, Nevada

DATE:	PROJECT NUMBER:
January 2007	04020-023-110

SCALE: NTS

PLATE NUMBER: 2

SHEET NUMBER: 1

Figure 1

Brian Rakvica

From: Brian Rakvica
Sent: Friday, June 22, 2007 2:52 PM
To: Bailey, Keith; Crowley, Susan; Gerry, Dave; Shannon Harbour
Cc: 'David Gratson'; Brian Rakvica
Subject: TRX Phase A DVSR

All,

NDEP's comments on the DVSR are provided below:

General comment, the ENSR data validators were quite thorough so the NDEP generally agreed with their qualifiers and validation.

General comment, having the tables in Excel was also convenient.

1. Section 3.2, page 8. The DVSR states, "The nondetect results for tert-butyl alcohol in 204 samples were qualified as estimated (UJ) because the minimum RRF requirement of 0.05 was not met in the associated ICALs." This may indicate that the sensitivity for this analyte is not being met and the reporting limit should be raised. This issue should be investigated with the laboratory.

2. Section 3.3, page 10. The DVSR states, "Potential positive isobaric interferences were associated with detections for a total of 148 samples and these results were qualified as estimated with a possible high bias (J+) in the absence of other reasons for qualification. The qualified metals include manganese (52 samples), nickel (42 samples), strontium (45 samples), and zinc (3 samples)." Review of Table E-7 shows that many of these results have been qualified with a J (no positive sign). Please clarify this text or correct the Tables and database.

3. Section 3.5, pages 11-12. A large number of sample results were censored ("negated") as a result of blank contamination. The effect of censoring these results seems acceptable with a few exceptions. There are several analytes in which the resulting reporting limit, after censoring, is above or near important risk or apparent background values. Some of these sample and analyte combinations are provided below.

Sample ID	SDG	Analyte	Result	Units	Qualifiers
SA25-15	ENSR110306	Cadmium	0.068	mg/kg	U
EB110706	ENSR110306	Copper	1.6	ug/l	U
M55	ENSR120506	Copper	6	ug/l	U
M55D	ENSR120506	Copper	6	ug/l	U
SA25-15	ENSR110306	Copper	8.9	mg/kg	UJ
M11	ENSR120506	Manganese	93.5	ug/l	UJ
M11D	ENSR120506	Manganese	96.0	ug/l	UJ
M39	ENSR120506	Manganese	208	ug/l	UJ
M48	ENSR120506	Manganese	20.9	ug/l	UJ
M55	ENSR120506	Manganese	37.4	ug/l	UJ
M55D	ENSR120506	Manganese	54.6	ug/l	UJ

M95	ENSR120506	Manganese	68.9	ug/l	UJ
M12A	ENSR120506	Thallium	7.8	ug/l	U

These results, at a minimum, should be examined in depth to determine whether there is sufficient blank influence to justify censoring when they may be important data for any future decisions. All mercury and nitrate (in soil) values should also be carefully reviewed for similar issues.

A number of blank values in Table E-9 are negative (e.g. selenium). It is unclear why the associated sample would need to be censored when the blanks have negative values. These results should be reviewed and a justification provided for censoring when the blanks are negative.

4. Total TEQ Values, Form 3 versus Database. There appears to be slight differences in the Total TEQ values. The values reported by CAS-Houston, on Form 3, are different from those in the database provided. For example, in the file e report E0600829.pdf, page 4 of 6, the Total TEQ for sample SA5-0.5 is 17.1. The value in the database is 15.09. Similar differences are noted for other Total TEQ values. Please review these data and provide an explanation for these differences or correct the database.

5. Filtered versus unfiltered database. Included in the DVSR package was an Access database that contained both filtered and unfiltered results. These two databases were compared and it was noted that the filtered database contained only 31 results for perchlorate, compared to 137 for the unfiltered with the following conditions for the unfiltered database: detect = Y, Result Type = TRG, Sample Type = N). Some of the differences between the filtered and unfiltered database appear to be due to removal of samples where results were taken at multiple depths. For example, the filtered database contains only two perchlorate records for sample SA02: SA2-0.5 and SA2-60. Yet the unfiltered database contains detected results at six different depths. Also, no results for sample SA10 were found in the filtered database. These results are not consistent with the Tronox filtering rules, please review the databases and provided clarification or corrections.

These comments should be addressed in the finalized DVSR. A response to comments before that time or with the finalized DVSR is also requested.

Thanks,

Brian

Brian A. Rakvica, P.E.
Supervisor, Special Projects Branch
Bureau of Corrective Actions
Nevada Division of Environmental Protection
tel: 702-486-2850 x 247
e: brakvica@ndep.nv.gov
fax: 702-486-2863

Brian Rakvica

From: Brian Rakvica
Sent: Thursday, June 07, 2007 8:34 AM
To: Bailey, Keith; 'susan.crowley@tronox.com'; 'Gerry, Dave'
Cc: Maria Skorska; Shannon Harbour; Todd Croft; 'BILL FREY'; Jim Najima; Brian Rakvica
Subject: Montrose Access Request to Tronox
Importance: High

Keith,

As I noted to you yesterday, The Nevada Division of Environmental Protection (NDEP) has requested that Montrose Chemical Corporation of California (Montrose) proceeds with additional non-aqueous phase liquid (NAPL) reconnaissance activities. Based on data collected to date, it is evident that these activities are required to continue on to the Tronox property to delineate the extent of areas impacted by NAPLs. The NDEP understands that this work is to be performed by Hargis & Associates as a continuation of the work described in the February 16, 2007 Technical Memorandum " Plan for Additional DNAPL Reconnaissance Borings as part of the Montrose Supplemental Groundwater Investigation Workplan" and subsequent documentation provided to the NDEP by Montrose (in the form of e-mails). The work plan for these activities is "dynamic" consistent with established guidance (e.g.: the USEPA's TRIAD approach).

Furthermore, as noted under separate cover, this access is required via the 1996 Phase II Consent Agreement, Section X, Paragraph 5.

Please advise if this e-mail provides the necessary information for Tronox to proceed with an access agreement for Montrose.

If there are additional questions, do not hesitate to contact me. This work is a very high priority for the NDEP.

Thank you for your consideration in this matter.

Brian

Brian A. Rakvica, P.E.
Supervisor, Special Projects Branch
Bureau of Corrective Actions
Nevada Division of Environmental Protection
tel: 702-486-2850 x 247
e: brakvica@ndep.nv.gov
fax: 702-486-2863

Meeting Minutes

Project:	Tronox (Trx)
Location:	Tronox Henderson Facility
Time and Date:	11:00 AM, Wednesday, June 06, 2007
In Attendance:	NDEP-BCA – Brian Rakvica, Shannon Harbour
	Tronox – Keith Bailey
	ENSR – Dave Gerry, Carmen Schnell
	Neptune – Paul Black (for NDEP)
	Hackenberry Assoc. – Paul Hackenberry (for NDEP)

CC: Jim Najima

1. The meeting was held to discuss a variety of topics including the Phase A Report and Phase B Work Plan.
2. Phase A data validation: TRX has sent a copy on CD of the data validation summary reports to David Gratson and NDEP for preliminary review. The lab sheets on CD were sent to David Gratson separately. NDEP indicated that review should be completed within a couple of weeks. TRX requested that any comments be sent via e-mail.
3. Asbestos data revision completed.
    a. TRX indicated that 5 evaluation areas contain asbestos at levels requiring additional investigation.
    b. Lisa Bradley will summarize data in a report, which will include risk calculations and analytical data. This report will be available in time for inclusion in the Phase A Report.
4. Phase A Report:
    a. Table 3-2 was submitted to the NDEP for preliminary review. NDEP responded with comments via e-mail. TRX has reviewed and corrected Table 3-2 accordingly.
    b. Background/Upgradient data has been used in the development of histograms. There seems to be fair overlap in comparison to the BRC and COH datasets. TRX will provide this analysis as a separate chapter to be added to the Upgradient report. This chapter will likely refute the original conclusions, which were purely based on statistics. The RTC for the Upgradient report may be completed after the submittal of the Phase A Report / Phase B Work Plan.
    c. Chloroform map: TRX drafted maps illustrating both the groundwater concentrations and the iso-contours but feel that the maps are to busy and will prepare separate maps for inclusion in the Phase A Report.
    d. Leaching pathway: TRX is conducting an evaluation of analytes detected in the soil to determine their potential to threaten underlying groundwater. It is the expectation of the NDEP that leaching pathway calculations will be presented for any contaminant that is not being proposed by TRX for additional characterization.
    e. Evaluation areas: TRX wants to sell certain parcels to raise money and pay off debt. TRX will propose evaluation areas that match these parcels were

relevant. That way a risk assessment may be prepared for the area that coincides with the parcel being requested for NFA.

f. Database Coordinates: TRX stated that the X-Y coordinates are already on TRX's database and that they will be provided to the NDEP. **ACTION ITEM.**

g. Phase A Addendum (low-flow, filtered vs. unfiltered samples): TRX stated that the additional sampling will not be validated in time for inclusion in the Phase A Report. The validated data will be included in the Phase B Report but unvalidated data may also be used to make decisions about the quality of the data collected during the Phase A investigation. NDEP agreed.

5. Phase II Work Plans: TRX would like to see several parcels receive NFAs by the end of this calendar year. TRX also wants to coordinate ECA work plans with BRC Phase II work plans to make sure that characterization is not duplicated by BRC and vice versa.
6. Schedule update:
    a. Phase A report / Phase B Work Plan: End of July 2007
    b. Phase B approval: September 2007
    c. Phase B sampling: October 2007
    d. Phase B Report: February 2008
    e. Risk Assessment: June 2008
    f. Next Call: 11:00 AM July 13, 2007

Shannon Harbour

From: Bradley, Lisa [lbradley@ensr.aecom.com]
Sent: Thursday, May 31, 2007 2:56 PM
To: Shannon Harbour
Cc: Bailey, Keith; Crowley, Susan; Gerry, Dave; Bilodeau, Sally; Sauer, Katherine; Vosnakis, Kelly
Subject: FW: Phase A Report: Draft Table 3-2 Review by NDEP

Shannon -

Thanks so much for taking the time to first, review the table in detail, and second, to go over your comments with me! I have indicated below the resolution to each - hopefully this captures your understanding as well. Let me know if you have any comments on my summary!

:) LIAS

Lisa JN Bradley, Ph.D., DABT
Senior Toxicologist
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866-758-4856 (fax)
lbradley@ensr.aecom.com
www.ensr.aecom.com
978-589-3000

From: Shannon Harbour [mailto:sharbour@ndep.nv.gov]
Sent: Wednesday, May 30, 2007 5:55 PM
To: Bailey, Keith; Crowley, Susan
Cc: Brian Rakvica; Gerry, Dave; Bradley, Lisa
Subject: RE: Phase A Report: Draft Table 3-2 Review by NDEP

Keith and Susan,

NDEP has reviewed the Draft Table 3-2 for the upcoming Phase A Report. It appears that there a number of errors in the draft Table 3-2 that was provided to the NDEP. The following reflect our comments:

Please verify the following numbers as they appear to be in error:

1. Hexavalent chromium, USEPA MCL – this needs a note to explain what this number signifies.
   Tronox will not use the total chromium MCL for hexavalent chromium, but instead will use a comparison value based on the tap water PRG.
2. Total chromium, Ind Soil PRG – This value is listed as 4.48E+02. Add rationale if not using this number.
   Tronox will use the value as indicated above.
3. Copper – Nevada MCL
   Tronox will use the Federal TTAL as the comparison value, but will include the Nevada Secondary MCL

on the table.

4. 1,2-Dibromoethane, Bromodichloromethane, Bromoform, Dibromochloromethane – no USEPA MCL

   1,2-Dibromoethane is synonymous with Ethylene dibromide. For this chemical and others mentioned in the email, Tronox will add appropriate synonyms in the analyte column of the table.

   The remaining three chemicals do have USEPA MCLs (the source document was sent to you in an earlier email). These will be footnoted that they apply to total trihalomethanes.

5. 1,2,3-Trichloropropane: note that the cancer endpoint PRG is listed in table.

   Tronox will add this to the table footnotes.

6. Uranium 235 and Uranium 238 – footnote indicates that for radionuclides with decay chains, the PRG for the decay chain was used. Check against PRG with decay chain for typos.

   Tronox will correct the error.

7. Chloroform – should note that the MCL is for total trihalomethanes

   Tronox will note this in a footnote.

8. The following PRG values should be checked against the PRG table for typos: Aldrin, Aroclor 1221, Aroclor 1232, Aroclor 1242, Aroclor 1248, Aroclor 1254, Aroclor 1260, ETBE, and MTBE,

   Aldrin - is correct in Table 3-2

   The tap water PRG values for the aroclors had been rounded in Table 3-2, Tronox will update these to be the same value as in the PRG table.

   As we discovered together on-line, the 2004 PRGs have been updated - at least with respect to MTBE. The updated tap water PRG of 11 ug/L will be listed in the table for both MTBE and ETBE.

9. The following values could not be located in the PRG table: Coumaphos, EPN, Parathion-ethyl, Sulfotepp, Silvex, 4-Chlorotoluene, and Dibromomethane.

   Coumaphos - the PRG value will be listed as NA - Tronox does not have an appropriate surrogate.

   EPN - is listed on the PRG table as Ethyl p-nitrophenyl phenylphosphorothioate - Tronox will note this as a synonym.

   Parathion-ethyl - the value in table 3-2 was based on parathion - upon review, the value for parathion-methyl will be used as the surrogate, and footnoted to that effect.

   Sulfotepp - is on the PRG table as Tetraethyldithiopyrophosphate - Tronox will note this as a synonym.

   Silvex - is on the PRG table as 2-(2,4,5-Trichlorophenoxy)propionic acid - Tronox will note this as a synonym.

   4-Chlorotoluene - Tronox used 2-chlorotoluene as a surrogate, this will be noted in a footnote.

   Dibromomethane - Tronox used methylene bromide as a surrogate, this will be noted in a footnote.

10. Xylenes – add (mm) footnote to Industrial Soil PRG and Selected Comparison Level: Industrial Soil PRG columns.

    We discussed that your comment was really for p-isopropyltoluene - Tronox will add the (mm) footnote for this constituent as well.

In addition, please make the following changes:

1. As discussed, please add a column that explains the basis for the selected number. The numerous footnotes are cumbersome and do not appear to be used for each number that is presented as the selected comparison value.

   The final report table will include this column.

2. Add rationale for substitution of a surrogate analyte (e.g. Methyl isobutyl ketone was used as a surrogate for 2-Hexanone due to structural similarity).

   Surrogate selection footnotes will identify where appropriate that the surrogate was selected based on structural similarity.

3. Nevada has an action level for TPH in soils of 100 mg/kg.

   The reference was provided by email, and Tronox will incorporate into the table.

4. Please be advised that Nevada has guidance regarding MTBE that can be provided, if necessary.

Please advise.

The reference was provided by email, and Tronox will incorporate into the table.

5. Parathion-methyl is listed as Methyl parathion in the PRG table. Please note.
   Tronox will identify synonyms in the analyte column of the table.
6. Isopropyl benzene is listed as Cumene (isopropylbenzene) in the PRG table. Please note.
   Tronox will identify synonyms in the analyte column of the table.
7. Silvex is listed as 2-(2,4,5-Trichlorophenoxy) propionic acid in the PRG table. Please note.
   Tronox will identify synonyms in the analyte column of the table.
8. Footnote (s): remove "NDEP." and "to NAC.445A.201" from the reference. Add "Las Vegas Wash" to the reference.
   Tronox will make these edits.

Sincerely,
Shannon

Shannon Harbour, P.E.
Bureau of Corrective Actions
NDEP-Las Vegas Office
2030 E Flamingo Rd Suite 230
Las Vegas, NV 89119
702-486-2850 x 240 (work)
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Shannon Harbour

From: Shannon Harbour
Sent: Wednesday, May 30, 2007 2:55 PM
To: 'Bailey, Keith'; 'Crowley, Susan'
Cc: Brian Rakvica; 'David Gerry'; 'Lisa Bradley'
Subject: RE: Phase A Report: Draft Table 3-2 Review by NDEP

Keith and Susan,

NDEP has reviewed the Draft Table 3-2 for the upcoming Phase A Report. It appears that there a number of errors in the draft Table 3-2 that was provided to the NDEP. The following reflect our comments:

Please verify the following numbers as they appear to be in error:

1. Hexavalent chromium, USEPA MCL – this needs a note to explain what this number signifies.
2. Total chromium, Ind Soil PRG – This value is listed as 4.48E+02. Add rationale if not using this number.
3. Copper – Nevada MCL
4. 1,2-Dibromoethane, Bromodichloromethane, Bromoform, Dibromochloromethane – no USEPA MCL
5. 1,2,3-Trichloropropane: note that the cancer endpoint PRG is listed in table.
6. Uranium 235 and Uranium 238 – footnote indicates that for radionuclides with decay chains, the PRG for the decay chain was used. Check against PRG with decay chain for typos.
7. Chloroform – should note that the MCL is for total trihalomethanes
8. The following PRG values should be checked against the PRG table for typos: Aldrin, Aroclor 1221, Aroclor 1232, Aroclor 1242, Aroclor 1248, Aroclor 1254, Aroclor 1260, ETBE, and MTBE,
9. The following values could not be located in the PRG table: Coumaphos, EPN, Parathion-ethyl, Sulfotepp, Silvex, 4-Chlorotoluene, and Dibromomethane.
10. Xylenes – add (mm) footnote to Industrial Soil PRG and Selected Comparison Level: Industrial Soil PRG columns.

In addition, please make the following changes:

1. As discussed, please add a column that explains the basis for the selected number. The numerous footnotes are cumbersome and do not appear to be used for each number that is presented as the selected comparison value.
2. Add rationale for substitution of a surrogate analyte (e.g. Methyl isobutyl ketone was used as a surrogate for 2-Hexanone due to structural similarity).
3. Nevada has an action level for TPH in soils of 100 mg/kg.
4. Please be advised that Nevada has guidance regarding MTBE that can be provided, if necessary. Please advise.
5. Parathion-methyl is listed as Methyl parathion in the PRG table. Please note.
6. Isopropyl benzene is listed as Cumene (isopropylbenzene) in the PRG table. Please note.
7. Silvex is listed as 2-(2,4,5-Trichlorophenoxy) propionic acid in the PRG table. Please note.
8. Footnote (s): remove "NDEP." and "to NAC.445A.201" from the reference. Add "Las Vegas Wash" to the reference.

Sincerely,
Shannon

Shannon Harbour, P.E.
Bureau of Corrective Actions
NDEP-Las Vegas Office
2030 E Flamingo Rd Suite 230
Las Vegas, NV 89119
702-486-2850 x 240 (work)
702-486-2863 (fax)

Brian Rakvica

From: Bailey, Keith [Keith.Bailey@tronox.com]
Sent: Wednesday, May 30, 2007 2:53 PM
To: Brian Rakvica; Shannon Harbour; David Gratson
Cc: Crowley, Susan; Gerry, Dave
Subject: FW: DVSR Text, Revised Validated Results Tables and Final DV Memos
Attachments: Revised Validate Results Tables 053007.zip; DVSR.zip; Final DV Memos.zip

Brian,

As we discussed on the phone this afternoon, I am forwarding a Preliminary Submission associated with the Phase A Environmental Conditions Assessment (ECA) for the Tronox Henderson, NV site. Attached are three zip files containing the Data Validation Summary Report, final Data Validation memos, and revised tables of validated results for the Phase A work. Tronox appreciates your willingness to review these documents in advance of our formal Phase A report submission.

If you have questions or comments, please give me a call at (405) 775-6526. Susan Crowley is recovering at home from back surgery and will not be available for a week or two.

Keith

From: Gerry, Dave [mailto:DGerry@ensr.aecom.com]
Sent: Wednesday, May 30, 2007 4:28 PM
To: Bailey, Keith; Crowley, Susan
Cc: Bilodeau, Sally; Caceres-Schnell, Carmen; Gerry, Dave
Subject: DVSR Text, Revised Validated Results Tables and Final DV Memos

Keith,

Attached are the DVSR components. Westford moved much of earth (not sure about heaven) to get this done. The parts I checked looked good.

Please give me a call if you have questions.

David L. Gerry
ISC Department Manager
ENSR
1220 Avenida Acaso
Camarillo, CA 93012-8738
T: 805.388.3775 F: 805.388.3577
e-mail: dgerry@ensr.aecom.com

Brian Rakvica

From: Brian Rakvica
Sent: Friday, May 18, 2007 2:15 PM
To: 'Crowley, Susan'; 'Bailey, Keith'; Shannon Harbour
Cc: Brian Rakvica
Subject: TRX submittal dates

Keith

As we discussed, the revised submittal date of 5/30/07 for the Phase A DVSR; Semi-Annual Report RTC and the Capture Zone work plan is acceptable to the NDEP.

Thanks,

Brian

Brian A. Rakvica, P.E.
Supervisor, Special Projects Branch
Bureau of Corrective Actions
Nevada Division of Environmental Protection
tel: 702-486-2850 x 247
e: brakvica@ndep.nv.gov

Meeting Minutes

Project:	Tronox (TRX)
Location:	Conference Call
Time and Date:	9:00 AM, May 14, 2007
In Attendance:	NDEP-BCA – Brian Rakvica, Shannon Harbour, Todd Croft Tronox – Keith Bailey, Susan Crowley

CC: Jim Najima

1. This conference call was held to discuss a variety of issues including NDEP's March 29, 2007 comment letter Re: *Semi-Annual Performance Report for Chromium and Perchlorate.*
2. Semi-Annual Report comment letter:
    a. TRX requested clarification on whether the NDEP was expecting the Semi-Annual report to be revised and resubmitted. NDEP stated that the only deliverables requested in the March 29th letter are the groundwater capture report and a response to comments document.
    b. TRX will submit a response to comments document and incorporate the NDEP's comments into future reports.
3. Nevada MCLs:
    a. TRX receiving guidance from two branches of NDEP. BCA was not aware of the Nevada contaminant standards prior to the submittal of Draft Table 3-2.
    b. NDEP stated that Federal secondary standards typically don't require compliance. NDEP noted that the primary and secondary requirements could be located within the NAC and the requirements should be reviewed by TRX.
    c. Brian Rakvica sent an e-mail to TRX stating that the NDEP would not conduct a full review of Table 3-2 until the Phase A report is submitted. NDEP had provided a number of examples of issues with Table 3-2 in the aforementioned email. The NDEP does not intend to conduct a line-by-line review for quality control of the table's contents. TRX requested that they be informed of any errors that NDEP has observed on any of the draft submittals.
    d. TRX will reissue Table 3-2 revised to address NDEP's comments to date.
    e. TDS:
        i. TRX is concerned about the requirement to remediate groundwater to drinking water standards when no exposure pathways exist for this groundwater.
        ii. NDEP stated that the groundwater would have to be specifically exempted from the non-degradation policy by the administrator of NDEP. Without this exemption it is not clear how TRX could avoid compliance.

iii. Background TDS concentrations were discussed and NDEP stated that the southern edge of the BMI complex along Lake Mead exhibits concentrations in the as low as 700 mg/L, which is less than the 1,900 mg/L Beneficial Use Standard for Las Vegas Wash. NDEP additionally stated that TRX should be thinking how they are going to handle their TDS for their permits, especially NPDES renewal because of SCOP project removing significant flow from Las Vegas Wash. TRX stated that Jim Hogan (NDEP-BWPC) will be conducting 2-year review of current NPDES permit in November 2007. TRX has already begun investigating mass balance for Las Vegas Wash and Colorado River System.

iv. NDEP briefly explained AMPAC's UIC permit restrictions on TDS and other constituents.

f. TRX requested information on how the other BMI companies have handled the TDS issue. NDEP stated that PSSM is looking at reinjection of their treated effluent into the highly contaminated portion of their plume. PSSM is additionally looking at revising the Parson's report on the costs vs. benefits associated with the treatment of TDS.

4. TRX has received NDEP's comments on the Phase I report. Ron Sahu of BRC will be responding.

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

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

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

May 11, 2007

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to:
Phase I Environmental Site Assessment – Approximately 182 Acres of land
dated March 5, 2007

Dear Ms. Crowley,

The NDEP has received and reviewed TRX's report identified above and provides comments in Attachment A. It is requested that TRX provide an annotated response-to-comments (RTC) letter prior to resubmitting this document or a Phase II work plan. It is suggested that TRX discuss these issues with the NDEP prior to resubmittal.

If there are any questions please do not hesitate to contact me.

Sincerely,

Brian A. Rakvica, P.E.
Supervisor
Bureau of Corrective Actions
Special Projects Branch
NDEP-Las Vegas Office

CC: Jim Najima, NDEP, BCA, Carson City
Shannon Harbour, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Mike Richardson, NDEP, BWM, Las Vegas
Keith Bailey, Tronox, Inc, PO Box 268859, Oklahoma City, Oklahoma 73126-8859
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
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
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Mark Paris, Landwell, 875 West Warm Springs, Henderson, NV 89011
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, CO 80402
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110

Attachment A

1. General comment, the Figures do not always show the entire parcel. If only a portion of the parcel is being considered for the Phase I, then the entire parcel should be shown with the area of interest demarked. For example, Figure 3 shows only portions of APN 178-12-401-009 and 178-13-101-002.
2. General comment, during a site visit with TRX's contractor (Basic Remediation Company) it was noted that the development plans do not necessarily coincide with the Parcel definitions. It is suggested that the revised report be broken into smaller reports. For example, the report could address these areas to coincide with development plans or on a parcel-specific basis. This issue should be discussed with the NDEP.
3. General comment, the Figures do not label the surrounding Site features and the text does not provide a sufficient description of the surrounding Site features. For the NDEP to fully understand the potential impacts to the various parcels the NDEP would need to review the TRX Conceptual Site Model (CSM) as well as data from surrounding BMI Companies (e.g.: TIMET, Pioneer, Stauffer, and Montrose) and WAPA. The NDEP will not complete this exercise for TRX; please be aware that the comments below are therefore *not comprehensive*. Additional details are provided below:
    a. None of the Figures show the relationship of these Parcels to surrounding source areas. TRX has identified most of these source areas in their CSM: however, transparency is lacking in this document.
    b. The Figures and the text do not discuss the historic disposal ditches relative to the Parcels that are presented. It is the understanding of the NDEP that some of these Parcels may have been impacted by historic disposal ditch operations. This issue must be discussed.
    c. The report does not appear to address the former usage of the Southern portion of the TRX facility by State Industries, please discuss how this relates to the parcels included in this report.
    d. In addition, the report does not appears to address how the former U.S. Vanadium operations may have affected any of the parcels. Please discuss.
    e. Additional comments and examples are provided below.
4. General comment, the report in general is very repetitive. The same information is presented a number of times for each Parcel. This is perhaps unnecessary and is not helpful. The report should focus on providing additional detail rather than repeating the same information. NDEP understands that this format may be necessary to address the "All Appropriate Inquiries" requirements; however, some modifications are suggested below.
    a. For example, Section 8.0, Findings states "A cursory summary of findings is provided below. However, details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein." TRX does not provide cross-references to the appropriate Sections of the report for

the NDEP or reviewer. This makes the review of this document very onerous. It is suggested that the "Findings" be comprehensively summarized in this Section for ease of review/transparency.

b. Some of the NDEP's comments listed below may be addressed in the report; however, it is very difficult to locate the information in the report. NDEP regrets any comments that are presented below that are unnecessary.

5. Section 4.4.3, page 47, Converse lists reports that were made available to review to complete this Phase I report. The list of reports is very limited and that provides one explanation as to why the report may be so deficient.
6. Section 9.0, page 69, the report discusses various debris piles. Please note that it is evident that some of these piles may have been burned. Please discuss this in terms of any dioxin/furan impacts to the Site.
7. Section 9.0, page 70, item 4, provide references for the "Review of reports for the Property".
8.
9. Section 10.0, pages 71 through 74, the NDEP has the following comments:
    a. Page 72, item 1, the report indicates "the extent of contaminated soil cannot be determined at this time or if contaminated groundwater exists beneath the Property." Regarding groundwater, it is well documented that contaminated groundwater exists beneath the entire BMI Complex. This statement represents a lack of diligence in the report.
    b. Page 73, Item 3, based upon a review of historic aerial photographs it appears to the NDEP that the Trade Effluent Settling Ponds leached, leaked or weeped a significant amount of wastewater onto these Parcels. This issue should be discussed in greater detail. The report discusses that no plumbing was reportedly installed in the soil berms. This is contrary to the statement regarding the installation of French Drains. It is the NDEP's understanding that a French Drain is typically a perforated pipe that redirects ground water away from an area. Please explain and provide references.
10. Section 14.0, this Section lacks any reference to Site documents, please explain.
11. Four Acre Parcel not included in the report, the NDEP has the following comments:
    a. This parcel is located south of the Unit buildings and south of Parcels APN 178-13-101-002 and 178-12-401-009.
    b. This parcel was noted by TRX's contractor Basic Remediation Company (BRC) during a site visit with BRC. BRC noted that TRX would like to include this parcel as part of the Phase I. To date, no documentation has been provided to the NDEP.
    c. There is an earthen basin located on this parcel. BRC states that it is a stormwater basin and that the origin/use is unknown.
    d. There is an electrical vault on this parcel with unknown ownership and use. NDEP noted that it appears to be in line with the WAPA cable tunnel.
    e. Documentation is needed regarding this parcel.
12. APN 178-11-501-007, 178-12-101-002, 178-12-601-005 and 178-13-401-001

a. This group of parcels includes an area referred to by BRC as the "53 acre parcel" which is proposed for development first, once approved by the NDEP. This unnecessarily complicates the NDEP's review of the report and hence the comments provided by the NDEP. The comments below include these parcels discussed collectively and individually.
b. A number of debris piles, homeless camps, and other items were noted during the NDEP's site visit. All of these items should be shown on the Figures and discussed in the text.
c. There are a number of wells in this area and the chemical data from these wells should be discussed.
d. An abandoned baghouse of unknown origin was found on these parcels. This should be discussed and investigated, as necessary.
e. Multiple five gallon pails of what appears to be waste oil were found on these parcels. Some were open and spilled, others were not. This should be discussed and investigated, as necessary.
f. APN 178-11-501-007
    i. This Parcel is owned by Basic Environmental Company, it is the request of the NDEP that TRX reports address TRX parcels only.
g. APN 178-12-101-002
    i. This Parcel includes the Nevada Pick-A-Part facility. The Nevada Pick-A-Part facility appears to have significant and continuing impacts. If TRX is eventually seeking a No Further Action status for Parcel APN 178-12-101-002 it is suggested that the Nevada Pick-A-Part facility be removed from this Parcel. Alternately, investigation, remediation and restoration of the Nevada Pick-A-Part facility should commence. Regardless of what TRX chooses, investigation and remediation will be necessary to mitigate the impacts at the Site. In addition, based upon a review of the photographs this facility has been referred to the NDEP-Bureau of Waste Management for potential RCRA issues.
h. APN 178-13-401-001, this is the area formerly leased by Lavern Vohs. Please discuss how this report relates to the Phase I report previously completed for this area.

13. APN 178-12-101-003
    a. The Pioneer-Stauffer-Montrose (PSM) groundwater treatment system's (GWTS) extraction well field and possibly portions of the injection system are located on this parcel. Based upon NDEP field observations the various extraction well heads leak contaminated groundwater on to the land surface. This groundwater contains a number of RCRA compounds. This is not discussed in the report.
    b. The PSM GWTS extraction well field is not labeled on Figure 4.
    c. Add all wells, piezometers, etc. to the Figures and discuss data associated with these wells.
    d. Please discuss the historic French drain system constructed in association with the Trade Effluent Settling Ponds and its impacts to this parcel.

e. A number of debris piles were located on this parcel and these are not shown on the Figure. TRX needs to present more complete documentation for this report. In addition, one large debris pile appears to be located in a natural drainage area and has been strewn across the property from storm events. It is not clear if burning occurred in relation to this debris pile.

14. APN 178-12-201-005
    a. The PSM GWTS extraction well field and possibly portions of the injection system are located on this parcel. Based upon NDEP field observations the various extraction well heads leak contaminated groundwater on to the land surface. This groundwater contains a number of RCRA compounds. This is not discussed in the report.
    b. The PSM GWTS extraction well field is not labeled on Figure 4.
    c. Add all wells, piezometers, etc. to the Figures and discuss data associated with these wells.
    d. A number of debris piles were located on this parcel and these are not shown on the Figure. TRX needs to present more complete documentation for this report.
    e. Please discuss the historic French drain system constructed in association with the Trade Effluent Settling Ponds and its impacts to this parcel.
15. APN 178-12-401-009 and APN 178-13-101-002
    a. Figure 3, the NDEP has the following comments:
        i. There appears to be large piles of debris that are not labeled on this Figure. These had been removed by the time the NDEP had completed a site visit. It is necessary to correlate these piles to aerial photographs and investigate these areas, as necessary.
        ii. As noted above it is imperative that TRX identify and discuss the features displayed on this Figure.
    b. There is a building foundation on these parcels which appears similar to the peat building that was destroyed on the TIMET parcel. Please discuss what the use of this building was. Section 6.1 may address this issue but it is not clear.
    c. TRX notes that there is a monitoring well on this property; however, there is no discussion regarding the chemical data from these wells. Please note that there are several monitoring wells on this property, including an unlabeled 2" well on the south side of the property. In addition, it is expected that there are likely monitoring wells upgradient and downgradient of this Parcel that could be examined. Typically, impacts to groundwater are suggestive of impacts to soil on the Site or upgradient of the Site.
    d. TRX states that there is electrical equipment on this Parcel in a fenced area. The ownership and condition of this equipment needs to be assessed.
    e. Based upon the presence of large amount of staining and debris on this Parcel, the NDEP believes that additional investigation is necessary.

f. A remediation project was recently completed on the Parcel directly north of this Parcel (by TIMET). The Site to the north was contaminated with PCBs from electrical equipment.
g. There appear to be large aboveground storage tanks to the South of this area. Please discuss their status and historical uses. Also, to be noted portions of these tanks are included in the Parcel, however, as noted above the entire Parcel is not portrayed in the Figures.
h. It is the understanding of the NDEP that the former Hardesty Chemical/ AMECCO operation may have occurred directly south of this Parcel. Please discuss this issue.
i. A mobile aboveground storage tank is located on this parcel. Please discuss this.
j. The report displays only a portion of these Parcels. Please show the entire Parcel and explain the intention of the report. See also comments above.

16. APN 178-13-601-002 and APN 178-13-601-003
    a. These are the Parcels located along the southern extents of the TRX facility.
    b. During the NDEP's site visit the following was noted:
        i. There are debris piles west of the monitoring well in the middle portion of parcel APN 178-13-601-002 east of Van Wagonen. Please discuss what these piles are and what action will be taken to address these piles.
        ii. Parcel APN 178-13-601-003, there is a drainage feature east of the substation with an empty bucket of hydraulic fluid in it. Please discuss.
        iii. Channels have been incised where storm water appears to have traversed the property (including Basic Substation). Please discuss chemical impacts expected from this feature.
    c. TRX notes that there are five monitoring wells on this property; however, there is no discussion regarding the chemical data from these wells. Typically, impacts to groundwater are suggestive of impacts to soil on the Site or upgradient of the Site.
    d. The results of the *Upgradient Report* submitted by TRX to the NDEP would appear relevant to the discussion of these Parcels.
    e. In Section 8.0, page 64, TRX states "small areas of soil staining were observed throughout the parcels." It is the belief of the NDEP that these areas of soil staining require investigation.
    f. In Section 8.0, page 64, TRX states "Partially buried black plastic conduit was observed at various locations on the parcels." The NDEP believes that additional investigation is needed to determine the source of this material and what (if any) chemical impacts may have occurred as a result of this.
    g. In Section 8.0, page 64, TRX states "the parcels appeared to have been sprayed with a dust suppressant." It is necessary for TRX to investigate if these road areas of the Parcel were sprayed with a dust suppressant or not. Perhaps this was indicative of illegal chemical disposal rather than dust

suppression. The NDEP should not be expected to assume what has transpired on these Parcels. In addition, it is important to understand what type of dust suppressant was used. Historically, throughout the BMI Complex a variety of materials (including solvents) have been used as dust suppressants. Some of these historic dust suppressants may have impacted the Site. These road areas may require additional investigation.

h. Figure 2 portrays the WAPA switching yard as an isolated feature. TRX should review the available documentation on the WAPA facility. The WAPA facility has three yards which are connected by a subsurface tunnel. These yards and the subsurface tunnel have significant contamination associated with them. Storm drains associated with the various yards have likely transmitted contamination off-Site. This issue requires further review by TRX.

i. Figure 2, the NDEP has the following comments:
    i. The legend shows a symbol for the linetype used to delineate the WAPA Henderson switching station; however, this linetype is not visible on this Figure. In addition, this Site feature should be labeled explicitly.
    ii. The linetype for the natural gas lines is also not apparent on this Figure.
    iii. APN 178-13-601-003 shows the property line crossing through what appears to be an area of transformers north of Basic Substation. Additionally according to the Clark County Assessor website, the entire parcel is owned by the USA and the switching station is not a separate parcel. Please discuss these areas and their ownership. If the parcel is owned by USA it is not clear why it is included in this report.

17. Figure 1, it would be helpful if the Parcel numbers were shown on this Figure with arrows pointing to the general locations of the Parcels.
18. Appendix A, Figure 5, it appears that the Parcel labeled as APN 178-12-101-005 should be labeled as APN 178-12-**601**-005.

Brian Rakvica

From: Brian Rakvica

Sent: Thursday, May 10, 2007 6:51 AM

To: Brian Rakvica; 'Crowley, Susan'; Shannon Harbour

Cc: 'Bailey, Keith'; 'Bradley, Lisa'; 'Perry, Elizabeth'; 'Gerry, Dave'; 'Bilodeau, Sally'; 'rkennedy@ensr.aecom.com'

Subject: RE: Drinking & Groundwater>> FW: NDEP Comment

Susan,

In addition, as far as I can find there is no Federal MCL for copper. The Nevada reference cites a CFR but this is not an MCL this is the Federal MCL goal.

Also, it is interesting that TRX did not list the TDS number that is in the Nevada "MCL" table. Radium 226/228; gross alpha; gross beta were also missed.
FYI this is 1,000 ppm.
Background is less than 1,000 ppm; I believe that NDEP can demonstrate this.
As far as I am aware the groundwater law does not allow for any sort of mixing zone.

In addition, color was missed, I know this is something TRX has historically had an issue with in their discharge

I am not going to check this entire table, line by line, but we will likely check the final version.

It is suggested that this table be proofed for accuracy and revised for transparency per our previous discussions.

Also, to eliminate confusion we should agree on some terminology for the table.

For example, Nevada MCL is really a Nevada Primary Standard which really just references back to a Federal number. So I am not sure what the utility of this column is.

The only differences I have found are for secondary standards (which appear to differ slightly from the Federal) and for copper.

Then there are "special cases" like perchlorate and TDS as we have discussed.

If you have questions feel free to contact us at any time – I am available for the rest of the week or we can discuss on our call next week (my time next week is very limited).

Thanks,

Brian

From: Brian Rakvica
Sent: Wednesday, May 09, 2007 3:44 PM
To: 'Crowley, Susan'; Shannon Harbour; Brian Rakvica
Cc: Bailey, Keith; Bradley, Lisa; Perry, Elizabeth; Gerry, Dave; Bilodeau, Sally; rkennedy@ensr.aecom.com
Subject: RE: Drinking & Groundwater>> FW: NDEP Comment

Susan,

Here is what I have found...

For the following:

Aluminum, iron, magnesium, silver, chloride and sulfate – TRX is using "Secondary Standards" prescribed by NDEP-BSDW, I will have to check to see where these are derived. This is probably ok, but the basis needs to be clear in the table.

The problem is that for some there is a USEPA MCL listed, however, it appears that TRX may be using the drinking water health advisory – this needs clarification

Nickel does not have a Federal MCL but the number is derived from a Federal Regulation

Uranium and Xylenes have a Federal MCL

Combined radium226/228 has a Federal MCL

These are the only problems I have specifically found thus far.

Thanks,

Brian

From: Crowley, Susan [mailto:Susan.Crowley@tronox.com]
Sent: Wednesday, May 09, 2007 3:26 PM
To: Brian Rakvica; Shannon Harbour
Cc: Bailey, Keith; Bradley, Lisa; Perry, Elizabeth; Gerry, Dave; Bilodeau, Sally; rkennedy@ensr.aecom.com
Subject: FW: Drinking & Groundwater>> FW: NDEP Comment

Brian,
Please see the attached file and e-mail – forwarded to us from Judy Neubert, NDEP. In our last teleconference, the subject of NV MCL's came up and to further that discussion we wanted to pass along what we're utilizing and calling "NV MCL's". We recognize that use of these is not the only consideration when developing the comparison values .... But we wanted you to see where these "NV" numbers were derived. Is this table consistent with your information re "NV MCL's "? Your thoughts?

Susan Crowley
TRONOX LLC
PO Box 55
Henderson, NV 89009
p 702.651.2234
ef 405.302.4607
email susan.crowley@tronox.com

From: Judy A. Neubert [mailto:JNEUBERT@ndep.nv.gov]
Sent: Wednesday, March 28, 2007 11:51 AM
To: Kennedy, Robert
Cc: Russ Land; Sam Stegeman
Subject: RE: Drinking & Groundwater>> FW: NDEP Comment

Robert,

The Nevada Drinking Water page you referenced (http://water.nv.gov/Water%20Planning/wat-fact/drink.htm) is a bit out of date. There have been a few changes to the *drinking water standards and* Nevada Administrative code in the last few years that are not reflected on the Water Resources page. The Bureau of Safe Drinking Water writes and administers the Public

Water System regulations found under NAC 445A.450 - 445A.6731. The Bureau of Safe Drinking Water maintains a web site at: *http://ndep.nv.gov/bsdw/regulations.htm* *that addresses Public Water Systems and drinking water standards.*

Attached is a document that lists the current MCLs and the approved test methods. I can contact Water Resources and let them know that they may want to update their web page.

Please feel free to contact us at (775) 687-9521 or me at 687-9523.

Sincerely,

Judy Neubert, ES III
SDWIS Administrator
Nevada Division of Environmental Protection
Bureau of Safe Drinking Water
901 S. Stewart St., Ste 4001
Carson City NV 89701
ph: (775) 687-9523 fax: (775) 687-5699
www.ndep.nv.gov

From: Sam Stegeman
Sent: Tuesday, March 27, 2007 4:41 PM
To: 'rkennedy@ensr.aecom.com'; Judy A. Neubert; Russ Land
Subject: Q: Drinking & Groundwater>> FW: NDEP Comment

Robert, I've forwarding your inquiry to Judy Neubert in the NDEP Bureau of Safe Drinking Water. They are the folks who regulate and administer the drinking water program, whereas the Bureau of Water Quality Planning deals with surface water standards regulations.

Russ Land in the NDEP Bureau of Water Pollution Control may have some information related to your groundwater. Russ is supervisor of the BWPC well head protection program.

Hopefully, Judy will be able to answer your question or get someone who can.--sS

Nevada Division of Environmental Protection, Bureau of Water Quality Planning

Sam Stegeman
p: 775.687.9451
sstegema@ndep.nv.gov
Water Quality Standards
http://ndep.nv.gov/bwqp
NDEP: www.ndep.nv.gov
p:775.687.4670
f: 775.687.5856

E. Samuel Stegeman, P.E.
Supervisor, Water Quality Standards

Bureau of Water Quality Planning
Nevada Division of Environmental Protection
901 S. Stewart St., Ste. 4001
Carson City, NV 89701

From: Kennedy, Robert [mailto:rkennedy@ensr.aecom.com]
Sent: Tuesday, March 27, 2007 10:55 AM
To: Sam Stegeman
Cc: Sauer, Katherine
Subject: NDEP Comment

Mr. Stegeman,

We are investigating primary and secondary regulatory limits for drinking water in Nevada and there seems to be

a conflict between the information from the Nevada Division of Water Resources and the Department of Environmental Protection.
See http://water.nv.gov/Water%20Planning/wat-fact/drink.htm and http://www.leg.state.nv.us/NAC/NAC-445A.html#NAC445ASec455.

Can you tell me which information source is correct about the primary and secondary MCLs in Nevada?

This information is needed for a preliminary risk screening of groundwater data for a site in Nevada.

Thanks for your help.

Robert Kennedy
Senior Project Chemist

ENSR
2 Technology Park Drive
Westford, MA 01886-3140
T 978-589-3324 F 978-589-3282
www.ensr.aecom.com

Meeting Minutes

Project:	Tronox (Trx)
Location:	Tronox Henderson Facility
Time and Date:	9:00 AM, Tuesday May 8, 2007
In Attendance:	NDEP-BCA – Brian Rakvica, Shannon Harbour Tronox – Keith Bailey, Susan Crowley ENSR – Dave Gerry, Sally Bilodeau, Lisa Bradley (for Tronox) Neptune – Paul Black, Dave Gratson (for NDEP) Teri Copeland (for NDEP) Hackenberry Assoc. – Paul Hackenberry (for NDEP)

CC: Jim Najima

1. The meeting was held to discuss a variety of topics including the Phase A Report and Phase B Work Plan.
2. Phase A data validation: TRX submitted copies of the validated data sheets to NDEP. All of the data validation reports have been completed. TRX expects the completion of the data validation summary reports by May 18th. TRX will send a copy on CD of the data validation summary reports and all lab sheets to David Gratson.
3. Asbestos data not finished yet. Lisa Bradley will contact Paul Black with questions regarding the reporting of the asbestos data. Discussion regarding fiber width versus biologic availability.
4. Phase A Report: TRX supplied an outline for the Phase A Report. The following was discussed:
    a. TRX indicated that Section 6 will include the bases for the selection of the EA areas.
    b. Paul Black suggested that the background and upgradient data be discussed in Section 2.
    c. Chloroform map: NDEP likes the format of the map but suggested the addition of contaminant concentrations and contaminant iso-contours. NDEP requested that any maps illustrating groundwater concentrations should include adjacent property data.
    d. NDEP asked whether the Phase A report was going to rely on any historical data (diesel and chromium ponds data) as used in the CSM. TRX stated that the inclusion of historical data was not planned. Lisa Bradley agreed that it would be appropriate to use historical data in the Phase A report. NDEP and TRX had a discussion on whether the diesel and chromium ponds data had been validated but in a Nov '05 meeting, TRX stated that they couldn't located the support documents for validation of this data; therefore, the historical data will have to be used anecdotally in the Phase A report.
5. Comparison Levels: TRX supplied a draft Table 3-2 Site Related Chemicals Analyte List for Soil and Groundwater Samples for discussion.
    a. NDEP requested the URL for the NDWR Nevada MCL referenced in Table 3-2. Lisa Bradley stated that the NV MCL regulations were supplied by NDEP.

b. NDEP pointed out that in some cases the NV MCL was greater that the Federal MCL or a NV MCL was listed but no Federal MCL was listed.
c. NDEP suggested that the provisional action level of 18 ug/L be used for perchlorate in groundwater. The NDEP has not determined an action level for perchlorate in soil.
d. NDEP suggested that the screening level (Beneficial Use Standard for Las Vegas Wash) of 1,900 mg/L be used for TDS; otherwise, the more restrictive Federal secondary MCL would need to be used. TRX to propose screening level for TDS. **ACTION ITEM.**
e. NDEP suggested adding a column in Table 3-2 for the basis for the selection of the screening level.
f. NDEP pointed out that leaching pathway was not considered in the screening levels used in Table 3-2 and that the leaching pathway will reduce the screening level for several of the constituents such as Magnesium. TRX stated that this screening is for direct contact pathway only and that the leaching pathway will be considered separately.
g. TRX stated that Mg was not being considered for additional characterization since it is an essential nutrient. NDEP disagreed with this logic stating that due to the toxicity level of Mg and the use of Mg as a signature constituent for characterization. The zeros listed in Table 3-2 for Mg should be replaced with "--".
h. Background data for Arsenic will be combined at the end.
i. TRX suggested a soil screening level for dioxin/furans on 1 ug/kg. This screening level was derived in two ways: 1) using the high point in the ASTDR residential range and 2) using one tenth 10 ug/kg, which is less than the midpoint of the OSWER directive for the industrial range.
j. Paul Black stated that EPA Region IX is no longer maintaining the PRG database.

6. Evaluation Areas (EAs) for Phase B: TRX submitted a draft figure illustrating the eleven proposed EAs for the Phase B Work Plan and Report. TRX stated that the EAs are based on current, future, and historical use.
    a. Units 4 and 5 have same process history.
    b. EA1, EA2, EA3, and EA11 represent areas shown in Phase I report.
7. Paul Black requested that the x-y coordinates for each analyte be added to the database. TRX will check to see if this information is included in their database. **ACTION ITEM.**
8. David Gratson stated that the Data Validation Qualifiers were not used for all data sets. For example, J+/J- were only used for inorganics.
9. NDEP and TRX discussed the format for analytical data. NDEP has not finished review of TRX submitted format. TRX stated that their format is close to BRC's format with the additional of a few fields.
10. Schedule update:
    a. Phase A report / Phase B Work Plan: End of July 2007
    b. Phase B sampling report: October 2007
    c. Risk Assessment: 2nd Half 2008
    d. Next Call: 11:00 AM June 6, 2007

Brian Rakvica

From: Brian Rakvica
Sent: Monday, May 07, 2007 1:39 PM
To: 'Bailey, Keith'; Crowley, Susan; Gerry, Dave; Bilodeau, Sally; Ho, Brian
Cc: Shannon Harbour
Subject: RE: NDEP OK on Phase A GW Resampling

Keith, et. al.,

Just to be clear...there are a few points to this:

If the low flow protocol is not being followed and the samples are turbid we have not proven anything.

If the low flow protocol is followed and the samples are still turbid we either have well screen, sedimentation, well development, well construction problems or something else.

If the low low flow protocol is used and provides better results than standard low flow we know that the flow is at least partially the issue, but the well issues (listed above) may still be unresolved.

If the low low flow protocol provides no better results we still need to look into the well issues (listed above).

Please be cautious about the conclusions that can be drawn from this data collection effort.

NDEP does not require anything further on this issue.

Thanks,

Brian

From: Bailey, Keith [mailto:Keith.Bailey@tronox.com]
Sent: Monday, May 07, 2007 12:23 PM
To: Crowley, Susan; Gerry, Dave; Bilodeau, Sally; Ho, Brian
Cc: Brian Rakvica
Subject: NDEP OK on Phase A GW Resampling

All,

Brian Rakvica called this morning and we discussed the Phase A GW resampling. Brian understands our plan for three samples at each location and the reasoning for them. He will approve the Work Plan addendum. He is concerned that Tronox/ENSR watch the regular sampling protocol closely, in the future, to avoid samples with high turbidity.

Keith Bailey
Tronox LLC
PO Box 268859
Oklahoma City, OK 73126-8859
(405) 775-6526 office
(405) 850-3079 cell

(405) 775-6562 fax

TRX

5/4/07

TRX @ 8:00 - lab report

- Neptune talked w/ Lisa Bradley + ENSR
- also discussed lab report
- ENSR is "all set"

5/3/07

Brian Rakvica

From: Crowley, Susan [Susan.Crowley@tronox.com]

Sent: Thursday, May 03, 2007 10:24 AM

To: Brian Rakvica; Shannon Harbour

Cc: Bailey, Keith

Subject: Docs for Review for the May 8th Teleconference

Attachments: Hend ECA NDEP call Agenda 4-07.doc; chloroform-soil May 1, 2007 draft.pdf; Draft EA Map 04-27-07 rev 2.pdf; Draft Phase A Report Organization - May 1-07.doc

Brian and Shannon,

Attached is a simple agenda for our teleconference on May 8th. In addition to the topics we'd like to cover, a call-in number is provided on the agenda so all can call in individually if needed.

In addition, we've provided several DRAFT docs for you to get a look at. They are:

- A Phase A report organization description (Section 1.3 of the report).
- One of the draft figures displaying analytical results, chloroform in this case.
- A very draft figure displaying the evaluation areas to consider as we move into the risk assessment.

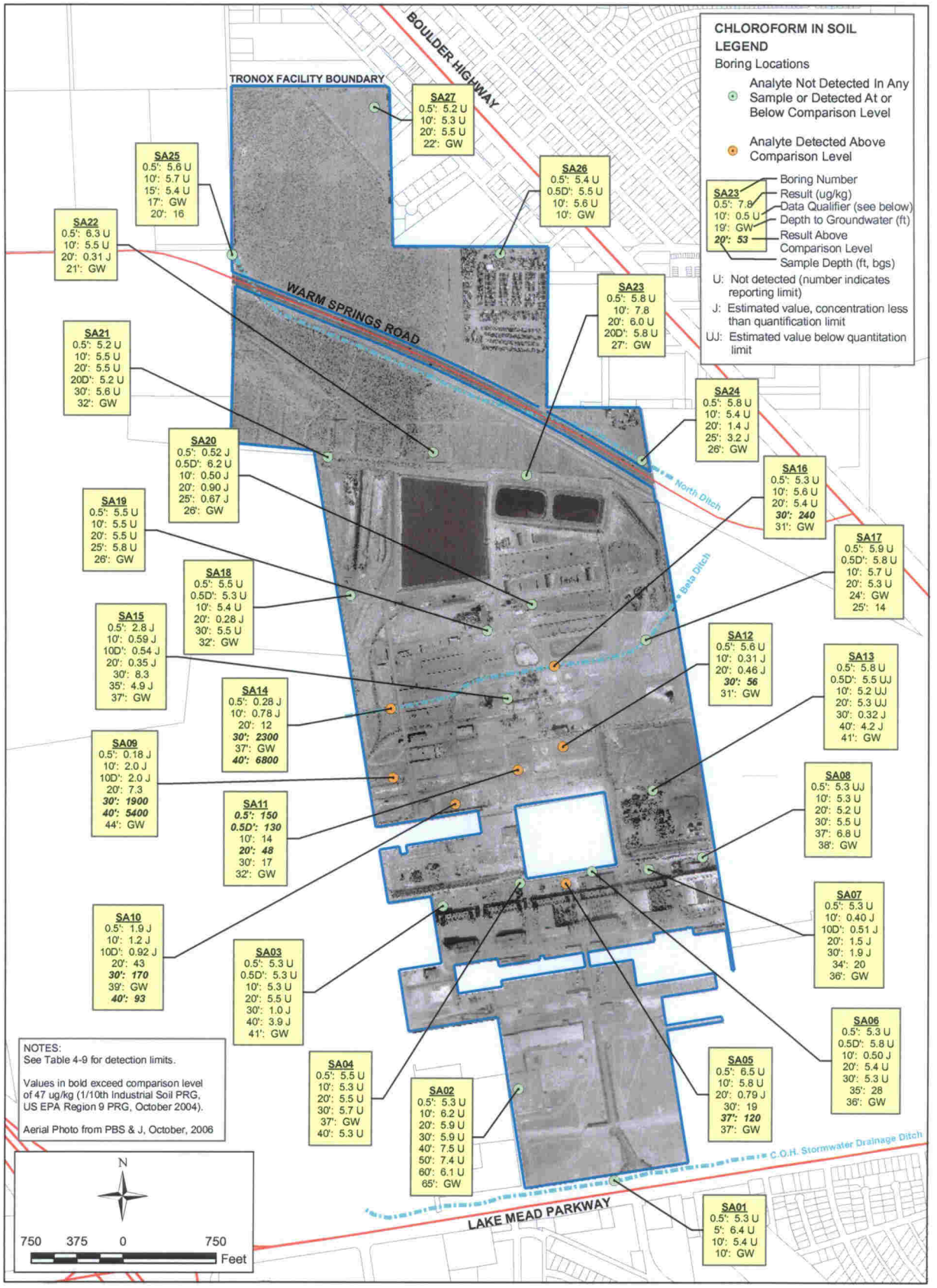
We'll have Lisa Bradley (and Elizabeth Perry if possible) on the phone with us for discussion of the topics. I've set the teleconference up for 12 lines in, we'll use 5. If you would like more lines available for your end just let me and I'll increase the set. Also .... If you have any immediate questions about the attachments please feel free to call Keith or I - even before the teleconference. Thanks ... talk with you then.

Susan Crowley
TRONOX LLC
PO Box 55
Henderson, NV 89009
p 702.651.2234
ef 405.302.4607
email susan.crowley@tronox.com

Agenda - DRAFT
Tronox/NDEP ECA Status Call
May 8, 2007 9:00 a.m. PDT
Call-in # 866-673-0541 code 2234

1. Phase A data validation
   a. Data spreadsheets
   b. Data Validation Summary Reports
   c. Asbestos
2. Request to amend Phase A work plan (filtered GW samples)
3. Proposed Phase A report outline (section 1.3)
4. Phase A figure template (chloroform)
5. Background data including Upgradient information
6. Comparison levels
7. Site "Evaluation Areas" for Phase B/Risk Assessment
8. Schedule update
   a. Phase A report/Phase B work plan
   b. Phase B sampling/report
   c. Risk Assessment
   d. Next call

J:\TronoxGIS\mxd\402-SourceAreaPhaseA\chloroform-soil.mxd



SHEET NUMBER: X	FIGURE NUMBER: 4

CHLOROFORM IN SOIL
SOURCE AREA INVESTIGATION
PHASE A
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
1:9,000	MAY 2007	04020-023-402

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B HO	NO:	DESCRIPTION:	DATE:	BY:
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T MCADAM				
CHECKED BY:				
B HO				
APPROVED BY:				
D GERRY				

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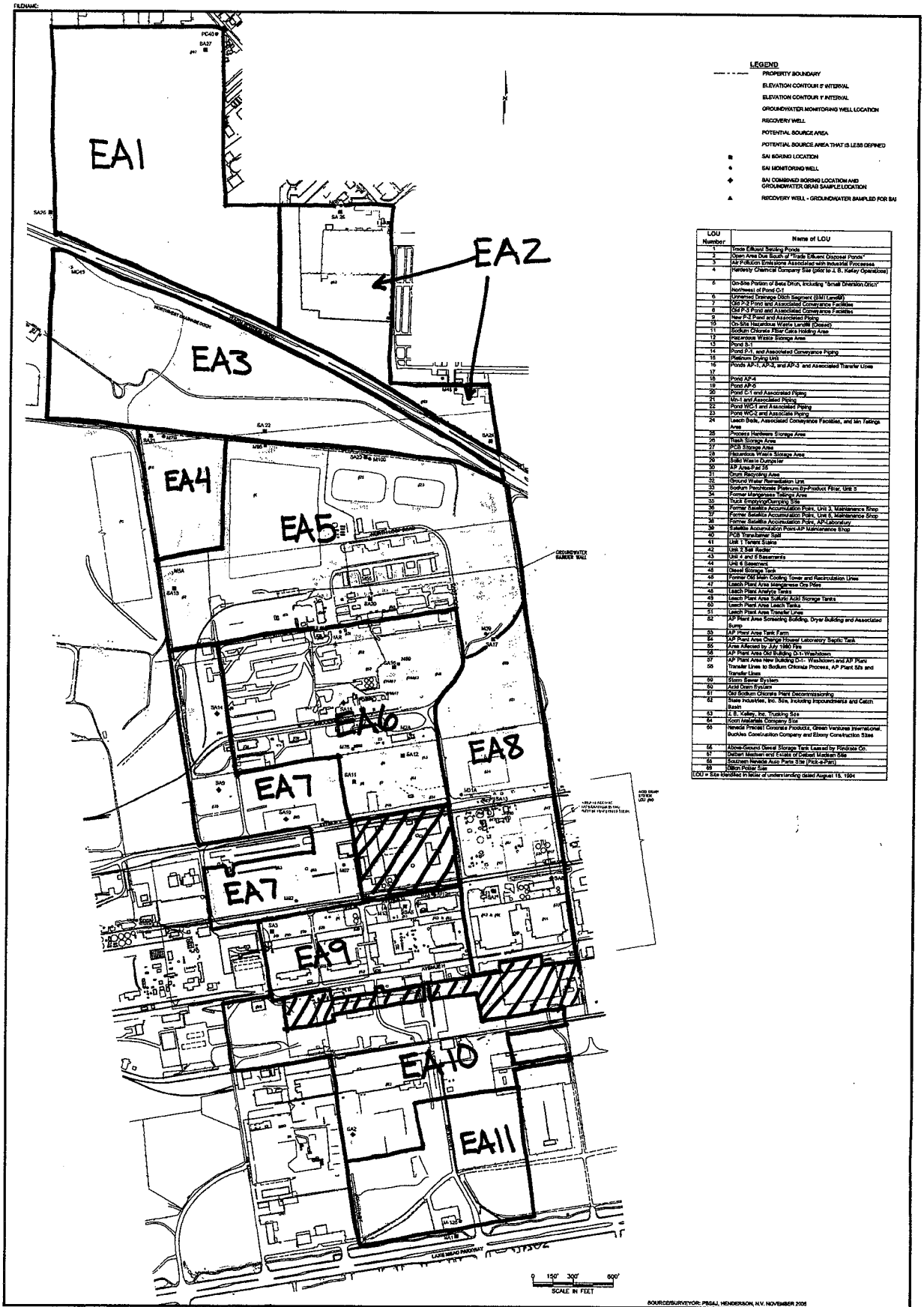

LEGEND

- PROPERTY BOUNDARY
- ELEVATION CONTOUR 5' INTERVAL
- ELEVATION CONTOUR 1' INTERVAL
- GROUNDWATER MONITORING WELL LOCATION
- RECOVERY WELL
- POTENTIAL SOURCE AREA
- POTENTIAL SOURCE AREA THAT IS LESS DEFINED
- SAI BORING LOCATION
- SAI MONITORING WELL
- SAI COMBINED BORING LOCATION AND GROUNDWATER GRAB SAMPLE LOCATION
- RECOVERY WELL - GROUNDWATER SAMPLED FOR SAI

LOU Number	Name of LOU
1	Trade Effluent Settling Ponds
2	Open Area Due South of "Trade Effluent Disposal Ponds"
3	Air Pollution Emissions Associated with Industrial Processes
4	Nehlsenly Chemical Company Site (prior to J. B. Kelley Operations)
5	On-Site Portion of Beta Ditch, including "Small Diversion Ditch" Northeast of Pond C-1
6	Unnamed Drainage Ditch Segment (BMI Landfill)
7	Old P-2 Pond and Associated Conveyance Facilities
8	Old P-3 Pond and Associated Conveyance Facilities
9	New P-2 Pond and Associated Piping
10	On-Site Hazardous Waste Landfill (Closed)
11	Sodium Chlorate Filter Cake Holding Area
12	Hazardous Waste Storage Area
13	Pond S-1
14	Pond P-1, and Associated Conveyance Piping
15	Platinum Drying Unit
16	Ponds AP-1, AP-2, and AP-3 and Associated Transfer Lines
17	
18	Pond AP-4
19	Pond AP-5
20	Pond C-1 and Associated Piping
21	Mn-1 and Associated Piping
22	Pond WC-1 and Associated Piping
23	Pond WC-2 and Associate Piping
24	Leach Beds, Associated Conveyance Facilities, and Mn Tailings Area
25	Process Hardware Storage Area
26	Trash Storage Area
27	PCB Storage Area
28	Hazardous Waste Storage Area
29	Solid Waste Dumpster
30	AP Area P-Pad 35
31	Drum Recycling Area
32	Ground Water Remediation Unit
33	Sodium Perchlorate Platinum By-Product Filter, Unit 3
34	Former Manganese Tailings Area
35	Truck Emptying/Dumping Site
36	Former Satellite Accumulation Point, Unit 3, Maintenance Shop
37	Former Satellite Accumulation Point, Unit 6, Maintenance Shop
38	Former Satellite Accumulation Point, AP Laboratory
39	Satellite Accumulation Point AP Maintenance Shop
40	PCB Transformer Spill
41	Unit 1 Tenant Drums
42	Unit 2 Salt Redler
43	Unit 4 and 5 Basements
44	Unit 6 Basement
45	Diesel Storage Tank
46	Former Old Main Cooling Tower and Recirculation Lines
47	Leach Plant Area Manganese Ore Piles
48	Leach Plant Analyte Tanks
49	Leach Plant Area Sulfuric Acid Storage Tanks
50	Leach Plant Area Leach Tanks
51	Leach Plant Area Transfer Lines
52	AP Plant Area Screening Building, Dryer Building and Associated Bunks
53	AP Plant Area Tank Farm
54	AP Plant Area Change House/ Laboratory Septic Tank
55	Area Affected by July 1960 Fire
56	AP Plant Area Old Building D-1- Washdown
57	AP Plant Area New Building D-1- Washdown and AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant Sits and Transfer Lines
58	Storm Sewer System
60	Acid Drain System
61	Old Sodium Chlorate Plant Decommissioning
62	Stolo Industries, Inc. Site, Including Impoundments and Catch Basin
63	J. B. Kelley, Inc. Trucking Site
64	Kerr Industrials Company Site
65	Nevada Precast Concrete Products, Green Ventures International, Buckles Construction Company and Ebony Construction Sites
66	Above-Ground Diesel Storage Tank Leased by Pinkdale Co.
67	Delbert Madsen and Estate of Delbert Madsen Site
68	Southern Nevada Auto Parts Site (Pick-a-Part)
69	Dillon Power Site

LOU = Site identified in letter of understanding dated August 15, 1994

SOURCE/SURVEYOR: PS&J, HENDERSON, N.V. NOVEMBER 2006

SHEET NUMBER: 1

DRAWING NUMBER: X

SAMPLING POINT LOCATIONS

Source Area Investigation: Phase A
Tronox Facility
Henderson, Nevada

SCALE:	DATE:	PROJECT NUMBER:
1" = 300'	1/16/2007	04000-023-402

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DESIGNED BY:	REVISIONS			
B. Ho	NO.:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
M. Scop				
CHECKED BY:				
S. Bilodeau				
APPROVED BY:				
D. Gerry				

TRONOX

1.3 Report Organization

The Phase A Source Area Investigation report is organized as follows:

Section 1 is the introduction and describes the purpose of the source area investigation. The objectives of the investigation, along with a brief history of the Site are presented, and the section concludes with a summary of the environmental conditions at the Site.

Section 2 discusses the physical setting of the Site, including site location, site topography, climate, regional and local geology/hydrogeology, and a brief summary of the results of background studies from adjacent areas and the upgradient investigation performed at the Site.

Section 3 describes the Phase A Source Area Investigation activities including the field activities, sample handling and management, and a discussion of the procedures by which the laboratory data were evaluated.

Section 4 presents results of the Phase-A investigation, including a discussion of the geology encountered and the laboratory results for the soil and groundwater samples that were analyzed.

Section 5 provides a comparison of Phase A analytical results with background and regulatory limits for each constituent. Recommendations are made on SRCs thought to be adequately characterized for future risk assessment and on constituents which will require additional investigation.

Section 6 evaluates approaches for a subsequent Phase B Site Investigation and recommends a path forward. Separation of the Site into "Evaluation Areas" for future risk assessment is proposed to ensure that the Phase B study generates adequate sample coverage and the appropriate number of samples for the future risk assessment.

Section 7 provides a bibliographic list for each of the references that were cited in this document.

Note that a complete Phase B Site Investigation Work Plan will be included as an Appendix, for approval by NDEP.

5/1/07

Re-Sampling of the Phase A Source Area Investigation Wells

Background: Analytical results of the groundwater samples from Phase A of the Source Area Investigation at the Tronox facility indicated that the results for metals and radionuclides may have been affected by the turbidity of the water samples. The 21 wells were sampled using low-flow techniques with pump rates varying (from well-to-well) between 100 milliliters per minute (ml/min) and 480 ml/min. Pump rates varied depending upon the maximum rate that yielded relatively stable water levels with minimal (<3-inches) drawdown.

At the pump rates listed above, turbidity of the groundwater varied between seven and 148 NTUs (nephelometric turbidity units).

Objectives: To assess the potential for analytical bias of metals and radionuclides groundwater results based on sampling methodology.

Scope of Work: Three samples will be collected from each of the 21 wells. Each sample will be collected using a different method in a sequential manner described as follows:

1. Low Low-Flow Sampling (Unfiltered): After water levels have been measured, each well will be purged at a pump rate of no more than 100 ml/min, if possible. During purging, the turbidity will be monitored and groundwater samples for metals and radionuclides will be collected once the following criteria have been met:

    a. Turbidity levels of 50 NTUs (or less) are achieved for three consecutive readings, and
    b. Other water quality parameters (pH, conductivity, etc.) have stabilized (± 10%), and
    c. Water levels are stable (< 3-inches drawdown).

    If turbidity levels of 50 NTUs or less cannot be achieved, then sample containers will be filled when turbidity levels have stabilized (± 10%) for three consecutive readings. For each well, field parameters will be recorded on groundwater sampling field data sheets (the same type of field data sheets described in the Phase A Work Plan [ENSR 2006]).

2. Low-Flow Sampling (Filtered): Each well will be pumped at the same rate that was used in the December 2006 sampling event (see Table 1). Field parameters will be measured. When the criteria (a through c) described in Step 1 have been met, the groundwater will be filtered using a peristaltic pump and 0.45 micron disposable filter to remove suspended particulate matter before the groundwater is placed in the sample containers.

3. Low-Flow Sampling (Unfiltered): Each well will be pumped at the same rate that was used in the December 2006 sampling event. Field parameters will be measured and

when the criteria (a through c) described in Step 1 have been met, the groundwater sample containers will be filled.

As shown in the attached **Table 1**, quality assurance/quality control (QA/QC) samples consisting of field duplicates, field blanks, equipment blanks, and a pump rinsate blank will also be collected using the same sampling frequency as that described in the Phase A Work Plan (ENSR 2006). The samples will be sent to the same NDEP-certified laboratories as those used in the Phase A investigation, and the same analytical methods will be used as described in the Phase A Work Plan (ENSR 2006).

Data Evaluation: The analytical results from the three sampling methods will be evaluated as follows:

- The results from the Low-Flow unfiltered samples will serve as a baseline for comparison to the other two methods and for comparison to the December 2006 sample results.
- The Low-Flow filtered and unfiltered samples will be compared to evaluate the effects of sediment in water samples on the metals and radionuclide analytical results.
- The Low Low-Flow unfiltered sample results will be evaluated to determine whether a standard pump rate of 100 ml/min can produce stable, but minimal turbidity in water samples, and whether the analytical results for metals and radionuclides are affected.
- The Low Low-Flow unfiltered sample results will be compared to the Low-Flow filtered samples to assess how the different sampling methods affect the analytical results for metals and radionuclides.

Reporting: The results of the re-sampling of the Phase A wells will be presented in the report on the Phase B findings of the Source Area Investigation.

References

ENSR 2006, Phase A Source Area Investigation Workplan, Tronox LLC Facility, Henderson, Nevada, September 2006.

Table 1
Groundwater Sampling and Analytical Plan
May 2007 Re-Sampling of Phase A Wells
Tronox Facility - Henderson, Nevada

Well No.	Sampling Plan						Analytical Plan (per sample)			
	Sample Type	Sample 1: Low-Low flow sampling (100 m/min) unfiltered	Sample 2: Low flow using Dec '06 pump rates filtered	Sample 3: Low flow using Dec '06 pump rates unfiltered	Dec 2006 pump rate ml/min	Dec 2006 Turbidity (NTUs)	Metals (6010B)	Cr 6 (7196 or 7199)	gamma spec Ra-226&-228 (903.1 & 904.0)	alpha spec U & Th isotopes for secular equilibrium
M2A		X	X	X	350	49	X	X	X	
M5A		X	X	X	200	7	X	X	X	
M7B		X	X	X	290	16	X	X	X	
M11		X	X	X	150	89.5	X	X	X	
M12A		X	X	X	210	19.7	X	X	X	
M13		X	X	X	300	32.4	X	X	X	
M31A		X	X	X	150	155	X	X	X	X
M39	parent	X	X	X	320	62.9	X	X	X	X
M39D	duplicate	X	X	X	320	62.9	X	X	X	X
M48		X	X	X	350	nm*	X	X	X	
M55		X	X	X	360	nm*	X	X	X	
M76		X	X	X	100	0.1	X	X	X	
M89		X	X	X	235	0.3	X	X	X	
M92		X	X	X	280	76	X	X	X	
M95	parent	X	X	X	480	68.8	3	X	X	X
M95D	duplicate	X	X	X	480	68.8	X	X	X	X
M97		X	X	X	380	31.7	X	X	X	
M98		X	X	X	300	nm*	X	X	X	
M100		X	X	X	360	nm*	X	X	X	
M120		X	X	X	320	1.8	X	X	X	
MC45		X	X	X	290	0.5	X	X	X	
PC40		X	X	X	420	149	X	X	X	
IAR		ns	X	X	2000	nm*	X	X	X	
QA/QC Samples										
Field Blanks							X	X	X	X
Equipment Blanks							X	X	X	X
Pump Rinsate							X	X	X	X

ns not sampled because well has permanent pump in it.

Shannon Harbour

From: Shannon Harbour
Sent: Tuesday, May 01, 2007 2:10 PM
To: 'Crowley, Susan'
Cc: Brian Rakvica; Todd Croft; Bailey, Keith
Subject: RE: Extension of Time for Providing a Groundwater Capture Evaluation Work Plan

Susan,

This is acceptable to the NDEP.

Sincerely,
Shannon

Shannon Harbour, P.E.
Bureau of Corrective Actions
NDEP-Las Vegas Office

From: Crowley, Susan [mailto:Susan.Crowley@tronox.com]
Sent: Monday, April 30, 2007 3:49 PM
To: Shannon Harbour
Cc: Brian Rakvica; Todd Croft; Bailey, Keith
Subject: Extension of Time for Providing a Groundwater Capture Evaluation Work Plan

Shannon,
During our April 25th teleconference with NDEP we discussed an extension of time for providing NDEP a Work Plan for evaluation of groundwater capture. We offered May 25th, which coincides with the due date for the next performance report. Is this OK?

Susan Crowley
TRONOX LLC
PO Box 55
Henderson, NV 89009
p 702.651.2234
ef 405.302.4607
email susan.crowley@tronox.com

Shannon Harbour

From: Shannon Harbour
Sent: Tuesday, May 01, 2007 2:09 PM
To: 'Crowley, Susan'
Cc: Brian Rakvica; Todd Croft; Bailey, Keith
Subject: RE: Time Extension for Providing an Annotated RTC for the January 07 Remediation Report

Susan,

This is acceptable to the NDEP.

Sincerely,
Shannon

Shannon Harbour, P.E.
Bureau of Corrective Actions
NDEP-Las Vegas Office

From: Crowley, Susan [mailto:Susan.Crowley@tronox.com]
Sent: Monday, April 30, 2007 3:44 PM
To: Shannon Harbour
Cc: Brian Rakvica; Todd Croft; Bailey, Keith
Subject: Time Extension for Providing an Annotated RTC for the January 07 Remediation Report

Shannon,
In our April 25th teleconference with NDEP, Tronox requested an extension of the due date for the annotated response to comment re the Tronox performance report for ClO4 and Cr remedial projects. During that call we offered May 25th, the due date for the next performance report (60 days following the end of the quarter). Is this OK?

Susan Crowley
TRONOX LLC
PO Box 55
Henderson, NV 89009
p 702.651.2234
ef 405.302.4607
email susan.crowley@tronox.com

Brian Rakvica

From: Brian Rakvica
Sent: Tuesday, May 01, 2007 9:49 AM
To: Brian Rakvica; 'Crowley, Susan'; Shannon Harbour; 'Paul S. Hackenberry, Jr.'
Cc: 'Bailey, Keith'; 'Ho, Brian'; 'Bilodeau, Sally'; 'Gerry, Dave'
Subject: RE: Work Plan Addendum to the Tronox Phase A Source Area Evaluation

Also, please note that water quality parameters are considered stable when three consective readings are collected for

+-0.1 pH
+- 3% conductivity
+- 10 mv redox potential
+- 10% for turbidity and DO

The addendum does not match this

Thanks,

Brian

From: Brian Rakvica
Sent: Tuesday, May 01, 2007 9:45 AM
To: 'Crowley, Susan'; Shannon Harbour; 'Paul S. Hackenberry, Jr.'
Cc: Bailey, Keith; Ho, Brian; Bilodeau, Sally; Gerry, Dave; Brian Rakvica
Subject: RE: Work Plan Addendum to the Tronox Phase A Source Area Evaluation

Susan, et. al.,

My only question is:

What is the purpose of the "low low flow sampling"?

These flow rates will be nearly infeasible/impractical for long term monitoring.

In addition, what is proposed via "low flow sampling "unfiltered" is in accordance with the available guidance.

If wells are exhibiting high turbidity under these conditions it is likely that a different issue needs to be investigated...e.g.: well screen selection/condition; well construction, etc.

NDEP does not have any objection to completing the "low low flow sampling" , however, it is a concern that the data may be of limited use. In addition, given the fact that each lab analyses will be >$1,000, resources may be better allocated?

Please advise.

Thanks,

Brian

From: Crowley, Susan [mailto:Susan.Crowley@tronox.com]

Sent: Tuesday, May 01, 2007 9:21 AM
To: Brian Rakvica; Shannon Harbour
Cc: Bailey, Keith; Ho, Brian; Bilodeau, Sally; Gerry, Dave
Subject: Work Plan Appendum to the Tronox Phase A Source Area Evaluation

Brian,

Please find attached an addendum to our Phase A Work Plan for the Tronox Source Area Investigation. In our April 25th teleconference we covered the need to understand the groundwater metals concentrations obtained during the Phase A field sampling and the apparent effect of filtering vs. non-filtering (and low-flow vs. very low-flow sampling). The attached Work Plan is intended to give us more information on the topic and is a continuation of the Phase A work.

Please provide us any comment you have? We expect to be in the field very soon. Thanks for your consideration.

Susan Crowley
TRONOX LLC
PO Box 55
Henderson, NV 89009
p 702.651.2234
ef 405.302.4607
email susan.crowley@tronox.com

Brian Rakvica

From: Crowley, Susan [Susan.Crowley@tronox.com]
Sent: Tuesday, May 01, 2007 9:21 AM
To: Brian Rakvica; Shannon Harbour
Cc: Bailey, Keith; Ho, Brian; Bilodeau, Sally; Gerry, Dave
Subject: Work Plan Appendum to the Tronox Phase A Source Area Evaluation
Attachments: Phase A Addendum for Re-Sampling Selected Wells for Filtered vs Non-Filtered Metals.pdf

Brian,

Please find attached an addendum to our Phase A Work Plan for the Tronox Source Area Investigation. In our April 25th teleconference we covered the need to understand the groundwater metals concentrations obtained during the Phase A field sampling and the apparent effect of filtering vs. non-filtering (and low-flow vs. very low-flow sampling). The attached Work Plan is intended to give us more information on the topic and is a continuation of the Phase A work.

Please provide us any comment you have? We expect to be in the field very soon. Thanks for your consideration.

Susan Crowley
TRONOX LLC
PO Box 55
Henderson, NV 89009
p 702.651.2234
ef 405.302.4607
email susan.crowley@tronox.com

Re-Sampling of the Phase A Source Area Investigation Wells

Background: Analytical results of the groundwater samples from Phase A of the Source Area Investigation at the Tronox facility indicated that the results for metals and radionuclides may have been affected by the turbidity of the water samples. The 21 wells were sampled using low-flow techniques with pump rates varying (from well-to-well) between 100 milliliters per minute (ml/min) and 480 ml/min. Pump rates varied depending upon the maximum rate that yielded relatively stable water levels with minimal (<3-inches) drawdown.

At the pump rates listed above, turbidity of the groundwater varied between seven and 148 NTUs (nephelometric turbidity units).

Objectives: To assess the potential for analytical bias of metals and radionuclides groundwater results based on sampling methodology.

Scope of Work: Three samples will be collected from each of the 21 wells. Each sample will be collected using a different method in a sequential manner described as follows:

1. Low Low-Flow Sampling (Unfiltered): After water levels have been measured, each well will be purged at a pump rate of no more than 100 ml/min, if possible. During purging, the turbidity will be monitored and groundwater samples for metals and radionuclides will be collected once the following criteria have been met:

    a. Turbidity levels of 50 NTUs (or less) are achieved for three consecutive readings, and
    b. Other water quality parameters (pH, conductivity, etc.) have stabilized (± 10%), and
    c. Water levels are stable (< 3-inches drawdown).

    If turbidity levels of 50 NTUs or less cannot be achieved, then sample containers will be filled when turbidity levels have stabilized (± 10%) for three consecutive readings. For each well, field parameters will be recorded on groundwater sampling field data sheets (the same type of field data sheets described in the Phase A Work Plan [ENSR 2006]).

2. Low-Flow Sampling (Filtered): Each well will be pumped at the same rate that was used in the December 2006 sampling event (see Table 1). Field parameters will be measured. When the criteria (a through c) described in Step 1 have been met, the groundwater will be filtered using a peristaltic pump and 0.45 micron disposable filter to remove suspended particulate matter before the groundwater is placed in the sample containers.

3. Low-Flow Sampling (Unfiltered): Each well will be pumped at the same rate that was used in the December 2006 sampling event. Field parameters will be measured and

when the criteria (a through c) described in Step 1 have been met, the groundwater sample containers will be filled.

As shown in the attached **Table 1**, quality assurance/quality control (QA/QC) samples consisting of field duplicates, field blanks, equipment blanks, and a pump rinsate blank will also be collected using the same sampling frequency as that described in the Phase A Work Plan (ENSR 2006). The samples will be sent to the same NDEP-certified laboratories as those used in the Phase A investigation, and the same analytical methods will be used as described in the Phase A Work Plan (ENSR 2006).

Data Evaluation: The analytical results from the three sampling methods will be evaluated as follows:

- The results from the Low-Flow unfiltered samples will serve as a baseline for comparison to the other two methods and for comparison to the December 2006 sample results.
- The Low-Flow filtered and unfiltered samples will be compared to evaluate the effects of sediment in water samples on the metals and radionuclide analytical results.
- The Low Low-Flow unfiltered sample results will be evaluated to determine whether a standard pump rate of 100 ml/min can produce stable, but minimal turbidity in water samples, and whether the analytical results for metals and radionuclides are affected.
- The Low Low-Flow unfiltered sample results will be compared to the Low-Flow filtered samples to assess how the different sampling methods affect the analytical results for metals and radionuclides.

Reporting: The results of the re-sampling of the Phase A wells will be presented in the report on the Phase B findings of the Source Area Investigation.

References

ENSR 2006, Phase A Source Area Investigation Workplan, Tronox LLC Facility, Henderson, Nevada, September 2006.

Table 1
Groundwater Sampling and Analytical Plan
May 2007 Re-Sampling of Phase A Wells
Tronox Facility - Henderson, Nevada

	Sampling Plan						Analytical Plan (per sample)			
Well No.	**Sample Type**	**Sample 1: Low-Low flow sampling (100 m/min) unfiltered**	**Sample 2: Low flow using Dec '06 pump rates filtered**	**Sample 3: Low flow using Dec '06 pump rates unfiltered**	**Dec 2006 pump rate ml/min**	**Dec 2006 Turbidity (NTUs)**	**Metals (6010B)**	**Cr 6 (7196 or 7199)**	**gamma spec Ra-226&-228 (903.1 & 904.0)**	**alpha spec U & Th isotopes for secular equilibrium**
M2A		X	X	X	350	49	X	X	X	
M5A		X	X	X	200	7	X	X	X	
M7B		X	X	X	290	16	X	X	X	
M11		X	X	X	150	89.5	X	X	X	
M12A		X	X	X	210	19.7	X	X	X	
M13		X	X	X	300	32.4	X	X	X	
M31A		X	X	X	150	155	X	X	X	X
M39	parent	X	X	X	320	62.9	X	X	X	X
M39D	duplicate	X	X	X	320	62.9	X	X	X	X
M48		X	X	X	350	nm*	X	X	X	
M55		X	X	X	360	nm*	X	X	X	
M76		X	X	X	100	0.1	X	X	X	
M89		X	X	X	235	0.3	X	X	X	
M92		X	X	X	280	76	X	X	X	
M95	parent	X	X	X	480	68.8	3	X	X	X
M95D	duplicate	X	X	X	480	68.8	X	X	X	X
M97		X	X	X	380	31.7	X	X	X	
M98		X	X	X	300	nm*	X	X	X	
M100		X	X	X	360	nm*	X	X	X	
M120		X	X	X	320	1.8	X	X	X	
MC45		X	X	X	290	0.5	X	X	X	
PC40		X	X	X	420	149	X	X	X	
IAR		ns	X	X	2000	nm*	X	X	X	
QA/QC Samples										
Field Blanks							X	X	X	X
Equipment Blanks							X	X	X	X
Pump Rinsate							X	X	X	X

ns not sampled because well has permanent pump in it.

FINAL

Meeting Minutes

Project:	Tronox (TRX)
Location:	Conference Call
Time and Date:	9:00 AM, April 25, 2007
Meeting Number:	---
In Attendance:	NDEP-BCA – Brian Rakvica, Shannon Harbour, Todd Croft Tronox – Keith Bailey, Susan Crowley

CC: Jim Najima

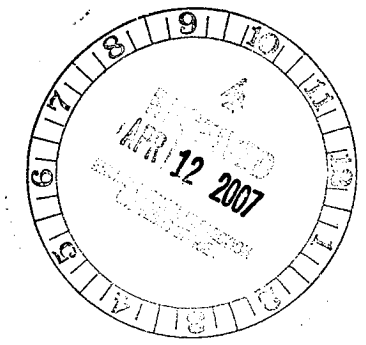
1. This conference call was held to discuss a variety of issues including NDEP's March 29, 2007 comment letter Re: *Semi-Annual Performance Report for Chromium and Perchlorate*.
2. TRX requested to submit the DVSRs for the Phase A data prior to the submittal of the Phase A report to expedite NDEP's review. NDEP concurs. The DVSRs are expected to be delivered to TRX during the 2nd week of May. TRX to submit the DVSRs via email if the size of the document is not too large. **ACTION ITEM**
3. TRX will submit an Addendum to the Phase A Work Plan outlining additional sampling to address the filtering versus not filtering of groundwater samples. The additional Phase A samples will be collected at the same time as the upcoming annual perchlorate sample effort. TRX to submit the Addendum to NDEP via email. **ACTION ITEM**
4. TRX to send an e-mail request to NDEP for an extension for the submittal of a groundwater capture evaluation work plan to coincide with the submittal of the quarterly report on May 25, 2007. **ACTION ITEM**
5. NDEP commented in the March 29th letter that Appendix A and C should include all wells and analytes with the Appendix A table being time limited and the Appendix C table being all inclusive. TRX proposed to include all wells in both Appendix A and C but to still limit the listed analytes in Appendix A to reflect the content and objectives of the report. Appendix C table will include the entire database. The NDEP concurred with this approach. TRX will propose a subset of analytes for the quarterly and annual reports in its response to comments. **ACTION ITEM**
6. TRX suggested submitting a template Figure for the Phase A data for preliminary review by NDEP. **ACTION ITEM**
7. TRX suggested submitting a list of Section descriptions for preliminary review by NDEP for the Phase A report organization. **ACTION ITEM**
8. NDEP noted that TRX may additionally submit figures, etc for preliminary review.
9. TRX asked about the status of the NDEP's review of the Phase I ESA for TRX Parcels. NDEP noted that the report is in review and a site walk needs to be completed. A parcel by parcel response has begun to be drafted. NDEP also noted that ownership needs to be established in regards to the parcel that BMI has proposed to add to the Phase I.

TRONOX

Susan Crowley
Staff Environmental Specialist

(702) 651-2234
fax (405) 302-4607
susan.crowley@tronox.com

April 10, 2007



Mr. Brian Rakvica, P.E.
Nevada Division of Environmental Protection
1771 East Flamingo Road, Suite 121-A
Las Vegas, Nevada 89119

Dear Mr. Rakvica:

Subject: Tronox LLC ECA Quarterly Report – First Quarter 2007

Pursuant to Section XIII of the Consent Agreement, signed September 5, 1996, between Nevada Division of Environmental Protection (NDEP) and Tronox LLC (Tronox), we submit the following quarterly status report for the Henderson facility's Environmental Conditions Assessment (ECA).

Activities Conducted, 01-01-07 to 03-31-07

Conceptual Site Model:
- CSM remains unchanged until additional data justifies revisions

Upgradient Investigation Results:
- March 23 – NDEP issues comments to Tronox

Phase A - Source Area Investigation
- January - March – Data analyses and validation are in process. Report preparations are underway. Tronox proposes to submit the Phase A Source Area Investigation Report by mid-year 2007. Further, Tronox proposes to develop a Workplan for the next phase of characterization work and include it as part of the Phase A Report submittal to NDEP.

QAPP and SOPs:
- January to March – Project-wide QAPP is in preparation, as well as Tronox-specific SOPs based on NDEP-approved BRC SOPs.

Community Involvement Plan
- March 14 – Tronox submits the Community Involvement Plan (CIP) to NDEP
- March 19 – NDEP issues comments to the Tronox CIP (NDEP requests responses by April 2, 2007).
- April 2 - Tronox responds to comments and submits a revised Community Involvement Plan (CIP) to NDEP.
- April 3 – NDEP approve the Tronox CIP

Other

- January 11 – Tronox submits to NDEP, the annual version of *Perchlorate Remediation – Updated 2006 Regional Maps and Plates*.
- January 15 – Tronox issued 4th Quarter ECA Status Report to NDEP.
- February 21 – NDEP convenes BMI partner companies in an 'All-Hands' Meeting in which Tronox makes a 90 minute presentation on the status of on-going site investigations and activities.
- February 26 – Tronox submits *Semi-Annual Performance Report for Chromium and Perchlorate; July – December 2006.*
- March 6 – All-company meeting convened via telephone conference to discuss various inter-site issues.
- March 29 – NDEP issues comments to the Tronox *Semi-Annual Performance Report for Chromium and Perchlorate July – December 2006.* (NDEP requests that responses be submitted by April 30, 2007).

Please note that the Tronox ECA *"Deliverable Schedule"* is attached. Feel free to call me at (702) 651-2234, if you have any questions. Thank you.

Sincerely,

Susan M. Crowley, CEM (exp 3-8-09)
Staff Environmental Specialist

Overnight Mail

Cc: See attached document distribution list

Attachment: ECA Deliverable Schedule

C:\SMC\My Documents\Document

Doc Distribution

C:\SMC\My Documents\Word Doc

Deliverable Schedule

Tronox Document Distribution List

Updated: 2-Apr-07

Document Name: ECA Quarterly Update

Name (Last, First)		Firm	Distribution		
			Hard	e-Copy	Cvr Only
Croft	Todd	NDEP	X		
King	Val	NDEP	X		
Najima	Jim	NDEP	X		
Harbour	Shannon	NDEP	X		
Sous	Nadir	NDEP			
Tinney	Al	NDEP	X		
Palm	Jon	NDEP	X		
Rakvica	Brian	NDEP	X		
Pohlmann	Brenda	COH	X		
Conaty	Barry	COH Counsel	X		
Durr	Paul	DAQEM			
Hunsaker	Ross	DAQEM			
Beckstead	Richard	DAQEM			
Jorgenson	Carolyn	DAQEM Counsel			
Mrowka	Rob	CCCP	X		
Mulroy	Pat	SNWA			
Goff	Mike	SNWA			
Liesing	Joe	SNWA			
Kaplan	Mitch	EPA, Reg 9	X		
Compliance Corrdonator		NDEP			
Compliance Coordinator		DAQEM			
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Bailey	Keith	Tronox	X		
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Reed	Tom	Tronox	X		
Hurst	Elizabeth	Tronox Counsel	X		
Stater	Rick	Tronox	X		
Crowley	Susan	Tronox	X		
Krish	Ed	ENSR	X		
Bilodeau	Sally	ENSR	X		
Gerry	Dave	ENSR	X		
Lambeth	Jeff	Veolia			
McDaniel	Tom	Veolia			
Cheung	Mary	Veolia			
Guerriero	Joe	AIG	X		
Giroux	Barry	GEI	X		
Stowers	Kirk	Broadbent ERM			
Sahu	Rahnijit	BMI	X		
Crouse	George	Syngenta	X		
Erickson	Lee	Stauffer	X		
Kelly	Joe	Montrose			
Sundberg	Paul	Montrose	X		
Gibson	Jeff	AmPac			
Sylvia	Chris	Pioneer	X		
Wilkinson	Craig	Timet	X		
Mack	Joel	Montrose Counsel			

ENVIRONMENTAL CONDITIONS ASSESSMENT - DELIVERABLE SCHEDULE
Tronox LLC - Henderson, Nevada
Revised: April 10, 2007

Deliverable	Date
Conceptual Site Model	Further revisions will be completed as needed following additional data collection activities
Source Area Evaluation (SAE) * Phase A Work Plan * Phase A - Source Area Investigation * Phase A - Source Area Investigation Report * Phase B – Work Plan * Phase B – Field Work * Risk Assessment	September 30, 2005 – Conceptual approach submitted. October 3, 2005 – NDEP approved conceptual approach October 21, 2005 – Workplan schedule submitted. February 28, 2006 - Workplan submitted October 2, 2006 – Revised Workplan Submitted November 1 to December 8, 2006 – Conducted field work. Mid-year 2007 Mid-year 2007 (to be incorporated with Phase A Report) Late 2007 Mid-year 2008
Upgradient Investigation (formerly termed the Background Study) * Background Study Workplan * Tronox Response to NDEP May 6, 2005 Comments * Tronox Response to NDEP July 28, 2005 Comments and Submits Upgradient Investigation Workplan (revised Background Study Workplan) * Upgradient Investigation Workplan Addendum * Upgradient Investigation Field Work * Upgradient Investigation Report * Tronox Response to NDEP March 23, 2007 Comments	 March 30, 2005 – Submitted July 22, 2005 – Submitted September 30, 2005 – Submitted October 4, 2005 errata sheets submitted February 28, 2006 – Submitted. March 13 – 24, 2006 – Conducted Field Work October 30, 2006 – Submitted to NDEP. TBD (2007)
Quality Assurance Project Plan and Standard Operating Procedures * NDEP provides comments on QAPP and SOPs	September 30, 2006 - Submitted Tronox response to comments pending
PERIODIC MONITORING AND REPORTING	
ECA Phase II Status Report (Quarterly)	January 15; April 15; July 15; October 15, 2007
Annual Perchlorate and Chromium Remediation Performance Report	August 26, 2007
Perchlorate Remediation Performance Data Submittal	May 25, 2007 and November 29, 2007

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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

April 3, 2007

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to:
Community Involvement Plan
dated April 2, 2007

Dear Ms. Crowley,

The NDEP has received and reviewed TRX's report identified above and finds that the document is acceptable.

If there are any questions please do not hesitate to contact me.

Sincerely,

Brian A. Rakvica, P.E.
Supervisor
Bureau of Corrective Actions
Special Projects Branch
NDEP-Las Vegas Office

CC: Jim Najima, NDEP, BCA, Carson City
Shannon Harbour, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Keith Bailey, Tronox, Inc, PO Box 268859, Oklahoma City, Oklahoma 73126-8859
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
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
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, CO 80402
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110

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STATE OF NEVADA
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DIVISION OF ENVIRONMENTAL PROTECTION

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

March 29, 2007

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to:
Semi-Annual Performance Report for Chromium and Perchlorate
dated February 26, 2007

Dear Ms. Crowley,

The NDEP has received and reviewed TRX's report identified above and provides comments in Attachment A. Please provide an annotated response-to-comments (RTC) letter **by April 30, 2007**. Additional Deliverables are defined below. These specific items should be submitted under separate cover. Once TRX has had an opportunity to review these comments it is likely that a conference call should be scheduled to discuss these issues.

If there are any questions please do not hesitate to contact me.

Sincerely,

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

CC: Jim Najima, NDEP, BCA, Carson City
Brian Rakvica, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Mike Richardson, NDEP, BWM, Las Vegas
Keith Bailey, Tronox, Inc, PO Box 268859, Oklahoma City, Oklahoma 73126-8859
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
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
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, CO 80402
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110
Dave Gratson, Neptune and Company, 1505 15th Street, Suite B, Los Alamos, NM 87544

Attachment A

1. Section 2.1 first paragraph last sentence, TRX states that the "dead zone" area between the slurry wall and recharge trenches contains groundwater that is "thought to be trapped and mostly stationary." Section 3.1.1 fourth paragraph and Section 4.1.1 first paragraph states that a decrease in the infiltration of Lake Mead water in the recharge trenches has allowed the "dead zone" water to slowly move downgradient. Section 2.1 should be modified to reflect the findings of sections 3.1.1 and 4.1.1.
2. Section 2.2 third paragraph, text should be clarified as it is unclear whether ART-5 also experienced the same increase in groundwater elevation as wells PC-55, PC-18, PC-17, and PC-12.
3. Section 2.3 paragraph three, text references wrong well; PC-117 should be PC-116R.
4. Section 3.1.1 and Section 4.1.1, the NDEP does not concur that hydraulic capture is being achieved by the onsite interceptor well field. Data from both the west and east sides on the slurry wall suggest that capture is incomplete. (See 15.a.i and 15.b.i for additional comments.) A groundwater capture evaluation work plan should be submitted **by April 30, 2007**. This item should be a Deliverable that is submitted under separate cover. Capture shall be evaluated as follows:

   The target capture zone for the system shall be refined to develop the three-dimensional target capture zone in accordance with the guidelines in Section C of *Elements for Effective Management of Operating Pump and Treat Systems, EPA 542-R-02-009, December 2002*. The development of the target capture zone must be discussed and resolved with the NDEP's Bureau of Corrective Actions. The lower boundary of the alluvial aquifer includes the saturated portion of the upper portion of the Muddy Creek Formation.

   The system must be able to demonstrate effective mass removal for contaminants passing through the target capture zone. This will be accomplished by evaluating the actual capture zone. The actual capture zone will be defined as the three-dimensional zone in which all ground water flow paths converge to the extraction points. At least three converging lines of evidence are required to prove the effectiveness of capture on a quarterly basis., Potential lines of evidence may include:

   - calculations of capture zone width based on flow budget and/or analytical models
   - demonstrating overlapping cones of depression by interpretation of groundwater flow lines from potentiometric surface maps and flow nets (for vertical capture demonstration) that are based on measured ground water elevations in the alluvial aquifer including the upper saturated portion of the Muddy Creek Formation or demonstration of overlapping cones of depression,
   - inward flow relative to compliance boundary based on measured ground water elevations at two or more locations oriented perpendicular to the boundary,
   - concentration trends over time at sentinel wells located downgradient of the capture zone,

- particle tracking in conjunction with a numerical ground water flow model calibrated/verified by actual ground water elevations under flow conditions, and
- implementation and analysis of data from tracer tests.

5. Section 3.1.2, provide a cross-section in the area of the single point anomaly along Sunset Road in the next semi-annual report. In addition, there is no control for defining the plume in this area. It is the belief of the NDEP that the plume is traveling to the east-northeast in this area (based upon a review of potentiometric surface maps). If existing wells are found to be suitable, they should be sampled. If wells do not exist, TRX should develop a work plan to address this data need.
6. Section 3.2, text does not match Figure 7 and the text is not clear regarding the origin of the 1 – 3 gal/min that is recycled to GW-11.
7. Section 4.1.2 second paragraph, the data provided in Table 7 does not support the claim made in this paragraph that there is a 97 pound per day difference at the Athens well field. The average monthly mass removed for the year before ART-9 became operational is approximately equal to the average monthly mass removed after ART-9 became operational. Please provide additional discussion and justification.
8. Section 4.1.3 second paragraph, if the pumping rate at the seep well field is being decreased and the hydraulic loading rate of the FBR system is still being reported at capacity, then provide discussion on where the additional hydraulic loading is originating.
9. Section 5.0 second and third paragraphs, the hydraulic and contaminant capture has not been demonstrated to the NDEP. (See comments 4, 15.a.i, and 15.b.i for additional information.)
10. Figures, the NDEP has the following comments and suggestions:
    a. Figure 2, the groundwater elevation for well I-K is shown lower than the screened interval and does not agree with the water elevation reported in Appendix A. This figure should be checked for accuracy and modified as necessary.
    b. Figure 3, the NDEP has following suggestions and comments:
        i. The groundwater elevations shown for several wells do not agree with the water elevations reported in Appendix A. This figure should be checked for accuracy and modified as necessary.
        ii. The perchlorate concentration for ART-5 is noted as being collected on November 3, 2006, however, no groundwater elevation is shown on the Figure.
        iii. All pumping well designations do not agree with Table 2 and this issue needs to be rectified.
        iv. According to Appendix A, "Pre-Pumping water level on April 30, 2002" was not collected in several wells. The figure should be modified to reflect this.
        v. The NDEP suggests that the historical and current perchlorate concentrations be combined at the top of the figure and historical and current chromium concentrations be shown at the bottom of the figure.

c. Figure 4, the NDEP has the following suggestions and comments:
   i. The NDEP requests that the vertical scale on this figure by exaggerated to improve readability and details shown are more obvious.
   ii. This figure should be checked for accuracy and modified as necessary.

d. Figure 5, the NDEP has the following comments:
   i. Note the significance of the dashed line on this figure.
   ii. Add the total chromium concentrations for wells I-G and I-T for November 2006 as the concentration data was presented in Appendix A.

e. Figure 6, the significance of the dashed line should be noted on this figure.

f. Figure 7, the NDEP has the following suggestions and comments:
   i. Add approximate flow rates from GWTP to BT-40 and BT-45, Lift Station #2 to Bioplant Equalization Area, Biological Treatment Plant to the Las Vegas Wash (if this is a bypass that is normally closed, a note should be added that discusses this; otherwise, please post the flow rate of water that is bypassed), and Bioplant Equalization Area to GW-11.
   ii. Label components that comprise the FBR system.
   iii. Label where samples are collected.
   iv. Remove description of system from GWTP, Bioplant Equalization Area, and Biological Treatment Plant blocks and move to a legend at the bottom of the figure.
   v. Update Biological Treatment Plant system description for 5 primary reactors.
   vi. The NDEP suggests that TRX consider labeling and referring to BT-40 and BT-45 as Storage Tanks to eliminate confusion with the Bioplant Equalization Area.
   vii. Figure 7 and the text in Section 3.2 do not agree. Modify text and/or figure as necessary.

g. Figure 9, the NDEP has the following comments:
   i. Note the significance of the dashed line on this figure.
   ii. Add the perchlorate concentrations for wells I-G and I-T for November 2006. The concentration data was presented in Appendix A.

h. Figure 11, the NDEP has the following comments:
   i. Note the significance of the dashed line on this figure.
   ii. Add the perchlorate concentration for well I-G for November 2006. The concentration data was presented in Appendix A.
   iii. The NDEP suggests using the same colors and markers for each time series in Figures 5, 9, and 11.

11. Tables, the NDEP has the following comments and suggestions:
   a. Table 2, add ART-6 to table and modify table to same format as Table 1. In general, notes or a legend would be helpful to define which wells are extraction wells and which wells are their co-located "buddy wells".
   b. Table 3, modify table to same format as Table 1 and clarify if PC-99R2/R3, PC-115R, and PC-116R are the same wells as PC-99, PC-115, and PC-116, respectively, in Appendix A. Modify Appendix A and/or the Tables as necessary.

c. Table 4, the NDEP notes that the total chromium inflow concentrations have generally been decreasing, however, the total chromium outflow concentrations have been increasing. Please explain and discuss this decreased removal efficiency. In addition, please provide a discussion and schedule for how TRX plans to mitigate this issue.
d. Tables 5, 6, and 8, modify Tables 5 and 6 to have the same format as Table 8.
e. The NDEP suggests that TRX create tables that list the date and elevation of the historic data used for drawdown calculation, the elevation data from the current sampling event, and the calculated drawdown for each well in each well field.

12. Plates, the NDEP has the following comments and suggestions:
    a. Plates 1, 5, and 6, in comparison to similar plates in the July 2006 Semi-Annual report, there seem to be many wells missing from these figures. These wells should be shown on Plates 1, 5, and 6.
    b. Plate 2, 3, and 4: has the overall groundwater elevation in each of these areas increased or decreased so that there is a significant impact to the calculated drawdown?
    c. Plate 3, explain how drawdown was calculated for several wells shown that do not have April 2002 elevation data listed in Appendix A.
    d. Plate 4, the NDEP does not fully concur with the drawdown contours presented by TRX. In general, TRX lacks sufficient control to present contours as solid lines to the northwest, north, and northeast of the ARP wells, to the east and southeast of PC-122, and to the south of ART-3, ART-4, and ART-8.
    e. Plate 5, the NDEP does not fully concur with the total chromium concentration contours presented by TRX. In general, TRX lacks sufficient control to present solid contours in several locations mainly to the east and west of the main body of the plume. Additionally, the NDEP does not believe that the total chromium concentration exhibited by PC-58 is an isolated detection; however, since groundwater elevation and contaminant concentration data were not provided for wells PC93/94, PC-1, and PC-2, the NDEP is unable to accurately make this determination. Therefore, TRX should provide groundwater elevation and analytical data for all wells associated with this site. (See comments 12.a, 13.a, 15.a.iv, and 17 for additional information.) In addition, this comment has been made previously to TRX, please refer to previous NDEP comments, For further clarification, also post the groundwater elevation and analytical data in this vicinity collected by BRC. If adjacent data cannot resolve this issue, perhaps a work plan should be developed to address this data gap. The connectivity of the hexavalent chromium plume with the Las Vegas Wash is an issue that should be resolved expeditiously.

13. Appendix A, the NDEP has the following comments:
    a. Add wells to this table so that all TRX wells are listed with their corresponding monitoring and analytical data as requested by the NDEP in a June 13, 2006 letter to TRX. (See comment 15.a.iv for additional information.)
    b. Based on the text of the report and Figure 3, the data listed in Appendix A for April 2002 appears to be mislabeled as May 2002.

c. Explain why no data for ART-5 was recorded for November 2006. Figure 3 indicates that a perchlorate sample was collected at ART-5 on November 3, 2006 and Plate 3 shows a calculated drawdown for ART-5.

d. Check the table for errors and modify as necessary. The NDEP noted that the groundwater elevation calculated for ART-8A and ART-9 were not correct.

14. Appendix B, the NDEP has the following comments and suggestions:
    a. General comment, to simplify review, TRX should consider setting one range for the groundwater elevation so that all graphs in Appendix B have the same groundwater range and scale. TRX should also consider setting two or three ranges for the total chromium concentrations so that each graph does not have a different concentration range and scale. This should be considered for the perchlorate concentration graphs as well.
    b. M-69(A) graphs, clarify whether this well should be M-69 or M-69A. Check all tables, graphs, and maps to make sure this well is consistently labeled.
    c. M-71 graphs, modify graphs to reduce the range of the groundwater elevation scale, which is currently too large to show any variation. Also, correct the data point for Mar 02.
15. Appendix D, the NDEP has the following comments and suggestions:
    a. TRX's Response to Comments on NDEP comment letter dated June 13, 2006.
        i. Response to Comment (RTC) 3, this report neither demonstrated hydraulic and chemical capture at each of the well fields nor demonstrated system removal efficiencies at each of the well fields. Hydraulic and contaminant transport modeling to demonstrate capture and removal efficiency should be submitted as noted above.
        ii. RTC 4, a proposal containing a list of key wells for quarterly, semi-annual, and annual sampling should be submitted by April 30, 2007. This Deliverable should be submitted under separate cover to the NDEP.
        iii. RTC 5.d, TRX states that they assume that the entire plume is hexavalent chromium in their response to comment 5.d and at a September 14, 2006 NDEP – TRX meeting yet in the text of the report (Section 3.1) TRX states that "between 10.8 and104.2 percent of the total chromium is hexavalent chromium." This discrepancy should be corrected in the text of the report. In addition, it is necessary to make this issue obvious on the Figures. Since TRX appears to have hexavalent chromium data for these wells, the NDEP requests that two Figures be submitted; one for total chromium and one for hexavalent chromium. Alternately, the total and hexavalent chromium data could be presented on the same figure. For example, "well XXX, total chromium concentration (hexavalent chromium concentration)."
        iv. RTC 8, the table presented in Appendix A needs to be updated as it does not contain all TRX wells. Please note that the table included in the quarterly/semi-annual reports may be time limited (e.g. the last five quarters of data) and that all analytes for any given well should be listed in the table, not just total chromium, perchlorate, and TDS. Additionally, the tables provided in the electronic version of the report do not include all wells, analytes, and historical data.

v. RTC 9, the NDEP has responded to the Upgradient Results Report comparison and evaluation of low flow sampling methods under separate cover.

b. TRX's Response to Comments on NDEP comment letter dated August 29, 2006.
   i. RTC 2, the NDEP does not concur that capture is being achieved of the eastern portion of the plume. Plate 1 does not show that there is sufficient well coverage east and northeast of the slurry wall to demonstrate hydraulic and/or chemical capture. Additionally, the perchlorate concentrations on Plate 6 illustrate that hydraulic capture is not complete to the east. If TIMET has wells located to the east and northeast of the slurry wall (e.g. CLD2R), TRX should include their locations, groundwater elevations, and analytical data on all maps of this area. To date, the NDEP has not received an e-mail from TRX proposing an approach to quantify capture as stated in TRX's response; therefore, TRX should submit their proposed approach for demonstrating hydraulic and chemical capture as noted above.
   ii. RTC 3, an evaluation of the interim remedial measure should be submitted by April 30, 2007.
   iii. Additionally, since TRX has stated that they assume the entire plume is hexavalent chromium and that the total chromium concentration equals the hexavalent chromium concentration, then contour lines for 0.01 mg/L and 0.005 mg/L should be added to the Total Chromium in Groundwater map.

16. Appendix E, the NDEP has the following comments:
   a. Future Reports. To facilitate review it is requested that future reports include a table that lists all applicable samples included in the Data Validation Summary Report (DVSR) along with their Sample Delivery group (SDG) ID, correspondence between Sample ID and sample location, the analyses conducted.
   b. Table E-3, Sample EB-2_08/03/06. The Table indicates the Chromium VI analysis for sample EB-2_08/03/06 was performed 28 days from sampling. The units are wrong; this should be 28 hours from the time of sampling.
   c. Hexavalent Chromium Holding Time. During this sampling period two analytical methods were utilized for hexavalent chromium analysis, EPA method 7196 and 218.6. During the year 2006 when this chromium study was conducted the holding time using either method for hexavalent chromium in water was 24 hours, as stated in the DVSR. However, recently the holding time for EPA method 218.6 (Rev 3.3) has been extended to 28 days if the sample is preserved at the time of collection or within 24 hours with the ammonium sulfate buffer solution specified in the method. This extended holding time only applies to EPA method 218.6 when the sample has been preserved with buffer within 24 hours of collection. Please clarify what was completed for these analyses.

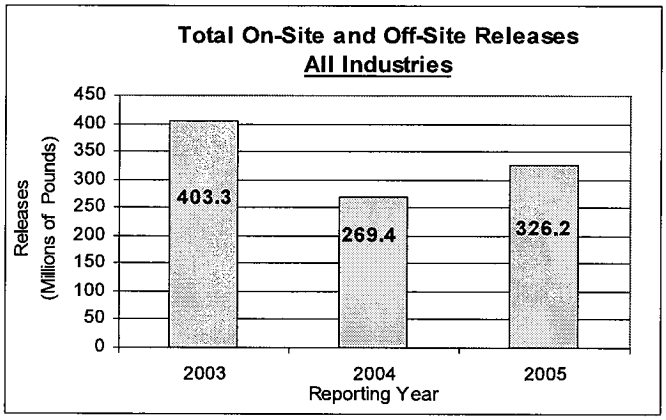
17. Electronically submitted data, per the September 14th meeting, TRX was to supply all parts of their database used for the development of the report. This information was not included.

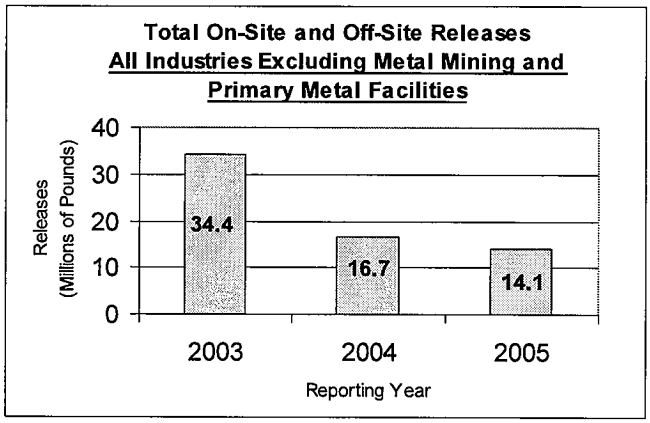
Nevada Report: 2005 Toxics Release Inventory

March 2007

U.S. EPA Region 9
Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations

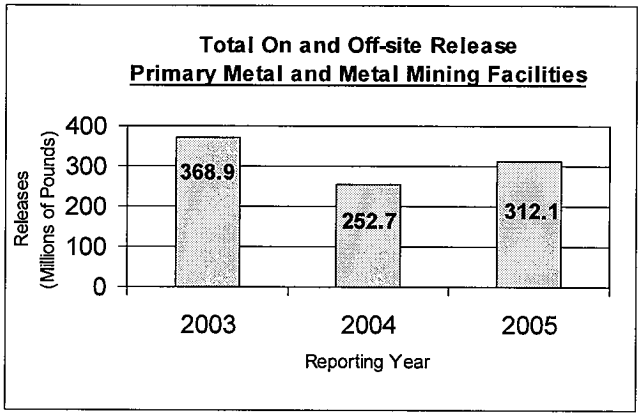
Trends in Toxic Chemical Releases for 2003 - 2005*





Total Releases for Reporting Years 2003-2005

Year	Air	Land	Under-ground Injection	Water	Off-Site
2003	1,841,845	400,650,496	2.8	102,551	708,687
2004	1,800,245	266,197,205	4.5	107,890	1,317,344
2005	1,979,411	322,793,943	6.0	110,556	1,329,232



The 2005 Public Data Release

EPA has made public the 2005 data on toxic chemicals that were released to Nevada's air, water and land. This information comes from the Toxics Release Inventory (TRI), a federal community right-to-know program. In Nevada, 133 facilities reported a total of 326.2 million pounds of toxic chemical releases.

Facilities that meet certain criteria must report the amounts of toxic chemicals disposed of or otherwise released on-site to air, water, land and injected underground and the amounts of chemicals transferred off-site for disposal or release. Off-site disposal or release can include land disposal at permitted hazardous waste facilities.**

The data does not indicate whether a facility is violating environmental laws. Many of the facilities reporting through this program are subject to state and federal regulations designed to protect human health and the environment. For instance, Resource Conservation and Recovery Act (RCRA) Subtitle C Landfills, a type of permitted hazardous waste fac

** Year to year data comparisons does not reflect changes in reporting requirements.*

*** No adjustments were made to account for double counting that could occur as a result of off-site transfers of some TRI facilities also being reported as on-site releases at permitted hazardous waste landfills and other TRI facilities that receive the on-site transfers.*

must comply with stringent requirements for liners, leak detection systems, and groundwater monitoring. Disposal in underground injection wells is regulated by EPA's Underground Injection Control Program to provide safeguards so that injection wells do not endanger current and future underground sources of drinking water.

Releases and Risk

Release is defined as the amount of a toxic chemical released on-site (to air, water, underground injection, landfills, and other land disposal), and the amount transferred off-site for disposal.

It is important to note that a release should not be directly equated with risk. To evaluate risk, release data must be combined with information about site-specific conditions, exposure, and chemical toxicity. TRI chemicals vary widely in toxicity. High volume releases of less toxic chemicals may pose less environmental risk than lower volume releases of highly toxic chemicals. Increases in on-site releases at permitted hazardous waste facilities may indicate a reduction in risk.

Industries

A facility is subject to TRI reporting requirements if it: has 10 or more full-time employees; is classified under a reportable Standard Industrial Classification (SIC) code; and manufactures, processes, or otherwise uses any of the listed toxic chemicals in amounts greater than the threshold quantities. For most chemicals (excluding Persistent, Bioaccumulative and Toxic (PBT) chemicals) the thresholds are 25,000 pounds for manufactured or processed and 10,000 pounds for otherwise used.

Manufacturing industries have been reporting their releases since 1987, and federal facilities started reporting in 1994. In 1998, an additional seven industry sectors began reporting their toxic chemical releases for the first time. These sectors are metal and coal mining, electricity generation, commercial hazardous waste treatment, solvent recovery, petroleum bulk terminals, and wholesale chemical distributors.

Nevada's Releases

Nevada industries as a whole reported an increase, from 2004 levels, total on-site and off-site releases increased by 21% a 56.8 million pound gain. Leading the trend was an increase of 56.6 million pounds in reported releases to land, a 21% change. The majority of the increases in on-site land disposal came from two Newmont Mining gold mines, Twin Creeks Mine and Carlin South Area Mine. Newmont Twin Creeks Mine increased its on-site land releases by 31.9 million pounds and Newmont Carlin South Area Mine reported a 30.4 million pound increase.

Many mines extract, move, store, process, and dispose of large amounts of waste rock and ore, materials which often contain low concentrations of naturally occurring metals. The vast majority of this material is placed in surface impoundments or on the land, and the metals are reported as on-site releases to land.

In the state of Nevada, metal mining and primary metal facilities account for 96% of all on-site and off-site releases and 97% of the on-site releases to land. Metal mining and primary metal facilities showed a 24% increase (59 million pounds) in land releases from 2004. Land releases from non-mining facilities decreased 20% or 2.9 million pounds. This was due in part to a 3.9 million pound decrease in releases from U.S. Ecology, a permitted hazardous disposal facility.

Overall, the state's air releases increased 179 thousand pounds or 10%. The rise in air releases can be attributed primarily to two facilities: R.R. Donnelley & Sons, a commercial printing facility and the Mohave Generating Station, electric services facility. R.R. Donnelley & Sons increased its air releases by 110 thousand pounds. The Mohave Generating Station raised its air releases by 54 thousand pounds from last year. Metal mining facilities saw a 1%, or 5 thousand pound, decrease in air releases from reporting year 2004.

There was a 3 thousand pound or 2% increase in water discharges. Newmont Mining Lone Tree Mine's gain of 2,680 pounds was the main cause for the increase in water releases. A large portion of this increase came from an increase in nitrate compound discharges.

The state experienced a minor increase in off-site releases. Off-site releases increased by approximately 1%, or 12 thousand pounds. The main contributor to the increase in off-site releases was, Tronox LLC, an industrial inorganic chemicals facility. This facility gained nearly 23 thousand pounds in off-site releases.

Persistent, Bioaccumulative, and Toxic Chemicals

In the year 2000, TRI was expanded to include additional Persistent Bioaccumulative and Toxic (PBT) chemicals and to require reporting for these chemicals at lower thresholds, ranging from 0.1 grams to 100 pounds. PBT pollutants are toxic chemicals that persist in the environment and bioaccumulate in food chains, posing risks to human health and ecosystems.

In Nevada, nearly 90 million pounds of total on-site and off-site releases of PBT chemicals were reported. There was a 18% (19.8 million pounds) decrease in PBT releases. This change was driven by the decrease in lead and lead compound releases.

Table of PBT Chemical Releases in Nevada

Releases of Persistent, Bioaccumulative and Toxic (PBT) chemicals in pounds. Dioxin and dioxin-like compounds data not in Toxicity Equivalence (TEQ).

	Total On- and Off-Site Releases		Percent Change
Chemical Name	2004	2005	
Lead and Lead Compounds (in pounds)	105,780,859	86,381,236	- 18%
Mercury and Mercury Compounds (in pounds)	3,943,459	3,573,624	- 9.4%
Polychlorinated Biphenyls (PCBs) (in pounds)	26,917	10,970	- 59%
Hexachlorobenzene (in pounds)	2,587	4,093	58%
Trifluralin (in pounds)	3,212	3,252	1%
Chlordane (in pounds)	399	493	24%
Polycyclic Aromatic Compounds (PACs) (in pounds)	175	200	14%
Heptachlor (in pounds)	162	122	- 25%
Benzo(g,h,i)perylene (in pounds)	1.18	1.38	17%
Dioxin and Dioxin-like Compounds (in grams)	9.84	10.36	5.3%

In determining release quantities for metal compounds, facilities only consider the primary metal portion of the compound. For instance, a facility reporting for lead compounds only reports the lead portion of the lead compounds released. Hence, the table above gives combined values for lead and lead compound releases and mercury and mercury compound releases. The PBT chemicals are ranked by 2005 total releases. The data is in pounds for all chemicals except dioxin and dioxin compounds, which is in grams.

Lead and Lead Compounds

Starting in the year 2001, lead and lead compounds were reported as Persistent Bioaccumulative and Toxic (PBT) chemicals. While lead and lead compounds have been on the list of reportable chemicals since 1987, for the year 2001 the reporting threshold was drastically lowered (from 25,000 pounds manufactured or processed, and 10,000 pounds otherwise used to 100 pounds manufactured, processed or other wise used). As a result, additional facilities are required to report releases of lead and lead compounds.

Approximately 86.3 million pounds of total releases of lead was reported in Nevada. Fifty-five percent of these releases were land releases from silver ore metal mining industries. The 19 million pound reduction in lead was driven by a 37.6 million pound decrease of land releases at one silver mine, Coeur Rochester Inc.

There was also a 3 thousand pound (32%) decrease in lead air releases. The facility with the largest decrease (1,910 pounds) in air releases was Coeur Rochester. The U.S. Department of Energy Sandia National Laboratories / Nevada, a government research facility, had the second largest decrease in air releases (1,790 pounds). Sandia reported 0 pounds of lead released in the air for 2005.

Mercury and Mercury Compounds

The reported 9% (370 thousand pounds) decrease in mercury and mercury compounds was driven by decreases of on-site land releases at two gold mines, Barrick Goldstrike and Newmont Carlin South Area. Barrick Goldstrike reported a 281 thousand pound

reduction in on-site land mercury releases and Newmont Carlin South Area reported a 126 thousand pound decrease in on-site land mercury releases. Mercury air releases decreased by 5% (246 pounds). Two gold mines reported the largest decreases in mercury air releases. Barrick Goldstrike reported a 504 pound decrease in mercury air releases and the Cortez Gold Mines reported a 491 pound decrease in mercury air releases.

Polychlorinated Biphenyls (PCBs)

Releases of PCBs decreased nearly 16 thousand pounds from 2004. Nearly all of the PCB releases in 2005 were on-site land releases in a RCRA Subtitle C Landfill at US Ecology Nevada Inc., in Beatty.

Facilities Releasing Largest Quantities of Chemicals

The top ten facilities in Nevada for total on-site and off-site releases of all chemicals are:

1. Newmont Mining Corp Twin Creeks Mine (Golconda, Humboldt County) with 80.9 million pounds.
2. Newmont Mining Corp Carlin South Area (Carlin, Eureka County) with 60.4 million pounds.
3. Barrick Goldstrike Mines Inc (Elko, Elko County) with 49.1 million pounds.
4. Coeur Rochester Inc (Lovelock, Pershing County) with 47.7 million pounds.
5. Newmont Mining Corp Lone Tree Mine (Valmy, Humboldt County) with 26.5 million pounds.
6. Robinson Nevada Mining Co (Ruth, White Pine County) with 20.6 million pounds.
7. Newmont Mining Corp Mule Canyon Mine (Battle Mountain, Lander County) with 16.0 million pounds.
8. US Ecology Nevada Inc. (Beatty, Nye County) with 7.3 million pounds.
9. Cortez Gold Mines (Crescent Valley, Lander County) with 3.1 million pounds.
10. Jerritt Canyon Mine (Elko, Elko County) with 2.6 million pounds.

The top ten facilities in Nevada for total on-site and off-site releases of PBT chemicals are:

1. Coeur Rochester Inc (Lovelock, Pershing County) with 47.7 million pounds.
2. Robinson Nevada Mining Co (Ruth, White Pine County) with 20.2 million pounds.
3. Barrick Goldstrike Mines Inc (Elko, Elko County) with 7.7 million pounds.
4. Newmont Mining Corp Carlin South Area (Carlin, Eureka County) with 5.1 million pounds.
5. Cortez Gold Mines (Crescent Valley, Lander County) with 2.5 million pounds.
6. Newmont Minning Corp Twin Creeks Mine (Golconda, Humboldt County) with 2.3 million pounds.
7. Glamis Marigold Mine (Valmy, Humboldt County) with 1.1 million pounds.
8. Newmont Mining Corp Lone Tree Mine (Valmy, Humboldt County) with 805 thousand pounds.
9. Bald Mountain Mine (Elko, White Pine County) with 716 thousand pounds.
10. Smoky Valley Common Operation (Round Mountain, Nye County) with 583 thousand pounds

On-line Access

For national information on data releases, see:
http://www.epa.gov/tri

The TRI data is available through Envirofacts Warehouse, EPA's premier internet site for distributing environmental information at:
http://www.epa.gov/enviro

or the TRI Explorer tool:
http://www.epa.gov/triexplorer

For general information on the Toxics Release Inventory, including reporting requirements for businesses, go to:
http://www.epa.gov/region09/toxic/tri

For more information on the EPA's PBT Chemicals Program, go to:
http://www.epa.gov/opptintr/pbt/

Information and Assistance

Region 9 staff will answer questions and assist you in learning more about the TRI Program in Region 9.

U.S. EPA Region 9, TRI Program
Nancy Sockabasin, (415) 972-3772
Mariela Lopez, (415) 972-3771

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

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

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

March 23, 2007

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to:
Upgradient Investigation Results
dated October 30, 2006

Dear Ms. Crowley,

The NDEP has received and reviewed Tronox's report identified above and provides comments in Attachment A. Once TRX has reviewed these comments it may be useful to have the NDEP's technical team discuss these matters with the TRX technical team. Please advise when a revised report can be expected.

If there are any questions please do not hesitate to contact me.

Sincerely,

Brian A. Rakvica, P.E.
Supervisor, Bureau of Corrective Actions
Special Projects Branch
NDEP-Las Vegas Office

CC: Jim Najima, NDEP, BCA, Carson City
Shannon Harbour, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
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
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, Co 80402
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110
Paul Black, Neptune and Company, Inc., 8550 West 14th Street, Suite 100, Lakewood, CO 80215
Paul Duffy, Neptune and Company, Inc., 8550 West 14th Street, Suite 100, Lakewood, CO 80215

Attachment A

1. General comment, the NDEP provides the following general comments:
    a. There is inconsistency in the report with respect to the subject-verb agreement for the usage of the word "data". In some places it is treated as singular and in others it is treated (correctly) as a plural.
    b. When statistical tests are performed, it is preferable to present the *p*-values that correspond to the test as opposed to a binary indicator of whether the null hypothesis was rejected or not. Because the *p*-value quantifies the weight of evidence against the null hypothesis, the actual value is useful when hypothesis tests are used as part of the decision-making process, as opposed to the sole determinant of the decision-making process itself.
    c. Regarding data usability, it would be helpful if TRX followed the recent example from the BRC Borrow Pit Human Health Risk Assessment for the revised version of the Upgradient Report. Please note that the revised version of the BRC Borrow Pit Human Health Risk Assessment has not been published as of the date of this letter. In addition, the NDEP would be happy to review this issue with TRX. The TRX data usability is currently incomplete.
    d. The evaluation of Data Quality Indicators is also incomplete. In particular, comparability and representativeness are insufficiently addressed.
    e. Too much reliance is placed on statistical test results, and not enough on the weight of evidence. Summary statistics and exploratory data analysis are presented, but the statistical test results dominate conclusions. They should be considered in light of the plots and summary statistics, so that informed decisions are made. This approach might shed some light on why some of the statistical results are significant and others are not. Exploration and interpretation are key, and cannot be replaced by a flowchart approach to performing statistics in a vacuum. The data can tell a story; the data analysis should expose that story. In general, this is a case where it would be helpful if some more analysis and interpretation was given. Why do some of these tests fail? Which boreholes cause the failure? Is it because they have relatively high or low concentrations? Why are depth differences seen when geological differences are not? Why are depth and geologic differences both seen for some chemicals. It is important to use the data to understand what is going on, and not simply report statistical analysis results. It is not enough to simply state that statistical tests fail or do not fail. This is a general comment that applies to all of the analyses reported.
    f. In addition, the pieces should be used to build a picture of what is happening and then there should be a report on the big picture as well. However, the presentation of results is at the level of each chemical, without building a case for what these results mean collectively. For example, there are differences between the TRX and the City of Henderson (COH) and BMI/TIMET background. This would imply that

the background distributions are different, or that there are releases impacting the site. If the latter, then it is probably inappropriate to combine data for any of the chemicals considered. This analysis is at a detail level that does not help understand what is going on at the site. The bigger picture needs to be pulled together from the pieces.

2. Table of Contents, the page numbers in the table of contents appear to be incorrect.
3. Acronyms, page iv, ANOVA typically refers to general "analysis of variance" models and not just the "one-way analysis of variance" as stated on page vi.
4. Executive Summary, the NDEP has the following comments:
    a. Page ES-1, second paragraph, first sentence states, "The upgradient investigation successfully achieved the objective of gathering sufficient soil and groundwater chemistry data to characterize the local upgradient geochemistry of the sediments in the different upgradient formations as well as to characterize the groundwater that moves through the formations." Some description of sufficiency should be presented here.
    b. Page ES-1, 1st para after the bullets, last sentence. The sentence implies the existence of groundwater background data. The sentence should be revised to make it clear that background comparisons with the COH and BMI data are only applicable to soil data. The groundwater data have not been compared to other background data.
    c. Page ES-1, 2nd paragraph after the bullets, 2nd sentence, it is not clear why this RPD objective was used. This has no statistical basis for determining the importance of differences that are observed. See other comments below on the comparison of micro-purge and bailer results.
    d. Page ES-2, TRX states "Statistical comparisons between the Tronox and COH data sets indicate that all species, except arsenic and iron, represent different populations and should not be combined for subsequent analyses." Please note that the NDEP does not necessarily concur and believes that this issue should be discussed amongst statistical personnel.
    e. Page ES-2, TRX goes on to state "This is not surprising because the COH data were collected from alluvial materials approximately 2.4 to 3.4 miles to the east of the upgradient samples." Please note that the 2.4 to 3.4 mile distance has little to do with the comparability of these samples. This issue should be discussed in terms of geochemical similarities.
    f. Page ES-2, TRX goes on to discuss the BRC/TIMET data set in a similar manner as above. Again, the NDEP believes that this issue warrants further discussion between statistical personnel.
    g. Page ES-2, 1st full paragraph, 3rd sentence. It is not clear how samples were qualified based on "representativeness". This is a qualitative issue that refers to how the samples collected represent the populations they are meant to represent. Some clarification (or deletion) would help.
    h. Page ES-2, second full paragraph, second sentence states, "The upgradient data for metals and perchlorate in soil samples were statistically compared boring to boring, depth-to-depth (20 ft or less vs. 30 ft or more), and alluvium to Muddy Creek formations." It is not clear what this means.

Perhaps the sentence could be broken into bullets that describes each set of comparisons.

i. Page ES-2, 3rd full paragraph. This and the next paragraph indicate that some of the populations are different. It is important to know more about what this means. Are the TRX concentrations greater than or less than the background concentrations in these cases? Are the differences large or small (statistical but not practical perhaps)? This gets at the general concern that too much reliance is placed on statistical test results, and that more attention should be paid to interpreting the data from summary statistics, plots and test results (including professional judgement).

j. Page ES-2, 5th full paragraph. Similar concerns about the level of interpretation provided for the statistical results that have been presented. Its also not clear if the goal here is to merge datasets, or simply to note whether the TRX and background datasets are similar or not. The background data set is quite rich at this point, so inclusion of new data in the background dataset may not be needed. In addition, since several metals and radionculides do not exhibit site concentrations that are similar to the background data, this begs the question of the reasonableness of combining any of those data. The goal instead should be comparison of the TRX data with the background data, not with a view to combination of the data for some chemicals.

k. Page ES-3, 1st full paragraph. Perchlorate is detected again below 50 feet. It would be helpful if some indication of concentrations were provided.

l. Page ES-3, 1st full paragraph. A depth is not provided for the term "shallow groundwater". It would be helpful to know the depth of the shallow groundwater here.

m. Page ES-3, 2nd full paragraph. In the context of the Executive Summary, it is not clear why a paragraph is devoted to perchlorate. Some explanation is needed for why perchlorate is called out when this is not the case for any other chemicals (except Cr).

n. Page ES-3, 2nd full paragraph. In the context of the Executive Summary, it is not clear why a paragraph is devoted to Cr. Some explanation is needed for why Cr is called out when this is not the case for any other chemicals.

5. Section 1.2.3, page 1-4, TRX states "At the request of the NDEP, soil from one boring (M-120) was analyzed for the full list of SRCs." Please revise this statement as this was never requested by the NDEP. If TRX believes that the NDEP is in error, please provide the documentation to support the above statement.
6. Section 1.2.3, page 1-4, bullets at top of page. It might be helpful to present these items on a Figure.
7. Section 1.2.3, page 1-4, last paragraph of Section 1.2.3. The borings are shown on Figure 1-2 rather than Figure 1-1.
8. Section 2.5.2, page 2-4, please note that the background summary report is currently being revised in response to NDEP comments.
9. Section 2.5.3, page 2-5, TRX refers to the NDEP's consultant as "Neptune Company". Please note that the proper company name is "Neptune and Company, Inc.".

10. Section 2.5.3, 2nd paragraph, suggest rewording the back end of sentence that states "however, the elimination of these rejected data did not adversely affect the data set statistics used in this study. It is not clear what "data set statistics" means. Perhaps the term "statistical analyses" or "data analyses" would be more appropriate.
11. Section 2.5.3, 4th paragraph, last sentence. Suggest changing "comparable" to "similar" but in the context of the distributions of the concentrations. One problem with the term comparable here is that EPA uses that term for a different purpose as one of its Data Quality Indicators.
12. Section 2.5.3, 4th paragraph, 1st sentence. Sentence does not make sense as written. It includes a clause that background data for the River range were collected because the northern McCullough range is the primary source of material… Suggest rewriting the sentence.
13. Section 2.5.3, 5th paragraph, 1st sentence. Replace test with tests at the end of the sentence.
14. Section 2.5.3, page 2-6, 1st paragraph, last sentence. It is not clear that this sentence makes sense. It is not clear what is meant by the "BRC/TIMET data set incorporates the variability of the COH data set". Perhaps this should be explained in terms of the range of the data, but variability usually means variance or standard deviation, in which case the sentence does not make sense. Some clarification is needed.
15. Section 3. It appears that the data usability step has been missed. Data validation has been performed, data evaluation has been performed, but the intermediate step as part of EPA's quality system has not been performed. See also general comment above.
16. Section 3.1, page 3-1, TRX states "The boreholes were backfilled with the unused core material". Please note that this practice is forbidden by the Nevada Division of Water Resources and should not be repeated in the future. Please note that this comment applies to similar instances discussed in other sections of the report.
17. Section 3.1, page 3-1, TRX states that a Photovac PID was used. Please discuss the bulb that was used in this PID and how this bulb relates to the ionization potential of the chemicals that were being investigated.
18. Section 3.5, page 3-5, please clarify if the wells were sampled with the bailer or micro-purge technique first. Also, please discuss the time that elapsed between each event. In addition, please discuss the amount of time that elapsed between the installation of the micro-purge well and the sampling event.
19. Section 3.12, NDEP has the following comments:
    a. Page 3-10, second to last paragraph states, "When more than two sets of data were compared, such as when the concentrations of more than two soil borings were compared, the ANOVA and the Kruskal-Wallis tests were applied." It isn't clear to NDEP that this comparison makes sense. Is this approach looking for differences between boreholes? If so, some further explanation of why this is potentially useful is needed. Is the intent to search for spatial differences in the data, so it is basically an effort at exploratory data analysis. In addition, a downside of running as many tests as have been run on the same data is that the error rate being used of 0.05 is no longer supportable.
    b. Page 3-10. The Gehan test is a generalization of the Wilcoxon Rank Sum test. That is, if there are no censored data (non-detects) then they give

exactly the same results. All that the Gehan test does that is different is provide a different ranking system for the data when non-detects are involved. Otherwise the statistical tests (Gehan and WRS) are the same. This issue seems to be missed in the presentation and in the report.

c. Page 3-10. The value of running a t-test on log-transformed data is not totally clear. Log-transformations essentially smooth the data, especially lessening the effect of higher values. Consequently, running a test that says that the mean of the logs are similar (or not) is not conceptually appealing. EPA, in its Data Quality Assessment guidance (2006) does not require testing on transformed data, but instead suggests using non-parametric tests when the normality assumptions are sufficiently violated. We would prefer that TRX performs t-tests on the untransformed data, and the WRS test (along with the Quantile and Slippage tests – see below), when comparing two sets of data, especially when one set is meant to be background. This set of tests has been long approved by EPA, and are customarily run when comparison is needed between two sets of environmental data, especially when one of the sets is a background or reference set.

d. Page 3-10, last paragraph. The NDEP does not concur with the reasons given for not running the Quantile and Slippage tests. The objectives of the statistical analysis are, in general, to determine of different sets of data (distributions of concentrations) are similar. The reason that Gilbert introduced the Quantile and Slippage tests for environmental data was precisely because it is not unusual to see differences in the tails of such distributions, when the centers are similar. Background comparisons, among other comparisons, have been performed here, and use of these tail tests is relevant and should not be dismissed without some better justification.

20. Section 3.13.1, pages 3-11 through 3-12, it is not clear to the NDEP why TRX has included an extended discussion of the data validation process in this section. NDEP and TRX have mutually agreed to a process and this should not be repeated in the revised report. This process should be summarized via a reference to the documentation between NDEP and TRX.
21. Section 3.13.2, the NDEP has the following comments:
    a. Page 3-12, Section 3.13.2, 2nd bullet. It is noted that only a small number of radionuclide analyses were performed. Is this regarded as a data gap? Or, do more such data need to be collected to support hypothetical DQOs or data needs and requirements? We also note that the last sentence states, "(the comparisons for radionuclides was limited because only a small number of radionuclide analyses were conducted below the Quaternary Alluvium)." The word "was" should be changed to "were".
    b. Page 3-12, Section 3.13.2, 3rd bullet. Background comparisons will be performed, but it is not clear that there is justification in combining TRX and background data sets. See earlier comments. It would be up to NDEP to decide if the background dataset should be augmented, but the arguments provided are not sufficient to justify this as a goal or objective.

Background comparisons can be performed, but the purpose should be to determine if the TRX data are similar to background.

c. Page 3-12, paragraph after bullets. It is questionable that averaging field duplicates is standard statistical procedure. Field duplicates for soil samples often should be represented as separate samples, depending perhaps on the nature of the contamination. Most metals are sufficiently particulate that field duplicates serve very little purpose for QA because they do not account for small scale variability. If the duplicates are splits (splits of a homogenized sample), then there is some QA value in their collection. A further problem is that averaging violates some basic statistical assumptions. We agree that averaging is done, but and that the assumptions violation (of independent and identically distributed assumptions) is ignored. The preference these days is to treat them as separate samples unless there is any reason not to (e.g., because they are splits). Otherwise averaging is accepted. Other options include using the first sample because the second one was collected for a different reason. From the perspective of classical statistics this is also justifiable. There is an example in EPA's Data Quality Assessment guidance (G-9, 2006) that addresses this issue, and treats the field duplicates as separate samples. Also, when it should be stated how the detection status is determined for duplicates when one of the duplicates is detected and the other is not (e.g. Sb:sample id M117-20, perchlorate M118-20)

d. Page 3-12, 2nd last paragraph. The boxplots for the "all results" for each chemical are not particularly useful. There might be better choices for showing distributions like this, such as histograms, or density estimates, but the main purpose of this data analysis is comparison, for which the side-by-side boxplots are helpful.

e. Page 3-13, second paragraph, middle. It is stated that, for reasons given, the "average arsenic concentration .... is an approximation of the true mean". This is not a correct statistical statement. Despite the fact that many statisticians do not believe in the concept of a "true mean", the average is not an approximation, it is an estimate of the "true mean".

f. Page 3-13, second paragraph, last sentence states, "Instead, statistical tests can be applied to determine with reasonable confidence if the measured concentrations came from two separate formations, even if the mean arsenic concentrations are the same or similar." The phrase "are the same or" should be omitted. If the measured concentrations from two formations are the same than there can be no statistical difference between the two.

g. Page 3-13, 3rd paragraph, third sentence states, "An appropriate statistical test could be conducted to determine the probability that the null hypothesis is true." This is technically incorrect. Statistical hypothesis tests do not compute the probability that the null hypothesis is true. Hypothesis tests are performed to determine the probability of observing a result (this result is based on the statistic of interest, and the way the data are summarized with respect to the statistic of interest) outside of the

expected range of results that would be obtained when assuming that the null hypothesis is true. Basically, we assume the null hypothesis is true and then see how incongruous the data are with respect to that assumption. Perhaps the following statement could be used as a replacement: "An appropriate statistical test could be conducted to determine whether the null hypothesis should be rejected."

h. Page 3-13, fourth paragraph, last sentence states, "In contrast, nonparametric tests can be applied to any dataset regardless of the distributions." There are some distributional requirements for some non-parametric tests. For example, the Wilcoxon class of tests does technically require that the distribution be symmetric about a median. In general, non-parametric tests do not require that the distribution follow a form that can be parametrized (e.g. normal, gamma, etc).

i. Page 3-13, last paragraph, first sentence states, "If both subsets of data were assumed to follow normal distributions, the parametric F-test was conducted to evaluate if the standard deviations are equal." The F-test is performed using the variance and tests for the equality of variances. Even though the standard deviation is a function of the variance, since the test is performed on the variance, the results of the test should be interpreted in terms of the variance. An analog is that equality of the means does not imply equality of the logarithm of the means. This correction should be made in subsequent sentences as well. Additionally, it isn't clear if this test was one-sided or two-sided. This should be stated.

j. Page 3-14, first paragraph, first sentence states, "Differences among borings were evaluated using a parametric ANOVA to test the null hypothesis that the mean concentrations from all of the borings are the same and using a non-parametric Kruskal-Wallis test to test the null hypothesis that the median concentrations from all of the borings are the same." It isn't clear that this is an appropriate use of the ANOVA model. If a regular ANOVA model is run (i.e. fixed effects) then the interpretation is valid for only those borings where samples were taken. If, however, a random effects model were run, then this approach would allow for inferences among the collection of all possible boreholes.

22. Section 4.2 subsections. Please explain why comparisons have been performed with PRGs for some of the suites of chemicals and not for others.
23. Section 4.2.6, page 4-3, "Uranium (natural)" should be changed to "Uranium (elemental)."
24. Section 4.2.6, page 4-4, the summary of the radionuclide analysis presented here is fine. However, no backup is provided. These results need to be justified with the calculations that were performed. The calculations should involve some statistical analysis to demonstrate the similarities that are reported.
25. Section 4.3, page 4-5, first sentence. It is not clear that the data can lead to a conclusion about which approach leads to more representative samples. The data can lead to a conclusion that the two methods yield different results. Then a conclusion can perhaps be drawn that the micro-purge method produces more representative data, but only because there is a difference and it is believed that the micro-purge

approach is likely to give better data. That is the conclusion is based on what is expected, and then supported by the data, and not purely on the statistical evaluation. The statistics can only indicate if there is a difference.

26. Section 4.3, page 4-6, it is not clear why RPD was used for this comparison. This limits the comparison to a pair of data points at a time, does not adequately account for the direction of the differences, and the RPD provides no statistical basis for drawing conclusions. It is more appropriate, statistically, to perform a paired *t*-test (or non-parametric analog) on the paired data.
27. Section 4.3, page 4-6, paragraph in middle of page. It is stated that: "An RPD greater than 30% represents a statistically significant difference in duplicate water samples". This statement is not correct. There is no statistical significance associated with the RPD measure.
28. Section 4.5, general comment, please explain what it means that the intent is to examine potential issues related to matrix interferences? How is this done? What statistical methods are used? Is it based purely on chemistry data validation? These samples are hoped to be close to background, hence relatively unimpacted, so what is expected here? It is not clear how analysis of samples that probably will not have high concentrations of these chemicals will help when analyzing samples that have high concentrations of these analytes.
29. Section 4.5.1, the NDEP has the following comments:
    a. Page 4-7, 1st paragraph, 3rd sentence. This sentence requires some cleanup. Otherwise it seems as though silica was measured in 45 samples. Use of semi-colons to separate items might help.
    b. Page 4-7, 1st paragraph, 4th sentence. The way the sentence is worded makes it seem as though perchlorate is a metal. Perhaps the sentence can be reworded.
    c. Page 4-7, second paragraph, first sentence states "Box and whisker plots of the data for each metal and for perchlorate in the soil samples are presented in Figure 4-7." The legend in figure 4-7 states that the whiskers of the boxplot extend to the minimum and maximum value. This is incorrect. The third to last sentence in this paragraph correctly states "The whiskers extend to the largest and smallest values that are not more then 1.5 times the IQR range above or below the box." The same changes need to be made to the legends in Figures 4-8 through 4-15.
    d. Page 4-7, second paragraph, last sentence. Note that the box plots as presented show the mean concentration as well.
    e. Page 4-8, first sentence states, "Box and whisker plots for metals and perchlorate grouped by boring are presented in Figure 4-8." It isn't clear how or when multiple samples were collected from within each borehole. Please clarify if these samples from multiple depths within the same borehole.
    f. Page 4-8, 1st paragraph, in looking at some of the plots, some of the ANOVA results are "unexpected". This is a case where it would be helpful if some more analysis and interpretation was given. Why do some of these tests fail? Which boreholes cause the failure? Is it because they have relatively high or low concentrations? It is not enough to simply

state that statistical tests fail or do not fail. This is a general comment that applies to all of the analyses reported.

g. Page 4-8, second paragraph, first sentence states, "Box and whisker plots grouped by sample depth are presented in Figure 4-9." Why is only a subset of the analytes presented in Figure 4-9?

h. Page 4-8, second paragraph, last sentence states, "Based on the apparent differences in concentrations between these two depths, statistical tests were conducted to compare subsets of the data in these two depth ranges." There should be a reference to the table where the results of these statistical tests are presented. Additionally, is there a physical reason that these differences between data greater than 20ft and less than 20ft exist? It isn't clear that dividing the data based on observed differences and then running statistical tests to quantify these differences makes sense in the absence of a physical reason for differences that can be incorporated into the conceptual model.

i. Page 4-8, 3rd paragraph, if only 3 samples were collected from the fine-grained facies, did TRX also consider removing them from the analysis? Please consider if it would make any practical difference in the statistical results.

j. Page 4-8, bullets. This separation is curious. The separation by depth needs to compared to the separation by geology. That is, perhaps when both distinctions occur they are for the same basic reason. This should be investigated further in an attempt to simplify this process of separating data sets. When there are statistical differences in one case and not the other, is it because the difference is marginal statistically. Presumably the data are being split similarly for these 2 cases (depth and geology), at least there must be overlap, in which case it is worth exploring the data further to understand what the results of the statistical analyses are trying to say.

k. Page 4-8, fifth paragraph, first sentence states, "Differences were statistically significant by depth range but not by geological formation for two chemicals: tungsten, vanadium, and perchlorate." Tungsten should be removed.

l. Page 4-8, last bullet on the page states, "If differences were statistically significant by both depth range and geological formation, preference was given to the categorization (i.e., by depth range or by geological formation) that resulted in subsets of the data that followed either normal or lognormal distributions. This selection was made to provide subsets of the data that could be used in parametric statistical tests for future comparisons. If both categorizations led to subsets that followed normal or lognormal distributions, the data were categorized by geological formation. Similarly, if neither categorization led to subsets that followed normal or lognormal distributions, the data were also categorized by geological formation." The decision process for partitioning should account for a conceptual understanding of the site as opposed to convenience for statistical testing. For example, differences as a function of both depth and geology are not surprising since geology is a function of

depth. The existence of normal distributions for both subsets of data defined as a function of geology, provides some evidence that the differences are due to geology as opposed to anthropogenic contamination that is diluting as a function of depth and hydrogeology (e.g. perchlorate). However, the existence of normal distributions for both subsets of the arsenic and potassium data defined as a function of depth suggests that something is missing from the conceptual model. For example, is 20 ft the vertical extent of groundwater rise during anomalous precipitation events? Additionally, it seems odd that so many analytes have lognormal distributions for both subsets of the data defined as a function of depth (e.g. barium, chromium cobalt, magnesium, uranium, and vanadium).

m. Page 4-9, "Upgradient Data vs. Background Data" section. There should be some brief review of the relevant aspects of the COH and BRC/TIMET datasets here. Specifically, what are the depths for the COH and BRC/TIMET datasets and why is it meaningful to compare the TRX data to the COH and BRC/TIMET datasets?

n. Page 4-9, Section 4.5.1. Given the results that for many chemicals there are statistical differences between geologies or depths, and between TRX data and background, it is more reasonable, in a bigger picture sense, to conclude that TRX and background data sets should not be merged. It would be very difficult to justify merging for some chemicals and not others, when the differences that exist can be due to releases as well as to geology differences. If there are any releases in this area, then background conditions as a whole do not exist, and combination of TRX and background data sets may not make sense.

o. Please discuss if TRX considered comparing the upgradient data only to the McCullough Mountains data set from the BRC/TIMET/COH data set.

30. Section 4.5.2, page 4-9, earlier it was indicated that the radionuclides are in secular equilibrium. However, in this section some radionuclides are considered greater than background and others are not. Are there any further observations that can be made to clarify the interplay between the background comparisons and secular equilibrium?

31. Section 5.0, the NDEP has the following comments:

    a. Page 5-1, Data Validation section, reference is made to data quality indicators, however, it is not clear how the issues of representativeness and comparability were dealt with or if there is any effect from them on the results and conclusions.

    b. Page 5-1, statistical evaluation section, last sentence states, "For this reason, the data for these 15 metals and perchlorate from the specific geologic formation, alluvium, or Muddy Creek Formation, or from specific ranges of depth, 20 ft or less or 30 ft or more, should be used separately for future comparisons with downgradient data." Based on the previous two sentences, this statement does not make sense. Specifically, which 15 metals are referenced? Additionally, it is not clear how the results of the differences among borehole analysis are useful in a decision-making context.

c. Page 5-1, section "Statistical comparison with Off-Site Data Sets", second sentence states, "Statistical comparisons between the Tronox and COH data sets indicate that all species, except arsenic and iron and selenium represent different populations and should not be combined for subsequent analyses." This conclusion for Selenium needs to be supported by additional interpretation of results found on Page 4-9, section Upgradient Data vs. Background Data, paragraph 2. Note again, given this analysis a more reasonable conclusion is that the TRX and background datasets should not be combined.
d. Page 5-1, section "Statistical comparison with Off-Site Data Sets", last sentence states, "Because arsenic, iron and selenium concentrations did not exhibit statistically significant differences in their mean or median concentrations or standard deviations, those parameters, for the samples collected at depths of 20 ft or less, from the COH and Tronox datasets can be combined for subsequent analysis." The results for differences in standard deviation for subsets of the data have not been presented or discussed in the text.
e. Page 5-2, background comparisons in general. Comparability is a very important issue for comparing two different data sets. There should be some discussion of this issue.
f. Page 5-2, first sentence states, "Statistical comparisons between the Tronox and BRC/TIMET data sets indicate that all species, except calcium and lead, represent different populations and should not be combined for subsequent analyses." The reasoning for not combining any of the analytes except calcium or lead needs to be better explained either here or on Page 4-9, section "Upgradient Data vs. Background Data", third paragraph. Specifically, Page 4-9, section "Upgradient Data vs. Background Data", third paragraph, first sentence states " Differences between the means or medians of Tronox and BRC/TIMET data are not statistically significant for 11 of the 27 chemicals that were measured in both studies." However, 9 of the 11 chemicals (excluding lead and calcium) are not discussed.
g. Page 5-2, second paragraph, last sentence states, "Statistical comparisons between the Tronox and BRC/TIMET data sets indicated that data for thorium 230 and uranium 234 could probably be combined for subsequent analysis." This conclusion is made based on results presented in Page 4-10, section "Upgradient Data vs. Background Data" second paragraph, although this paragraph does not explicitly state which datasets are being compared to obtain these results. Previous more general comments about combining datasets apply, again.
h. Page 5-2, section "Groundwater Sampling Comparison", second paragraph, first sentence states, "In general, the less soluble constituents appear to be affected more than the highly soluble constituents." It should be mentioned in this statement that differences in measured concentrations between methods is a function of solubility.
i. Page 5-2, Evaluation for matrix effects section. Again, it is not clear exactly what the purpose is of this evaluation.

j. Page 5-2, Groundwater Sampling Comparison section, "Perchlorate", states "Below a depth of 20 ft bgs, perchlorate was not detected in soil samples until 50 ft bgs, which suggests that the perchlorate at this depth in soil is not related to vertical downward migration of shallow sources but is related to the perchlorate in the groundwater." Is it possible that the decreased concentrations observed above ground water but below 20 ft. are a consequence of fluctuations in the water table that "wash" the perchlorate out of the soil and into ground water? Also, the text indicates that perchlorate is present upgradient. Isn't there also an onsite source? Some clarification would help.

32. Figure 3-1. The diagram provides a flow path for statistical analysis steps. The first problem with this type of approach is that it takes professional judgement out of the decision making process. Exploratory data analysis and statistical test results are disjointed, which is also evident in the main report. In addition, many statistical tests are performed on the same subsets of data, in which case a different *p*-value should be used if an omnibus *p*-value of 0.05 is desired. Simplification is possible by not performing log –transforms ,which can only lead to conclusions in the log-space, so they are not very useful. The final conclusions are based on the test statistic results with a straight comparison to a *p*-value of 0.05. Apart from probably being the wrong *p*-value to use in the context of family-wise error rates, a straight comparison without revisiting the data implies a lack of interpretation of the entire statistical package that is offered. This is evident in the main report. Much more needs to be made of all of the statistical tools and analyses.
33. Figure 4-7 by itself is not very useful. Other ways of displaying single distributions could be used, such as histograms and density estimates, but the basic issue remains. Single plots of the combined TRONOX data are not very helpful.
34. Table 4-4. For Well IDs H-11 and M-117, the detection limit is 16 µg/L, which is four times greater than the detection limit for TR-07 and TR-09. Additionally, since the USEPA PRG is equal to 4 µg/L, the utility of these samples may be limited.
35. Appendix E, the NDEP has the following comments:
    a. General comment, the groundwater radionuclide data is not in secular equilibrium. Please discuss this matter in the main body of the report.
    b. The NDEP's review of this Appendix included a supplemental deliverable that was provided by TRX. Please include this information in the finalized report.
    c. Table E-6 contains a column labeled "Results." However, these are not actually the sample concentrations but the reporting limits in most cases. The Table should clarify this discrepancy.
    d. Section 3.3, page 7. The report states, "No data from the SW-846 601B analyses ..." Please revise "601B" to "6010B".
    e. Section 3.4 and General, regarding trip blanks, the report states, "No data required qualification due to trip blank contamination." However, there is confusion whether trip blanks were included with these samples. Section 3.8.1 of the main report indicates trip blanks were included in the field QA/QC. However, the data validation memos labeled "TH021voclms.rev" and "TH018voclms.rev" indicate that no trip blanks

were submitted. The data validation report should clarify if, or for which sample sets, trip blanks were included for the VOC analysis.

36. Appendix F, the NDEP has the following comments:
    a. Section 1.1, page 1-1, Item 1. Was the Gehan ranking scheme also used for the Kruskal-Wallis test when non-detects were involved?
    b. Section 1 subsections. There is a lot of redundancy in these subsections, suggesting that the subsections could be reorganized to reduce repetition.
    c. Other statistical comments have been made in the main text, but they apply equally here.
    d. Section 1.1, page 1-1, subsection 1, sentence 1 states, "The results from an Analysis of Variance (ANOVA) to compare the mean concentrations of the chemical by soil boring and the results from a Kruskal-Wallis test to compare the median concentrations by soil boring." If a regular ANOVA model is run (i.e. fixed effects) then the interpretation is valid for only those borings where samples were taken. If, however, a random effects model were run, then this approach would allow for inferences among all possible boreholes.
    e. Section 1.1, page 1-2, number 6b, first sentence states "If both sets of data were considered to follow lognormal normal distributions, a t-test was performed on the logarithms of the data to compare the means of the logarithms of the data." First, it is not clear what it means for data to follow a "lognormal normal" distribution. Second, it is not clear that it is of interest to detect differences between the means of the logarithms of the data. Differences in the means of the logarithms of the data are not equivalent to differences in the means of the untransformed datasets.
    f. Page 2-17 appears to have a graphics error.
    g. Table F-1. The title has a typo. TRONOX is spelled TONOX.
    h. Comment 12a of the meeting minutes from 1/16/2007 states "It was noted that the TRX upgradient data showed conformance with the BRC/TIMET background data set via the box and whisker plots but not via the quantitative statistical tests." The test results appear to have been interpreted correctly. Since the tests were performed as two-sided tests, significant differences will be indicated if, for a given analyte, either the center of the distribution of the Upgradient data is greater than center of the distribution for the BRC/TIMET data or the center of the distribution of the BRC/TIMET data is greater than center of the distribution for the Upgradient data. This is a possible reason for the confusion.

37. Appendix I, the NDEP has the following comments:
    a. 1st subsection titled "Historical Groundwater Sampling". The first sentence makes a statement that is not achievable from the data analysis. The data analysis can point to a difference, but the nature of the difference can only be provided by a conceptual understanding of why it occurred. The difference cannot by itself point to a conclusion of which method is most representative.

b. Other statistical comments have been made in the main text, but they apply equally here. These pertain mostly to the need to run paired *t*-tests instead of relying on RPD.
c. Page 3 of 3. For example, arsenic is classified as a metal that did not meet the RPD standard. However, it failed in only 1 of the 6 pairs. Considering the data as a whole would lead to a different conclusion for arsenic (i.e., that, statistically, there are no differences).
d. Page 1, based on this memorandum it appears that the wells were sampled via a bailer, a micro-purge pump was installed and then the well was sampled via micro-purge techniques. The specific timing of these activties needs to be discussed. Please note that these activties would result in a large amount of agitation (and volatization) within the well. These issues should be discussed in the body of the Appendix.
e. Page 2, since TPH, VOCs, and other compounds were not detected, this study was of limited use. The volatile compounds are of particular interest when discussing bailers and micro-purge techniques. Metals and radionuclides are also of interest and the study did note significant differences in these analyses.
f. Page 3, TRX summarizes the results of the study but does not draw any significant conclusions. For example, the study does demonstrate that bailing does bias some metals and radionuclides artificially high. In addition, it appears that bailing does bias some VOCs artificially low. It would benefit TRX to utilize the micro-purge technique to produce more representative data.
g. Additional comments on the micropurge method are provided below:

Low flow purging and sampling is a method of collecting a "representative" sample using the maximum flow rate that causes minimum drawdown; thereby, minimizing the stress to the groundwater system. Mobile colloid particles ranging in size from 1 to 1,000 nm have been observed under different conditions. For a sample to be considered representative of the formation water, the sample should contain the total mobile contaminant loading that includes both the dissolved contaminants and the naturally suspended particles (Puls & Barcelona 1996; Powell & Puls 1997; Kearl et al. 1994). Using low flow purging and sampling helps prevent the entrainment of larger, not naturally mobile particles into the groundwater. Low flow purging and sampling are applicable for various contaminants and naturally occurring analytes including volatile and semi-volatile organic compounds (VOCs and SVOCs), metals, other inorganic compounds, pesticides, polychlorinated biphenyls (PCBs), other organic compounds, radionuclides, and microbiological constituents. Low flow purging and sampling are not applicable for non-aqueous-phase liquids (ASTM 2002; Yeskis & Zavala 2002; Richey 2002, FDEP 2003).

The typical range of flow rates vary from 0.1 to 0.5 L/min. Some high permeability formations may be able to use flow rates as high as 1 L/min (US EPA Region 1 1996; Powell & Puls 1997; ASTM 2002; Ritchey 2002; Kaminiski 2003). The actual flow rate and amount of drawdown that may be sustained for a particular monitoring well should be determined prior to sampling. A stabilized pumping water level should be achieved with minimal

drawdown (to minimize stress to the system) at as high a flow rate as possible (to minimize sampling time). Minimizing turbulence should also be considered when selecting a flow rate (Barcelona et al. 2005). Minimal drawdown may vary from inches for high permeability formations to several feet for low permeability formations (FDEP 2003; Barcelona et al. 2005). The flow rate should not be determined by assigning an arbitrary number for acceptable drawdown. Minimal drawdown and corresponding flow rate will be dependent upon hydrogeologic setting and well construction characteristics (Barcelona et al. 2005).
The advantages of low flow sampling are collection of groundwater samples that are representative of the mobile contaminant load, minimization of sampling artifacts, less operator variability with greater operator control, minimization of stress on formation, minimization of mixing of stagnant casing water with formation water, reduced need for filtration of samples, reduced waste generation, and higher sample consistency (NMED 2001; Puls & Barcelona 1996). The disadvantages of low flow sampling are higher initial capital costs, longer set-up time in field, additional equipment to transport, and increased training of staff (Puls & Barcelona 1996). It should be noted that the costs of obtaining representative groundwater samples may be insignificant to the costs of potential remediation decisions made based on the data collected from the samples (Yeskis & Zavala 2002).

Metals sampling should not be conducted with bailers due to increased turbidity, which may bias metals concentrations high if the samples are not filtered (Yeskis & Zavala 2002; Kaminiski 2003). However, filtering samples may bias metal concentrations low due to the filtration of naturally mobile suspended solids (Puls & Barcelona 1996; Browner, 1997). Filtering of samples has also been shown to produce inconsistent results in terms of metals mobility (Kearl et al. 1994). No filtration or sampling method exists to restore data quality of a groundwater sample after the aquifer matrix and/or sand pack has been disturbed during purging / sampling and turbidity has been artificially increased (Powell & Puls 1997). Sampling with a bailer may also bias metals concentrations by the agitation of groundwater during the insertion and removal of the bailer, causing the introduction of air into the well bore and consequently cause some metals to precipitate (Kaminiski, 2003). VOC sampling should not be conducted with the use of bailers, which may bias VOC concentrations low due to the agitation of the groundwater and the introduction of air into the groundwater within the well (NMED 2000, US EPA Region 4 2001; Yeskis & Zavala 2002; Kaminiski 2003).

Dedicated sampling pumps are recommended for low flow purging and sampling to avoid the generation of excess turbidity caused by insertion of the sampling pump thereby mixing the stagnant water in the casing above the screen with the screened interval water zone. Additionally, insertion of a portable system may cause the resuspension of solids that may have collected at the bottom of the well (US EPA Region 9 1995; Puls & Barcelona 1996; NMED 2000). Dedicated sampling pumps are also recommended to reduce the amount of waste material generated by minimizing purge volume required for stabilization of water quality indicator parameters. The time required for set-up and purging is also reduced with the dedicated systems (Puls & Barcelona 1996). Dedicated sampling pumps would not be as important in wells screened across the water table as for wells with submerged screens where stagnant water would exist above the screen interval. If dedicated sampling pumps cannot be left in-place, then the sampling pump should be slowly lowered into the screened interval to

minimize mixing followed by immediate low-flow purging and sampling (Powell & Puls 1997).

Recent research has demonstrated that the entire screened interval is sampled during a low-flow purging independent of pump placement within the screened interval. Additionally, this research demonstrated that the ratio of flow yielded by higher permeability layers versus lower permeability layers is independent of pump placement within the screened interval (Varljen et al. 2006).

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ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

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

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

March 19, 2007

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to:
Community Involvement Plan
dated March 14, 2007

Dear Ms. Crowley,

The NDEP has received and reviewed TRX's report identified above and provides comments in Attachment A. Please respond to the NDEP's comments with a response-to-comments letter or in a meeting. These issues can be discussed in person or via telephone. Please respond **by April 2, 2007**.

If there are any questions please do not hesitate to contact me.

Sincerely,

Brian A. Rakvica, P.E.
Supervisor
Bureau of Corrective Actions
Special Projects Branch
NDEP-Las Vegas Office

CC: Jim Najima, NDEP, BCA, Carson City
Shannon Harbour, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Keith Bailey, Tronox, Inc, PO Box 268859, Oklahoma City, Oklahoma 73126-8859
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W., Washington, D.C. 20036
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
Rob Mrowka, Clark County Comprehensive Planning, PO Box 551741, Las Vegas, NV, 89155-1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, CO 80402
Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110

Attachment A

1. General comment, please add Shannon Harbour, NDEP, Las Vegas as a CC to all future correspondence.
2. Section 3.0, page 3, general comment, perhaps TRX should include a section which discusses public notifications. Occasionally, it may be necessary to post a notice in the local newspapers or through another media outlet. Additionally, it may be necessary to distribute a mailing to a suitable list of stakeholders. Both of these items should be considered. It is suggested that TRX review the approved Basic Remediation Company CIP or the Stauffer/Montrose CIP.
3. Section 3.1, page 3, the NDEP would like to note that TRX should feel free to provide suggestions to the NDEP if there are documents that TRX believe would be helpful to post on the NDEP website.
4. Section 3.4, page 4, the NDEP has the following comments:
    a. There are a number of issues with the current repository as follows:
        i. The repository is not large enough to contain all of the documents that are submitted.
        ii. The repository does not maintain any sort of cataloging system for documents that are submitted.
        iii. The repository is frequently pilfered. Documents are stolen wholesale or in parts.
    b. The NDEP believes that the current repository does not fulfill the needs of a Community Involvement Plan. TRX should explain how the above issues will be addressed or should consider participation in the new repository being established by Basic Remediation Company.

Basic Remediation
COMPANY

Transmittal

To: Brian Rakvica ***Date:*** **3/8/07**

From: Ron Sahu
Director of Environmental Services

Company: NDEP
1771 E. Flamingo Road, Suite 121-A
Las Vegas, Nevada 89119

VIA:
- ☐ Pick up
- ☐ Courier
- ☐ Overnight Courier
- ☑ Hand Delivered
- ☐ US Mail

The following items are for your:

☐ Return	☐ Review & Comments	☐ Signature
☑ Records	☐ Review & Approval	☐ Information

We are transmitting the following:

1 Hard Copy of Phase I Environmental Site Assessment for Tronox Parcels

Comments:

Received by: _____

875 West Warm Springs, Henderson, Nevada 89015 • Phone 702.567.0400 • Fax 702.567.0473

TRONOX

Susan Crowley
Staff Environmental Specialist

(702) 651-2234
Fax (405) 302-4607
susan.crowley@tronox.com

February 22, 2007

William Frey
Senior Deputy Attorney General
Nevada Department of Justice
100 N. Carson Street
Carson City, NV 89701-4717

Dear Mr. Frey: Bill

Subject: Request for Time Extension on Combined Tronox Remedial Project Reports

Earlier this year, Tronox LLC (Tronox) requested revision of two documents; the 1986 chromium remediation Consent Order between Tronox (formerly Kerr- McGee Chemical LLC) and Nevada Division of Environmental Protection (NDEP), and the April 2005 perchlorate remediation Administrative Order on Consent (AOC). The requested revision of each would reset the date for remedial performance report submittal to 60 days following a covered period.

Attached are the fully executed copies (2) of the 1986 Consent Order modification page and the partially executed copies (2) of the 2005 AOC modification page.

Please forward one fully executed modification page for each document to us, once the signatory process is complete. Thank you very much for your consideration of our request. Please feel free to contact me at (702) 651-2234 if you have any questions. Thank you.

Sincerely,

Susan Crowley, CEM 1428 exp 3-8-07
Staff Environmental Specialist

Overnight Mail

Cc: Keith Bailey
Todd Croft
Elizabeth Hurst

Ed Krish
Brian Rakvica
Tom Reed
Rick Stater

Attachment A

Signature Pages
For Executing Modifications in:

1986 Chromium Consent Order (2each)

2005 Perchlorate Administrative Order on Consent (2 each)

Modification of **1986 Consent Order**

This document modifies the consent Order, dated September 9, 1986, between the Nevada Division of Environmental Protection (Division) and Tronox LLC, (Tronox), formerly Kerr-McGee Chemical LLC. It extends the performance report due date. The modification is needed to include analytical from the last month of the reporting period as well as to harmonize and wed the formats of several performance reports, so that reports for several remedial project can be combined.

The following language will be added as a separate paragraph at the end of paragraph 12 of Consent Order:

"Performance reports will be submitted to NDEP on a semi-annual basis within 60 days of June 30th and December 31st each year."

All terms and conditions of the Consent Order shall remain in full force and effect.

In witness whereof, the Division and Tronox execute this modification by their duly authorized representatives on this 28th day of January, 2007.

THE STATE OF NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

By: _____
Name: Leo Drozdoff
Title: Administrator
Date: 1/19/07

TRONOX LLC

By: _____
Name: Patrick S. Corbett
Title: Vice President
Date: 2/5/07

Approved as to form

By: _____
Name: William J. Frey
Title: Senior Deputy Attorney General
Date: 1-19-07

Modification of **1986 Consent Order**

This document modifies the consent Order, dated September 9, 1986, between the Nevada Division of Environmental Protection (Division) and Tronox LLC, (Tronox), formerly Kerr-McGee Chemical LLC. It extends the performance report due date. The modification is needed to include analytical from the last month of the reporting period as well as to harmonize and wed the formats of several performance reports, so that reports for several remedial project can be combined.

The following language will be added as a separate paragraph at the end of paragraph 12 of Consent Order:

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THE STATE OF NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

By: _____
Name: Leo Drozdoff
Title: Administrator
Date: 1/19/07

TRONOX LLC

By: _____
Name: Patrick S. Corbett
Title: Vice President
Date: 2/5/07

Approved as to form

By: _____
Name: William J. Frey
Title: Senior Deputy Attorney General
Date: 1-19-07

Modification of 2005 Administrative Order on Consent

This document modifies the Administrative Order on Consent, dated April 12, 2005, between the Nevada Division of Environmental Protection (Division) and Tronox LLC (Tronox LLC (Tronox), formerly known as Kerr-McGee Chemical LLC. It extends the performance report due date. The modification is needed to include analytical from the last month of the reporting period as well as to harmonize and wed the formats of several performance report, so that reports for several remedial project can be combined.

The modified AOC language is as follows:

> Page 7 and 8: Section VI – 2. Quarterly Progress Reports – once Kerr-McGee begins operation of the expanded biological treatment plant, in lieu of the monthly described in Section VI.1., Kerr-McGee shall include a description of the operations of it's AP-5 decommissioning operations in the quarterly reports required by Section VI of the 2001 AOC. Such reports are due 60 days following each three month period of operation, but at it's discretion NDEP may change the reporting interval to require only semi-annual reporting.

All other terms and conditions of the AOC shall remain in full force and effect.

In witness whereof, the Division and Tronox execute this modification by their duly authorized representatives on this 28th day of January, 2007.

THE STATE OF NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

By:_____
Name: Leo Drozdoff
Title: Administrator
Date: _____

TRONOX LLC

By: Patrick S. Corbett
Name: Patrick S. Corbett
Title: Vice President
Date: 2/15/07

Approved as to form

By: _____
Name: William Frey
Title: Senior Deputy Attorney General
Date: _____

Modification of 2005 Administrative Order on Consent

This document modifies the Administrative Order on Consent, dated April 12, 2005, between the Nevada Division of Environmental Protection (Division) and Tronox LLC (Tronox LLC (Tronox), formerly known as Kerr-McGee Chemical LLC. It extends the performance report due date. The modification is needed to include analytical from the last month of the reporting period as well as to harmonize and wed the formats of several performance report, so that reports for several remedial project can be combined.

The modified AOC language is as follows:

> Page 7 and 8: Section VI – 2. Quarterly Progress Reports – once Kerr-McGee begins operation of the expanded biological treatment plant, in lieu of the monthly described in Section VI.1., Kerr-McGee shall include a description of the operations of it's AP-5 decommissioning operations in the quarterly reports required by Section VI of the 2001 AOC. Such reports are due 60 days following each three month period of operation, but at it's discretion NDEP may change the reporting interval to require only semi-annual reporting.

All other terms and conditions of the AOC shall remain in full force and effect.

In witness whereof, the Division and Tronox execute this modification by their duly authorized representatives on this 28th day of January, 2007.

THE STATE OF NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

By: _____
Name: Leo Drozdoff
Title: Administrator
Date: _____

TRONOX LLC

By: _____
Name: Patrick S. Corbett
Title: Vice President
Date: 2/15/07

Approved as to form

By: _____
Name: William Frey
Title: Senior Deputy Attorney General
Date: _____

Brian Rakvica

From: Crowley, Susan [Susan.Crowley@tronox.com]
Sent: Thursday, February 22, 2007 2:53 PM
To: William Frey
Cc: Todd Croft; Bailey, Keith; Brian Rakvica
Subject: Modification Pages for 1986 CO and 2005 AOC
Attachments: 20070222144113118.pdf

Bill,
Please find attached an electronic version of a document that should be delivered to your office tomorrow morning, by FedEx. In it you will find the two fully executed copies of the 1986 chromium Consent Order modification pages ... as well as two partially executed copies of the 2005 perchlorate Administrative Order on Consent. We'll need one copy of each back as the signatory process is complete. Thank you very much for your consideration of our request.

<<20070222144113118.pdf>>

Susan Crowley
susan.crowley@tronox.com

Tronox LLC
PO Box 55
Henderson, NV 89009
(702) 651-2234 office
(702) 592-7727 cell
(405) 302-4607 fax (note new fax number)

ISSUED 1/24/07

Meeting Minutes

Project:	Tronox (TRX)
Location:	NDEP – Las Vegas
Time and Date:	10:00 AM, January 16, 2007
Meeting Number:	---
In Attendance:	NDEP-BCA – Brian Rakvica, Shannon Harbour, Todd Croft Tronox – Keith Bailey, Susan Crowley Neptune – Paul Black (for NDEP) Teri Copeland (for NDEP)

CC: Jim Najima

1. The meeting was held to discuss the development of the Phase A report and Phase B Work Plan (WP).
2. TRX noted that data from the Phase A scope of work (SOW) is still being received. STL is approximately 4 weeks behind schedule. ENSR will be performing the data validation.
3. TRX noted a desire to determine the appropriate criteria for selecting the analytes for which site characterization is complete. It was proposed that hypothetical situations would be reviewed.
    a. Are radionuclide concentrations consistent with background?
    b. Are VOC concentrations in excess of applicable PRGs or leaching criteria?
    c. It was noted that the Phase A data should be tied to the CSM and determine what is logically needed to determine the nature and extent of contamination. Dividing the Site into logical sub-areas will allow TRX to expedite this process.
4. It was clarified that future land use will remain commercial/industrial.
5. NDEP discussed the existence of the Uniform Environmental Covenants Act (UECA) in Nevada and how this process could be used to restrict the deed of the property.
6. TRX agreed that remediation may be an option for areas of the Site to achieve compliance. NDEP noted that it may be useful to complete interim remedial actions before determining nature and extent of all contaminants. Some areas of the Site may be sufficiently impacted that additional characterization is not prudent prior to completion of remedial actions.
7. Discussion of dioxin/furans.
    a. It was noted that if Site concentrations were below 50 ppt TEQs that dioxin/furans would not be a concern.
    b. It was noted that if dioxin/furan concentrations are above 50 ppt but below 1,000 ppt TEQs that TRX should discuss this issue with the NDEP prior to proceeding.
8. Logical outputs of the Phase A SOW are as follows:
    a. Preliminary development of sub-areas of the Site.

b. Nature and extent for some site-related chemicals may have been achieved. The NDEP noted that this may not represent a cost savings to TRX unless an entire suite of chemicals (e.g.: VOCs or radionuclides) can be eliminated from select sub-areas. NDEP noted that these issues should be discussed with the NDEP prior to development and submittal of a report.
c. Development of the Phase B SOW. It was discussed that this could be included as part of the Phase A report and that this would save TRX some time. This document should be brief and should provide the following:
    i. Figure, showing locations of borings/wells.
    ii. Table, showing depths of borings/wells and analytical suites.
    iii. The text of the Phase A report should provide the justification for the Phase B SOW.
    iv. Phase B WP should be designed to be dynamic to minimize submittals to the NDEP.
d. TRX hopes that the radionuclide suite can be limited to gamma spectroscopy after this round of sampling. NDEP will review once the data is received.

9. Sub-areas discussion.
    a. It was noted that risk assessments should be performed on a sub-area specific basis.
    b. It was noted that sub-areas should be determined based on the CSM as well as chemical analyses.
10. Risk assessment discussion.
    a. NDEP noted that TRX may perform a number of internal iterations of the risk assessment to determine what the drivers are.
    b. NDEP suggests that TRX not submit the risk assessment until it is established that the risk assessment will pass.
    c. NDEP is amenable to meetings where preliminary risk assessments can be discussed and interim actions can be proposed.
    d. NDEP noted that the risk assessments should not be submitted until these interim actions are completed and confirmatory samples have been collected.
11. NDEP noted that it would be helpful to meet once all the data is received and some basic presentation materials have been developed. For example, basic summary statistics, some tables and maps. NDEP can help TRX review some of the issues discussed above.
12. Discussed upgradient and background data/comparisons.
    a. It was noted that the TRX upgradient data showed conformance with the BRC/TIMET background data set via the box and whisker plots but not via the quantitative statistical tests.
    b. NDEP noted that this may be related to several factors:
        i. Sample population for the TRX upgradient set is small and is being compared to a set that is large.
        ii. "p" value being used is incorrect for the situation.

iii. Perhaps the data should have only been compared to the McCullough portion of the background data set.
iv. NDEP is reviewing this report currently and hopes to have a better idea in the next two weeks.

c. NDEP noted that it is likely that much of the upgradient data is usable once it is demonstrated.

13. Discussed tentative schedule.
    a. Phase A report and Phase B WP – submit/approved by mid-2007.
    b. Phase B WP implementation – end-2007.
    c. Risk assessment – following.
14. Discussed NPDES permitting and related topics.
    a. TRX is performing some calculations to verify the validity of the mixing zone scenario under future conditions.
    b. NDEP presented information known regarding the termination of the use of the City of Henderson (COH) RIBs and the SCOP project. It was noted that only 1 MGD of effluent is expected to be injected into the Birding Preserve each day. The remainder of the effluent will be transmitted to the Wash or SCOP pipe.
    c. It was noted that the SCOP project is expected to leave ~30 MGD of effluent in the Las Vegas Wash in addition to a projected 20 MGD base flow.
    d. NDEP noted that these projects will reduce the availability of dilution water in the Las Vegas Wash as well as in the Seep Area.
    e. NDEP noted that it is possible and likely that concentrations of a number of contaminants (TDS and organics) may increase in the Seep Area. NDEP strongly encourages TRX to research this issue to prevent any possibility of an upset condition in the future.
    f. Discussed TRX GAC beds. It was noted that samples are not collected pre- and post-GAC. NDEP noted that it may be beneficial to determine if the GAC beds are removing organics or if the organics are simply not present in the influent currently. NDEP believes that it is unlikely that the GAC beds are effective since they have never been replaced.

TRONOX

Susan Crowley
Staff Environmental Specialist

(702) 651-2234
fax (405) 302-4607
susan.crowley@tronox.com

January 15, 2007

Mr. Brian Rakvica, P.E.
Nevada Division of Environmental Protection
1771 East Flamingo Road, Suite 121-A
Las Vegas, Nevada 89119

Dear Mr. Rakvica:

Subject: Tronox LLC ECA Quarterly Report – Fourth Quarter 2006

Pursuant to Section XIII of the Consent Agreement, signed September 5, 1996, between Nevada Division of Environmental Protection (NDEP) and Tronox LLC (Tronox), we submit the following quarterly status report for the Henderson facility's Environmental Conditions Assessment (ECA).

Activities Conducted, 10-01-06 to 12-31-06

Conceptual Site Model:

- CSM remains unchanged until additional data justifies revisions

Upgradient Investigation Results:

- October 30 – The draft *Upgradient Investigation Results Report* was submitted to the NDEP.
- November 14 – NDEP transmits e-mail comments requesting additional data and clarification on data validation.
- November 17 and 29 – Tronox responds to NDEP comments and request for additional data.
- December 15 - Tronox provides Paul Black (NDEP consultant) additional data CDs.

Phase A - Source Area Investigation

- October 2 – Tronox submits the *Phase A – Source Area Investigation Workplan* (Phase A Workplan) to NDEP.
- October 23 – NDEP transmits e-mail comments on the Phase A Workplan to Tronox.
- October 26 - Tronox submits revised Phase A Workplan to NDEP (redline-strikeout format).
- October 31 – Tronox received authorization to proceed with Phase A field work, supported by the BRC SOPs rather than the Tronox SOPs. Tronox received approval from BRC to utilize the NDEP approved SOPs prior to field work commencing.
- November 1 – Tronox mobilizes ENSR to the field to begin data collection in accordance with the Workplan submitted earlier.
- November 1 to December 8 – Field work associated with the Phase A Workplan, including soil and groundwater sampling, is conducted. Samples were submitted to STL laboratories with support from CAS (dioxin) and EMSL (asbestos) laboratories.

QAPP and SOPs:

- October 11 – NDEP provides Tronox with comments to QAPP.
- October to December – Tronox is preparing a revised QAPP which incorporates NDEP comments.
- October to December - Tronox is preparing Tronox-specific SOPs based on NDEP-approved BRC SOPs.

Other

- October 16 – Tronox issued 3rd Quarter ECA Status Report to NDEP.
- October 25 – Tronox submits *Quarterly Performance Report – Perchlorate Recovery Program, July – September 2006 (3d Quarter 2006 Report).* The next quarterly Perchlorate Recovery Program Report (4th Quarter 2006 reporting period) will be combined with the next semi-annual Chromium Performance report; into a single report. The NDEP provided verbal approval extending the submittal date of the combined report from January 28, 2007 to February 28, 2007. Approval from the Attorney General's office has been sought as well.
- November 16 – All-company meeting convened to discuss various inter-site issues, especially details regarding local and regional geology and hydrogeology.
- December 7 – All-company telephone conference call is convened as a follow-up to the November 16 meeting.
- December 7 – NDEP requires all BMI Plant Sites to prepare Community Involvement Plans (CIPs) by March 16, 2007.
- December 27, 2007 – Tronox transmits non-validated TR Well groundwater analytical data through March 2006 to NDEP.

Please note that the Tronox ECA "*Deliverable Schedule*" is attached. Feel free to call me at (702) 651-2234, if you have any questions. Thank you.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

Overnight Mail

Cc: See attached document distribution list

Attachment: ECA Deliverable Schedule

ENVIRONMENTAL CONDITIONS ASSESSMENT - DELIVERABLE SCHEDULE
Tronox LLC - Henderson, Nevada
Revised: January 15, 2007

Deliverable	Date
Conceptual Site Model * KM Response to NDEP May 6, 2005 Comments * KM Response to NDEP September 6, 2005 comments	February 28, 2005 – Submitted August 31, 2005 – Submitted October 14, 2005 – Submitted Further revisions will be completed as needed following additional data collection activities
Source Area Evaluation (SAE) * Phase A Work Plan * Phase A - Source Area Investigation * Phase A - Source Area Investigation Report	September 30, 2005 – Conceptual approach submitted. October 3, 2005 – NDEP approved conceptual approach October 21, 2005 – Workplan schedule submitted. February 28, 2006 - Workplan submitted October 2, 2006 – Revised Workplan Submitted November 1 to December 8, 2006 – Conducted field work. TBD.
Upgradient Investigation (formerly termed the Background Study) * Background Study Workplan * Tronox Response to NDEP May 6, 2005 Comments * Tronox Response to NDEP July 28, 2005 Comments and Submits Upgradient Investigation Workplan (revised Background Study Workplan) * Upgradient Investigation Workplan Addendum * Upgradient Investigation Field Work * Upgradient Investigation Report	 March 30, 2005 – Submitted July 22, 2005 – Submitted September 30, 2005 – Submitted October 4, 2005 errata sheets submitted February 28, 2006 – Submitted. March 13 – 24, 2006 – Conducted Field Work October 30, 2006 – Submitted to NDEP. Report is currently under NDEP review.
Quality Assurance Project Plan and Standard Operating Procedures	September 30, 2006 - Submitted September 30, 2006 - Submitted
PERIODIC MONITORING AND REPORTING	
ECA Phase II Status Report (Quarterly)	January 15; April 15; July 15; October 15, 2007
Combined Perchlorate and Chromium Remediation Performance Report	February 28, 2007;

Tronox Document Distribution List Updated: 24-Oct-06

Document Name: ECA Quarterly Update

Name (Last, First)		Firm	Distribution		
			Hard	e-Copy	Cvr Only
Croft	Todd	NDEP	X		
King	Val	NDEP	X		
Najima	Jim	NDEP	X		
Rakvica	Brian	NDEP	X		
Sous	Nadir	NDEP			
Tinney	Al	NDEP	X		
Palm	Jon	NDEP	X		
Pohlmann	Brenda	COH	X		
Conaty	Barry	COH Counsel	X		
Durr	Paul	DAQEM			
Hunsaker	Ross	DAQEM			
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Reed	Tom	Tronox	X		
Ellington	Toni	Tronox Counsel	X		
Stater	Rick	Tronox	X		
Crowley	Susan	Tronox	X		
Krish	Ed	ENSR	X		
Bilodeau	Sally	ENSR	X		
Gerry	Dave	ENSR	X		
Lambeth	Jeff	Veolia			
McDaniel	Tom	Veolia			
Cheung	Mary	Veolia			
Guerriero	Joe	AIG	X		
Giroux	Barry	GEI	X		
Stowers	Kirk	Broadbent			
Quillian	Jill	ERM			
Sahu	Rahnijit	BMI	X		
Crouse	George	Syngenta	X		
Erickson	Lee	Stauffer	X		
Kelly	Joe	Montrose			
Sundberg	Paul	Montrose	X		
Gibson	Jeff	AmPac			
Sylvia	Chris	Pioneer	X		
Wilkinson	Craig	Timet	X		
Mack	Joel	Montrose Counsel			

Brian Rakvica

From: BILL FREY [WJFREY@ag.state.nv.us]
Sent: Friday, January 12, 2007 3:54 PM
To: Susan Crowley
Cc: Brian Rakvica; Todd Croft; Elizabeth Hurst; Keith Bailey; Rick Stater
Subject: Re: Tronox Request to Modify Remediation Report Delivery Date

Susan,
Thanks. I don't anticipate a problem with this. I will discuss it with Brian, Todd and Jim Najima, next week. I will call you if I have any questions.

Bill

>>> "Crowley, Susan" <Susan.Crowley@tronox.com> 1-12-07 3:37 >>>

Bill,
Attached you will find an electronic version of a doc which is being sent to you via overnight mail. Please give me a call or e-mail if you have any questions at all. Thanks.

<<Trx to NDEP - 1-10-07 re Time Extention for Report Filing.pdf>>

Susan Crowley
susan.crowley@tronox.com
Tronox LLC (formerly Kerr-McGee Chemical LLC)
PO Box 55
Henderson, NV 89009
(702) 651-2234 office
(702) 592-7727 cell
(405) 302-4607 fax (note new fax number)

Brian Rakvica

From: Crowley, Susan [Susan.Crowley@tronox.com]
Sent: Friday, January 12, 2007 3:37 PM
To: wjfrey@ag.state.nv.us
Cc: Bailey, Keith; Hurst, Elizabeth; Stater, Rick; Todd Croft; Brian Rakvica
Subject: Tronox Request to Modify Remediation Report Delivery Date
Attachments: Trx to NDEP - 1-10-07 re Time Extention for Report Filing.pdf

Bill,
Attached you will find an electronic version of a doc which is being sent to you via overnight mail. Please give me a call or e-mail if you have any questions at all. Thanks.

<<Trx to NDEP - 1-10-07 re Time Extention for Report Filing.pdf>>

Susan Crowley
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TRONOX

Susan Crowley
Staff Environmental Specialist

(702) 651-2234
Fax (405) 302-4607
susan.crowley@tronox.com

January 10, 2007

William Frey
Senior Deputy Attorney General
Nevada Department of Justice
100 N. Carson Street
Carson City, NV 89701-4717

Dear Mr. Frey:

Subject: Request for Time Extension on Combined Tronox Remedial Project Reports

Tronox LLC (Tronox), formerly Kerr-McGee Chemical LLC (Kerr-McGee), is engaged in several environmental remediation projects in the Henderson, NV area. The first project is related to chromium and remedial activities are directed by a 1986 Consent Order between Kerr- McGee and Nevada Division of Environmental Protection (NDEP). The second project is related to perchlorate and remedial activities are directed by a series of Administrative Orders on Consent (AOC) - the most recent dated April 2005. Copies of these documents are included in Attachment A to this correspondence for your convenience.

Both of these remedial projects require remedial progress reporting by the 28th day of the first month following the reporting period. In the case of chromium, the reports are filed semi-annually and in the case of perchlorate, the reports are filed quarterly. In discussions with NDEP, we collectively find benefits in combining reports for the two remediation projects. The first report of 2007 for each project (semi-annual for chromium and quarterly for perchlorate) is due January 28th and this reporting effort will be the first attempt at accomplishing the combined reporting. The difficult task of including the required project information, while wedding the dissimilar formats, is the first of two reasons for our request to delay the reports to 60 days following the end of the reporting period.

The second reason for a time extension involves difficulties in completing required analytical work. The current requirement to submit the reports by the 28th day following the end of the reporting period makes it very difficult to include the analytical data from the last month of the reporting period. Despite our best efforts, the last month's analytical data are sometimes not received before the reporting due date and must be included in subsequent project reports.

Both Todd Croft (Tronox's NDEP case officer for the perchlorate project) and Brian Rakvica (Tronox's NDEP case officer for the chromium project) are agreeable to extending the deadline for the first report of 2007. They are also supportive of modifying Consent Order and AOC language to require subsequent reports within 60 days of the end of a reporting period. Accordingly, Tronox requests that the reporting requirements in both agreements be modified to "reports are due on the 60th day following" the end of the reporting period. Signature sheets to accomplish the change are attached.

As the combined report format is evaluated by NDEP, additional format and/or reporting frequency modifications may be needed to fulfill NDEP's information needs. Please feel free to contact me at (702) 651-2234 if you have any questions regarding our request. Thank you.

Sincerely,

Susan Crowley, CEM 1428 exp 3-8-07
Staff Environmental Specialist

Overnight Mail

Cc: Keith Bailey
Todd Croft
Elizabeth Hurst
Ed Krish
Brian Rakvica
Tom Reed
Rick Stater

Attachment A

1986 Consent Order

C:\SMC\My Documents\Word Doc

Consent Order
September 9, 1986

2005 Administrative Order on Consent

C:\SMC\My Documents\Word Doc

Administrative Order on Consent
April 12, 2005

SEP 22 1986

CONSENT ORDER

This Consent Order is made and entered into the 9th day of September, 1986, by and between the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection (hereinafter "Department"), and Kerr McGee Chemical Corporation, a corporation headquartered in the State of Oklahoma (hereinafter "KMCC").

WHEREAS, since December, 1983, the Department has directed KMCC to investigate and to remove chromium contaminants from the groundwater at KMCC's Henderson, Nevada plant facilities; the contaminants which are the subject of this Consent Order are at the Henderson facilities shown on the map attached as Appendix "A" and hereinafter described as the "Site"; and

WHEREAS, KMCC and the Department have agreed to enter into this Consent Order in order to effectuate a mutually satisfactory and prompt cleanup of the chromium contaminants at the Site, pursuant to the timetable set forth in Appendix B, without admitting or denying any liability or factual allegation with respect to any matters arising out of or relating to the Site, and without any part of the Order constituting an admission of liability or fault with respect to any allegation or matter which could be used against KMCC in any legal, equitable, or administrative proceeding.

NOW, THEREFORE, in consideration of, and in exchange for mutual undertakings and convenants herein, and intending to be legally bound hereby, the Department and KMCC agree as follows:

1. This Consent Order shall apply to and be binding upon the parties named herein, their successors and assigns in interest and all persons, firms, subsidiaries, corporations, and government entities acting for or on behalf

of the parties named herein. Any transfer of property or corporate interests does not operate to terminate KMCC responsibilities under this Order, except to the extent that the Department agrees to such termination in writing.

2. The undersigned respresentative of the parties named herein certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Order and to execute and to legally bind such party to this Consent Order.

3. The corrective action program required by this Order is limited to the treatment of chromium contaminants.

4. KMCC has undertaken and completed a hydrogeologic investigation to determine the location and design of a groundwater intercept system. Hydrogeologic investigative reports for the design and construction of the intercept system shall be submitted to the Department 30 days after the execution of this Order. These reports will include information on any rework of existing wells, sampling and analysis of specific wells, geologic data, hydrologic data, water quality data and results. These reports will also include a description of the intercept system alternatives which were considered, and the technical basis on which the recommended intercept system was selected and the other alternatives rejected.

5. KMCC shall design, construct and operate a groundwater intercept system consistent with the process design set forth in Appendix C which is hereby incorporated into this Order. The final design shall be approved by the Department prior to construction. The intercept system contained in Appendix C is described as a line of pumping wells, and the location of the intercept system is set forth in Appendix A which is hereby incorporated

into this Order. The intercept system project shall be ~~completed~~ initiated no later than 30 days after execution of this Order and completed pursuant to the timetable set forth in Appendix B which is hereby incorporated into this Order. Written progress reports on the design and construction shall be submitted at the end of the first calendar quarter after execution of this Order, and quarterly thereafter.

6. To monitor the effectiveness of the intercept system, KMCC shall install approximately ten water level wells within the area of the trough of depression created by operation of the intercept system. Locations of these water level wells are subject to approval by the Department and shall be as shown on the map attached as Appendix D which is hereby incorporated into this Order. Monthly manual readings will be taken from the water level wells beginning two months prior to startup of the intercept system. After one year KMCC may submit data which supports any reduction in frequency of monitoring to the Department for review and approval. Based on this review, the Department may approve a reduction in the required frequency of monitoring. Based upon the water level readings, a graphical respresentation will be prepared monthly showing the overlapping cones of depression, which will be proof of the effectiveness of the intercept system. One of the water level monitoring wells in the intercept area will be equipped with a level recorder which will be operated continuously. A second, continuously monitoring water level recorder will be placed in one monitoring well, down-gradient from the rechange trenches. The manual monthly monitoring, when compared to the continuous recording, will demonstrate the dependability of the continuous recorders for water level monitoring. After one year KMCC may submit data supporting the discontinuance of the manual monitoring. Notwithstanding the above, and upon approval by the

Department, KMCC shall select and monitor, semi-annually, certain wells in order to keep the area groundwater level map up-to-date. The wells described in subparagraph 17 must be sampled and analyzed quarterly for chromium to monitor groundwater quality.

7. If the monitoring results required in paragraph 6, occurring six (6) months after initial operation of the intercept system, demonstrate that the system is not effectively collecting the intended groundwater plume, the Department may require KMCC to implement the Contingency Plan set forth in paragraph 8.

8. KMCC shall prepare and submit to the Department for review and approval, an Intercept System Contingency Plan, pursuant to the schedule set forth in Appendix B. This Plan will set forth additional measures to be implemented to improve and update the installed Intercept System to correct, to the extent possible, the deficiencies identified. The Plan will be set forth as Appendix E and will be incorporated into this Order.

9. KMCC has undertaken a program to study various treatment alternatives. A report discussing the treatment alternatives which were considered and the basis on which the selection was made will be submitted to the Department no later than 30 days after execution of this Order.

10. KMCC shall install a chromium treatment system consistent with the process design set forth in Appendix F which is hereby incorporated into this Order. Such system shall be capable of achieving the Discharge Limit set forth in paragraph 11, below, pursuant to the timetable set forth in Appendix B. The final design of the treatment system shall be approved by the Department prior to construction. Written progress reports on the design and construction shall be submitted at the end of the first calendar quarter following execution of the Order and quarterly thereafter.

11. The Discharge Limit to be achieved is: Total Chromium $\leq$1.7 mg/l, Hexivalent Chromium $\leq$0.05 mg/l as a monthly average; Total Chromium $\leq$3.4 mg/l, Hexivalent Chromium $\leq$0.1 mg/l as a maximum single value on composite samples.

12. KMCC shall sample and analyze the end-of-pipe effluent from the treatment system, for the compound set forth in paragraph 11, in accordance with the procedures and protocols set forth in Appendix G which is hereby incorporated into this Order and are subject to the approval of the Department. Representative samples shall be taken three (3) times per week, but no more frequently than every other day. These samples shall be composited and analyzed once per week. Upon a satisfactory showing to the Department, KMCC may reduce the frequency of sampling and analysis.

13. The Discharge Limit established above in subparagraph 11 will be applicable no later than two (2) months after startup and initial operation of the treatment system. A violation of the Discharge Limit occurs when the value for chromium exceeds the established Discharge Limit.

14. KMCC shall prepare and submit a Treatment System Contingency Plan, pursuant to the schedule set forth in Appendix B. This Plan will set forth additional measures to be implemented to improve and upgrade the installed Treatment System to correct, to the extent possible, any failure of the Treatment System to meet the Discharge Limit. The Plan will be set forth in Appendix H which will be incorporated into this Order. Within 10 days after two consecutive monthly violations, KMCC shall submit for Department review and approval, the specific contingency plan and schedule of implementation for that plan. Upon approval, the plan shall be implemented. The Department agrees to waive the imposition of stipulated penalties as provided for in paragraph 24 during the review period and implementation of the

contingency plan so long as KMCC shows that the failure to meet the Discharge Limit was not due to its negligence.

15 KMCC has undertaken a program to study various treated solution disposal system alternatives. Within 45 days following execution of this Order, KMCC shall submit to the Department a report which will include a description of the disposal system alternatives which were considered, and the technical basis on which the selected disposal system was selected and the other alternatives rejected.

16. KMCC shall design, construct and operate an underground disposal system for treated groundwater consistent with the process design set forth in Appendix I which is hereby incorporated into this Order. The final design of the disposal system shall be approved by the Department prior to construction. The location of the underground disposal is set forth in Appendix A. This project shall be completed pursuant to the timetable set forth in Appendix B. Written progress reports on the design and construction shall be submitted at the end of the first calendar quarter following execution of the Order and quarterly thereafter.

17. KMCC shall provide monitoring wells at locations set forth in Appendix J which will be incorporated into this Order to measure quarterly the impact of the underground disposal system on groundwater levels. The Department and KMCC agree that any increase in the groundwater level, attributable to underground disposal of KMCC-treated water, that causes surfacing, wet spots, or degrades soil characteristics to threaten man-made improvements, shall require KMCC to implement the Disposal System Contingency Plan set forth in paragraph 18, below.

18. KMCC shall develop and submit to the Department a Disposal System Contingency Plan, pursuant to the schedule set forth in Appendix B. This Plan will set forth additional measures to be implemented to improve and upgrade the installed Disposal System, to correct the deficiencies identified in paragraph 17, above. The Plan will be set forth in Appendix J.

19. The chromium removed at the treatment facility shall be properly managed in accordance with applicable State or Federal regulations. The Treatment System and the Underground Disposal System may require Resource Conservation and Recovery Act (RCRA) permits. The Underground Disposal System may also require an Underground Injection Control (UIC) and/or a State groundwater discharge permit. If such permits are required, applications shall be filed by KMCC in sufficient time so as not to unreasonably delay the time for commencement of corrective action. The Department will cooperate with KMCC in obtaining any necessary permits for the Treatment or Underground Disposal Systems.

20. KMCC shall implement the safety plan set forth in Appendix K which is hereby incorporated into this Order.

21. The Department reserves the right to sample at its discretion, specific wells, influent, effluent, etc., for the purpose of oversight, quality assurance, and coordination with other investigations at the BMI Complex.

22. Subject to paragraph 27, below, KMCC may cease intercept, treatment and disposal activities when the concentration in the influent to the treatment system, of the compound having the Discharge Limit, does not exceed its Discharge Limit for a continuous period of three (3) months, based upon samples collected and analyzed pursuant to their respective sampling and analytical requirements. KMCC shall give notice to the Department when this

this Order is not met; $1,000 per day for each day that any of the construction, treatment or disposal deadlines in Appendix B are not met; $1,000 for each week the Discharge Limit is violated. Before invoking this provision, the Department shall issue an Order to Show Cause why KMCC is not liable for any stipulated penalty. Upon such issuance, KMCC shall have fifteen (15) days to show that failure was due to circumstances beyond KMCC's reasonable control. The Department and KMCC agree that these stipulated penalties are the sole and exclusive civil monetary penalty remedy of the Department for the violations covered by this paragraph 24.

25. The Department has determined that KMCC's compliance with the terms and conditions of this Consent Order constitutes full satisfaction of any and all claims the Department has against KMCC with respect to the chromium constituents identified in paragraph 11 pursuant to the Nevada Water Pollution Control Act and regulations, and the Nevada Hazardous Waste Disposal Act and regulations. Subject to KMCC compliance, the Department and its delegate agencies release KMCC from liability under the aforementioned statutes for chromium constituents and covenants not to sue or take any action against KMCC as to any civil liabilities or claims under these State statutes arising out of the presence of the inorganic identified in paragraph 11. This release specifically does not apply to any compound not identified in paragraph 11 and does not apply to the element identified in paragraph 11 when (a) the migration off-site occurs through a different channel than that being addressed by the intercept system provided for in this Order or (b) migration off-site occurred prior to the operation of the treatment system provided for in the Order.

26. No provision of this Order restricts KMCC's rights to administrative and judicial review pursuant to the Nevada Administrative Procedures Act, NRS

cessation will occur.

23. Any failure by KMCC to comply with the terms and conditions set forth in the Consent Order which is demonstrated by KMCC to be beyond KMCC's reasonable control, including obtaining of necessary local, State and Federal permits, obtaining access to property belonging to others, acts of God, fire, flood, windstorm, explosion, riot, war, sabotage and cause or causes beyond the reasonable control of KMCC, shall not be grounds for a finding of violation of this Consent Order and the time for performance herein shall be extended for the time period of such delay. If such circumstances prevent performance, such performance shall be excused unless and until circumstances so change that the performance is no longer prevented. Prompt notice of any delay shall be given by KMCC to the Department. As soon as possible after giving such notice, but in no event later than fifteen (15) days after becoming aware of such delay or prevention or anticipated delay or prevention, KMCC shall submit a written statement to the Department which fully describes the anticipated length and cause of such delay or prevention, the actions KMCC has taken and/or proposes to take to avoid or mitigate the impact of such a prevention and the proposed schedules for such action. KMCC shall use their best efforts to anticipate and minimize or avoid any delay or prevention of timely and complete performance of their obligations pursuant to this Consent Order. Increased costs or expenses associated with the implementation of actions called for by this Consent Order shall not, in any event, be a basis for changes in this Consent Order or extensions of time under this paragraph.

24. Upon failure by KMCC, except as provided in paragraph 23 above, to perform as set forth in this Order, KMCC shall pay a stipulated civil penalty of $100 per day for each day that a progress reporting deadline as listed in

233B.121 et. seq., of any Departmental final action or determination under this Order.

27. KMCC shall monitor wells within the zone of the intercept system, acceptable to the Department, for at least three (3) years after completion of intercept, treatment and disposal, to ensure that the cleanup has been completed as agreed and that the level in the wells remain below the level set forth in paragraph 11 above. Samples shall be taken and analyzed, quarterly, for the element having the Discharge Limit. If during the three-year monitoring period the limit is exceeded, KMCC shall again begin treatment. Treatment will continue until the limit is again achieved, and the wells will be monitored for the three-year period as specified above.

28. By agreeing to this Order, KMCC hereby unconditionally guarantees performance of its obligations under this Order. Consistent with Federal regulations, KMCC will affirm their financial capability to fulfill their obligation under this Order on an annual basis, if requested by the Department, using the most recent certified financial statements. If KMCC is no longer able to demonstrate financial capability by use of the Financial Test, KMCC agrees to demonstrate financial capability by use of one of the alternative mechanisms specified in the Federal regulations adopted pursuant to the Resource Conservation and Recovery Act (RCRA), such as a surety bond, letter of credit or trust fund, no later than sixty (60) days after a demand by the Department to so demonstrate.

29. Within thirty (30) days after the issuance of this Order, KMCC agrees to pay into the Nevada Fund for the Management of Hazardous Waste created by NRS 459.530, $10,000 for the future monitoring and other management activities associated with the site by the Department.

30. On or before the effective date of this Order, the Department and KMCC shall each designate a coordinator to administer this Order on behalf of the designator. KMCC shall record a copy of this Order with the Recorder of Clark County, Nevada.

31. This Consent Order supercedes and nullifies all other State Orders issued to KMCC regarding chromium contamination of the groundwater.

32. The Department shall not be liable for any injury or damages to persons or property resulting from KMCC's acts or omissions under this Order. Nor shall KMCC hold the Department out as a party to any contract entered into by KMCC to carry out this Order.

IN WITNESS WHEREOF, the Department and KMCC execute this Consent Order by their duly authorized representatives on this 9th day of September, 1986.

THE STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND
NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL
PROTECTION

By _____
Name: L.H. Dodgion
Title: Administrator

KERR-MCGEE CHEMICAL CORPORATION

By _____
Name: Rolfe B. Chase, Jr.
Title: Plant Manager

APPENDIX B

SCHEDULE OF IMPLEMENTATION

The following presents a schedule of implementation for the proposed groundwater mitigation program at the Henderson Facility with time for completion after approval by the Nevada DEP:

	Action Taken	Plan Approval
1.	Install four 6" interceptor wells along the intercept line and conduct pumping tests.	1 mo.
2.	Construct a test recharge trench and conduct a short-term reinjection/infiltration test.	3 mo.
3.	Complete further treatability studies on removal of chromium from the groundwater.	4 mo.
4.	Drill additional geological borings along the intercept line to define the subsurface features of the Muddy Creek Formation.	4 mo.
5.	Install other interceptor wells along the intercept line (the number of additional wells determined by 1 above).	7 mo.
6.	Submit to NDEP - Appendix E, Intercept System Contingency Plan	7 mo.
7.	Install upgradient and downgradient monitoring wells and collect initial or background samples.	7 mo.
8.	Complete construction of treatment facility.	10 mo.
9.	Submit to NDEP - Appendix H, Treatment System Contingency Plan.	11 mo.
10.	Complete construction of recharge trenches.	11 mo.
11.	Submit to NDEP - Appendix J, Disposal System Contingency Plan.	12 mo.
12.	Install permanent pump in interceptor wells and install all necessary piping.	12 mo.
13.	Start recovery program.*	12 mo.
14.	Interim Report on recovery program to Nevada Department of Environmental Protection.	13 mo.

*This assumes no RCRA or UIC permit is required. If a permit is required, the recovery program start will be delayed until such permit is received.

Appendix List

Appendix A - Map of Site

Plate 2: "Map Showing Chromium Distribution in the Near-Surface Aquifer in June/July, 1985, at the Henderson Facility," from Groundwater Mitigation Program, KMCC, Henderson, Nevada Facility Report dated October, 1985.

Appendix B - Schedule

Appendix C - Intercept System

Intercept System design described in Groundwater Mitigation Program, KMCC, Henderson Facility Report dated, 1985.

System design and additional data to be submitted 30 days after execution of the Consent Order.

Appendix D - Map of Water Level Monitoring Wells

To be submitted 30 days after execution of the Consent Order.

Appendix E - Intercept System Contingency Plan

To be submitted 7 months after execution of the Consent Order.

Appendix F - Chromium Treatment System Process Design

The chromium treatment system process design shall be submitted for review and approval prior to construction of the treatment system.

Appendix G - Sampling and Analysis Procedures and Protocols

The sampling and analysis procedures and protocols shall be submitted for review and approval by 45 days after execution of the Consent Order.

Appendix H - Treatment System Contingency Plan

The treatment system contingency plan shall be submitted within 11 months of the execution of the Consent Order.

Appendix I - Underground Disposal System

Final design of the underground system shall be submitted for review and approval within 45 days after the execution of the Consent Order.

Appendix J - Monitoring Wells and Contingency Plan for Disposal System

The contingency plan for the disposal system shall be submitted within 12 months after the execution of the Consent Order.

Appendix K - Safety Plan

The safety plan shall be submitted on completion of plant construction.

ADMINISTRATIVE ORDER ON CONSENT

This Administrative Order on Consent ("2005 AOC") is made and entered into on this 12th day of April 2005, by and between the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection ("NDEP" or "Division") and Kerr-McGee Chemical LLC, a Delaware Limited Liability Company ("Kerr-McGee"). Kerr-McGee and the Division are referred to collectively herein as the "Parties."

WHEREAS, the Parties entered a Consent Agreement in July 1999, to govern implementation of an expedited removal action addressing perchlorate in surface water in a seep adjacent to the Las Vegas Wash;

WHEREAS, the Parties entered into an administrative order on consent on October 8, 2001 ("2001 AOC"), to govern conduct of longer-term perchlorate cleanup activities to reduce the amount of perchlorate in ground and surface water reaching the Las Vegas Wash and Lake Mead;

WHEREAS, NDEP issued Kerr-McGee a five-year permit on August 7, 2000, for discharge of effluent from the perchlorate removal system, and this permit must now be renewed and modified, as appropriate, to take account of certain new developments, and Kerr McGee submitted an application to renew and amend this permit in February of 2005;

WHEREAS, pursuant to the 2001 AOC and as agreed by the Parties, as well as the Clean Water Act permit as amended in 2004, Kerr-McGee presently operates a biological treatment plant capable of treating 1000 gallons per minute of perchlorate containing water;

WHEREAS, Kerr-McGee historically operated a series of surface impoundments or ponds to manage perchlorate containing manufacturing process fluids, and Kerr-McGee, as part of its efforts to reduce the threat of further perchlorate releases to ground and surface water has been decommissioning these ponds, and a single perchlorate process pond ("AP-5") remains;

WHEREAS, NDEP and Kerr-McGee have agreed that the best means for sound disposition of perchlorate containing materials in AP-5 will be the processing of these materials

along with perchlorate contaminated groundwater in the biological treatment system constructed and operated at the Kerr-McGee site to fulfill the requirements of the 2001 AOC, but use of the biological treatment system for this purpose will require its expansion, and provision in Kerr-McGee's renewed Clean Water Act permit to allow discharge of effluent from treating pond contents in addition to treated ground and surface water, subject to the discharge limits as apply in an applicable permit;

NOW THEREFORE, in consideration of and in exchange for the mutual undertakings and covenants herein, intending to be legally bound hereby, the Division and Kerr-McGee agree as follows:

I. STATEMENT OF PURPOSE

The Division and Kerr-McGee are entering into this 2005 AOC to continue to document their respective rights and responsibilities during the ongoing conduct of a perchlorate removal action designed to reduce the amount of perchlorate in ground and surface water reaching the Las Vegas Wash and Lake Mead in both the near and long-term. The Division and Kerr-McGee are entering into this 2005 AOC to establish a compliance schedule for treatment of the perchlorate residues in AP-5 to avert any further threat of a release of perchlorate to the environment; to update and clarify Kerr-McGee's groundwater cleanup obligations to reflect certain changes agreed to by the Parties since entering the 2001 AOC; and to provide for continued reimbursement to the Division of Kerr-McGee's fair share of oversight costs incurred by the Division.

II. WORK TO BE PERFORMED

1. The Parties intend that the work to be performed in accordance with this 2005 AOC shall be carried out in a manner consistent with applicable federal and Nevada statutes, implementing regulations and the National Contingency Plan, 40 C.F.R. § 300.1 *et. seq.*

2. The following schedule shall apply to Kerr-McGee's obligation to complete decommissioning of AP-5:

A. By August of 2005 Kerr-McGee will complete pilot testing and preliminary engineering for an additional bioreactor to enable its existing biological treatment system to treat the contents of AP-5, subject to the discharge limits applicable to ground and surface water treated in the biological treatment system.

B. By August 2006 Kerr-McGee shall complete final engineering, detailed design and construction of the additional bioreactor and begin treatment of contents of AP-5.

C. By August 2006 Kerr-McGee shall complete the final engineering, detailed design, and construction of an enhanced solids recovery and management portion of the existing biological treatment system to provide for improved effluent clarity.

D. Within five years of initiation of treatment, Kerr-McGee shall complete decommissioning of AP-5.

E. Until completion of decommissioning of AP-5, Kerr-McGee shall continue to maintain AP-5 and its liner system in a manner to prevent release of perchlorate to groundwater.

3. Kerr-McGee shall continue to fulfill all its obligations under the AOC of October 8, 2001, except to the extent modified by subsequent agreement of the Parties and by this new AOC.

4. This 2005 AOC may be modified further to incorporate the remediation and reporting requirements of an on-going chromium groundwater contaminant remediation project.

III. STIPULATED PENALTIES

Unless there has been a written modification approved by NDEP, any failure by Kerr-McGee to meet a schedule deadline or otherwise carry out the work described in Section II may result in NDEP assessing stipulated penalties against Kerr-McGee. All penalty amounts are maximum amounts. Nothing in this 2005 AOC shall be construed to limit in any manner NDEP's discretion with respect to whether to take enforcement action or to assess less than the maximum penalty. Failure to commence, perform and/or complete work as described in Section

II in a manner acceptable to NDEP will result in the following penalties subject, however, to a cap of $250,000.

Period of Noncompliance	Maximum Penalty per Day
1st –7th day	$ 1,000
8th–21st day	$ 2,500
22nd day and thereafter	$ 5,000

The assessment of stipulated penalties shall not alter Kerr-McGee's obligation to comply with the terms of this 2005 AOC.

IV. DISPUTE RESOLUTION

1. The Parties shall use their best efforts informally and in good faith to resolve any dispute or differences of opinion. The Parties agree that the procedures contained in this Section are the sole and exclusive procedures for resolving disputes arising under this 2005 AOC. If Kerr-McGee fails to follow any of the requirements contained in this Section, then it shall have waived its right to further consideration of the dispute in issue.

2. If Kerr-McGee disagrees, in whole or in part, with any written determination by the Division pursuant to this 2005 AOC, Kerr-McGee shall notify the Division in writing of the dispute ("Notice of Dispute").

3. Any dispute that arises under or with respect to this 2005 AOC shall in the first instance be the subject of informal negotiations between the Parties. The period for informal negotiations shall not exceed ten (10) days following the date the dispute arises, unless such period is extended by written agreement of the Parties. The dispute shall be considered to have arisen when the Division receives a written Notice of Dispute.

4. In the event that the Parties cannot resolve a dispute by informal negotiations under the preceding paragraph, then the position advanced by the Division shall be considered binding unless, within ten (10) days after the conclusion of the informal negotiation period, Kerr-

McGee invokes the formal dispute resolution procedures of this Section by serving on the Division Administrator a written Statement of Position which shall set forth the specific points of the dispute, the position Kerr-McGee claims should be adopted as consistent with the requirements of this 2005 AOC, the basis for Kerr-McGee's position, any factual data, analysis or opinion supporting that position, any supporting documentation relied upon by Kerr-McGee, and any matters which it considers necessary for the Administrator's determination. The Statement of Position also may include a request for an opportunity to make an oral presentation of factual data, supporting documentation and expert testimony to the Administrator and to answer questions that the Administrator may pose. It is within the sole discretion of the Administrator to grant or deny a request for oral presentation.

5. Within fifteen (15) days following receipt of a Statement of Position, or after any oral presentation by Kerr-McGee, the Administrator shall issue his/her decision. The Administrator's written decision shall include a response to Kerr-McGee's arguments and evidence. The written decision of the Administrator shall be incorporated into and become an enforceable element of this 2005 AOC, and shall be considered the Division's final decision as provided in paragraph 6 of this Section.

6. As to any final Division decision, Kerr-McGee may, as appropriate, pursue the dispute before the State Environmental Commission ("SEC") as a "contested case" pursuant to NRS §§ 233B.010 *et seq.* and NAC §§ 445.988 – 445.995, and shall be entitled to both administrative and judicial review as provided therein.

V. FORCE MAJEURE

1. Kerr-McGee shall perform the requirements of this 2005 AOC within the time limits prescribed, unless the performance is prevented or delayed by events which constitute a *force majeure*. Kerr-McGee shall have the burden of proving such a *force majeure*. A *force majeure*, for purposes of this 2005 AOC, is defined as any event arising from causes not reasonably foreseeable and beyond the reasonable control of Kerr-McGee, or of any person or

entity controlled by Kerr-McGee, which delays or prevents the timely performance of any obligation under this Consent Agreement despite Kerr-McGee's best efforts to fulfill such obligation. A *force majeure* may include: extraordinary weather events, natural disasters, strikes and lockouts [by other than Kerr-McGee employees], national emergencies, delays in obtaining access or use of property not owned or controlled by Kerr-McGee despite timely best efforts to obtain such access or use approval, and delays in obtaining any required approval or permit from the Division or any other public agency that occur despite Kerr-McGee's complete, timely and appropriate submission of all information and documentation required for approval or applications for permits within a timeframe that would allow the work to proceed in a manner contemplated by the schedule of the 2005 AOC. A *force majeure* does not include (i) increased costs of the work to be performed under the 2005 AOC, (ii) financial inability to complete the work or (iii) normal precipitation events.

2. If any event occurs or has occurred that may delay the performance of Kerr-McGee's obligations under this 2005 AOC, whether or not caused by a *force majeure* event, Kerr-McGee shall notify the Division orally within two (2) business days of when Kerr-McGee first knew that the event might cause a delay. If Kerr-McGee wishes to claim a *force majeure* event, then within five (5) business days thereafter, Kerr-McGee shall provide to the Division a written explanation and description of the obligation(s) delayed or affected by the *force majeure* event; the reasons for the delay; the anticipated duration of the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Kerr-McGee's rationale for attributing such delay to a *force majeure* event; and a statement as to whether, in the opinion of Kerr-McGee, such event may cause or contribute to an imminent and substantial hazard to human health, welfare, or the environment. Kerr-McGee shall include with any notice all available documentation supporting its claim that the delay was attributable to a *force majeure*. Failure to comply with the above requirements shall preclude Kerr-McGee from asserting any claim of *force majeure* for that event.

3. The Division shall notify Kerr-McGee in writing of its *force majeure* determination within ten (10) days after receipt of the written notice from Kerr-McGee. If the Division determines that the delay has been or will be caused by circumstances constituting a *force majeure* event, the time for performance of the obligations under this 2005 AOC that are affected by the *force majeure* event will be extended by the Division in writing for such time as the Division determines is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation, unless Kerr-McGee can demonstrate to the Division's satisfaction that more than one obligation was affected by the *force majeure* event.

4. In the event that the Division and Kerr-McGee cannot agree that any delay or failure has been or will be caused by circumstances constituting a *force majeure*, or if there is no agreement on the length of the extension, the dispute shall be resolved in accordance with the dispute resolution provisions set forth in Section IV of this 2005 AOC.

VI. REPORTING REQUIREMENTS

1. Monthly Progress Reports – Until Kerr McGee begins operation of the proposed expanded biological treatment system to treat contents of AP-5, Kerr-McGee shall prepare and provide to NDEP written monthly Progress Reports which: (1) describe the actions which have been taken toward achieving compliance with Section II. 2. A. & B. of this 2005 AOC during the previous months, and (2) include information regarding percentage of completion, unresolved delays encountered, or anticipated delays that may affect the future schedule for implementation of the measures described in Section II. 2. A. & B., including a description of efforts made to mitigate these delays or anticipated delays. Such Progress Reports are to be submitted to NDEP by the 5th day of each month following the month for which the report covers.

2. Quarterly Progress Reports – Once Kerr-McGee begins operation of the expanded biological treatment plant, in lieu of the monthly reports described in Section VI.1., Kerr-McGee shall include a description of the operations of its AP-5 decommissioning operations in the

quarterly reports required by Section VI of the 2001 AOC. Such quarterly reports are due on the 28th day following each three month period of operation, but at its discretion NDEP may change the reporting interval to require only semi-annual reporting.

VII. REIMBURSEMENT OF OVERSIGHT COSTS

1. Kerr-McGee shall continue to reimburse the Division for costs reasonably incurred for the oversight of its perchlorate removal efforts.

2. The Division shall account for oversight costs associated with implementing this 2005 AOC and related work and shall submit to Kerr-McGee copies of all invoices on a quarterly basis, commencing with the first full calendar quarter after the effective date of this 2005 AOC. Submittals shall be made promptly after the Division's internal review. Such invoices shall contain sufficient detail to identify individual daily time entries and all invoices or costs details for administrative and vendor expenses (such as travel, training, equipment, photocopying expense and similar items). These invoices shall be prepared consistent with standard State billing practices and shall not require the creation of new billing practices. Amounts due hereunder shall be paid within thirty (30) days after receipt by Kerr-McGee of the invoices. Kerr-McGee may dispute particular invoiced costs if it determines that the Division has made an accounting error or if it alleges that the particular cost is not reimbursable pursuant to paragraph 3. In the event of such dispute, Kerr-McGee shall pay in a timely fashion undisputed costs. With respect to the disputed cost, Kerr-McGee may pay such amount under protest and without prejudice to recovery of all or any portion thereof at the conclusion of any dispute resolution timely commenced pursuant to Section IV.

3. All payments due by Kerr-McGee shall be by checks payable to the State of Nevada for the full amount due and owing to:

Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710
ATTENTION: Chief, Bureau of Corrective Actions

All checks shall reference the Site and Kerr-McGee's name and address.

VIII. RESERVATION OF RIGHTS

1. The Division reserves all of its statutory and regulatory powers, authorities, rights, and remedies, both legal and equitable, which may pertain to Kerr-McGee's failure to comply with any of the requirements of this 2005 AOC or of any requirement of federal or state laws, regulations, or permit conditions. Except as provided in Section IX (Other Claims: Covenant Not to Sue), this 2005 AOC shall not be construed as a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, and/or authorities, civil or criminal, which the Division has under any applicable statutory or common law authority of the State. This 2005 AOC in no way relieves Kerr-McGee of its responsibility to comply with any federal, state or local law or regulation.

2. The Division reserves the right to disapprove work performed by Kerr-McGee pursuant to this 2005AOC subject to Dispute Resolution under Section IV.

3. The Division reserves any and all legal rights and equitable remedies available to enforce (1) the provisions of this 2005 AOC, or (2) any applicable provision of state or federal law.

4. Kerr-McGee reserves all rights, claims and/or defenses it may have in any action brought or taken by the Division, the U.S. EPA or any third party pursuant to applicable law, with respect to the specific claims that can be asserted and further reserves the right to pursue potentially responsible parties to recover all costs incurred in the performance of this 2005 AOC.

5. Nothing in this 2005 AOC shall be construed as an admission of liability by Kerr-McGee.

IX. OTHER CLAIMS: COVENANT NOT TO SUE

Nothing in this 2005 AOC shall constitute or be construed as a release from, or covenant not to sue with respect to, any claim, cause of action, demand or defense in law or equity, against any person, firm, partnership, or corporation for, or in respect of any liability it may have arising

out of or relating to in any way to the generation, storage, treatment, handling, management, transportation, release, threatened release, or disposal of any perchlorate at or otherwise associated with the Site, except that the Division covenants not to sue Kerr-McGee with respect to perchlorate contamination at Henderson, Nevada so long as Kerr-McGee is in compliance with the terms of this 2005 AOC and the 2001 AOC.

X. APPLICABLE LAW

This 2005 AOC shall be construed in accordance with and governed by the law of the State of Nevada.

XI. EFFECTIVE DATE

This 2005 AOC shall become effective when it is fully executed by the parties. The effective date will be the date of last signature.

XII. MODIFICATION

This 2005 AOC may be modified or amended only upon the mutual agreement of the Parties. Any modification or amendment shall be in writing, shall be signed by the Parties and shall have an effective date commencing on the date it is signed by the Division, unless otherwise stated.

XIII. TERMINATION

This 2005 AOC shall terminate upon the occurrence of any of the following events:

1. Any agency or department of the United States government asserts and undertakes lead responsibility for addressing perchlorate contamination at Henderson.

2. The Division, Kerr-McGee and any other Party(ies) enter a new order or agreement to govern long-term remedial action with respect to perchlorate contamination and/or other contamination in groundwater at Henderson, and this later agreement expressly supersedes the 2001 AOC and the 2005 AOC.

3. Upon application by Kerr-McGee for termination of this 2005 AOC, Kerr-McGee demonstrates to the satisfaction of the Division that response activities have reduced perchlorate

concentrations in the Henderson groundwater to a point that continued operation of the treatment system is unlikely to result in further measurable benefit to water quality in the Las Vegas Wash or Lake Mead.

XIV. SIGNATORIES

Each undersigned individual represents and warrants that he or she is fully authorized by the party he or she represents to enter into this 2005 AOC and to legally bind such party to the terms and conditions of this 2005 AOC.

IN WITNESS WHEREOF, the Division and Kerr-McGee execute this 2005 AOC by their duly authorized representatives on this 12th day of April, 2005.

THE STATE OF NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

By: _____

Name: Leo Drozdoff

Title: Administrator

KERR-McGEE CHEMICAL LLC

By: _____

Name: George D. Christiansen

Title: Vice President

APPROVED AS TO FORM this 12th day of April, 2005.

BRIAN SANDOVAL
Attorney General

By: _____

WILLIAM FREY
Senior Deputy Attorney General
Nevada Bar No. 4266
100 N. Carson St.
Carson City, NV 89701
775-684-1229

Attachment B

Signature Pages
For Executing Changes in the
1986 Consent Order and the
2005 Administrative Order on Consent

Modification of **1986 Consent Order**

This document modifies the Consent Order, dated September 9, 1986, between the Nevada Division of Environmental Protection (Division) and Tronox LLC, (Tronox), formerly Kerr-McGee Chemical LLC. It extends the performance report due date. The modification is needed to include analytical from the last month of the reporting period as well as to harmonize and wed the formats of several performance reports, so that reports for several remedial project can be combined.

The following language will be added as a separate paragraph at the end of Paragraph 12 of the Consent Order:

"Performance reports will be submitted to NDEP on a semi-annual basis within 60 days of June 30th and December 31st each year."

All terms and conditions of the Consent Order shall remain in full force and effect.

In witness whereof, the Division and Tronox execute this modification by their duly authorized representatives on this _____ day of January, 2007.

THE STATE OF NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

By:_____
Name: Leo Drozdoff
Title: Administrator
Date: _____

TRONOX LLC

By:_____
Name: Patrick S. Corbett
Title: Vice President
Date: _____

Modification of 2005 Administrative Order on Consent

This document modifies the Administrative Order on Consent, dated April 12, 2005, between the Nevada Division of Environmental Protection (Division) and Tronox LLC (Tronox LLC (Tronox), formerly known as Kerr-McGee Chemical LLC. It extends the performance report due date. The modification is needed to include analytical from the last month of the reporting period as well as to harmonize and wed the formats of several performance report, so that reports for several remedial project can be combined.

The modified AOC language is as follows:

> Page 7 and 8: Section VI – 2. Quarterly Progress Reports – once Kerr-McGee begins operation of the expanded biological treatment plant, in lieu of the monthly described in Section VI.1., Kerr-McGee shall include a description of the operations of it's AP-5 decommissioning operations in the quarterly reports required by Section VI of the 2001 AOC. Such reports are due 60 days following each three month period of operation, but at it's discretion NDEP may change the reporting interval to require only semi-annual reporting.

All other terms and conditions of the AOC shall remain in full force and effect.

In witness whereof, the Division and Tronox execute this modification by their duly authorized representatives on this _____ day of January, 2007.

THE STATE OF NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

By:_____
Name: Leo Drozdoff
Title: Administrator
Date: _____

TRONOX LLC

By:_____
Name: Patrick S. Corbett
Title: Vice President
Date: _____

TRONOX

Susan Crowley
Staff Environmental Specialist

(702) 651-2234
Fax (405) 302-4607
susan.crowley@tronox.com

January 11, 2007

Todd Croft
Nevada Division of Environmental Protection
1771 East Flamingo Road, Suite 121-A
Las Vegas, NV 89119

Subject: Perchlorate Remediation – Updated 2006 Regional Maps and Plates

Dear Mr. Croft:

Tronox LLC has updated several Plates and one Figure that have in the past been used for reference during discussions relating to perchlorate remediation efforts in Henderson NV. This updated information (4 hard copies) is attached for your use. An electronic copy will follow under separate cover.

Please feel free to contact me at (702) 651-2234 if you have any questions relating to this information. Thank you.

Sincerely,

Susan Crowley, CEM 1428 exp 3-8-07
Staff Environmental Specialist

Overnight Mail

Cc: Please see attached distribution sheet

Tronox Document Distribution List

Updated: 17-Oct-06

Document Name: Perchlorate Project General Docs *

* If docs are small then e-versions will not be produced and all will be distributed a hard copy

Name (Last, First)		Firm	Distribution		
			Hard	e-Copy	Cvr Only
Croft	Todd	NDEP	2	2	
King	Val	NDEP			
Najima	Jim	NDEP	X	X	
Rakvica	Brian	NDEP	X	X	
Sous	Nadir	NDEP			
Tinney	Al	NDEP		X	
Palm	Jon	NDEP			
Pohlmann	Brenda	COH		X	
Conaty	Barry	COH Counsel		X	
Durr	Paul	DAQEM			
Hunsaker	Ross	DAQEM			
Beckstead	Richard	DAQEM			
Jorgenson	Carolyn	DAQEM Counsel			
Mrowka	Rob	CCCP	X	X	
Liang	Sun	MWD	X	X	
Mulroy	Pat	SNWA	X	X	
Goff	Mike	SNWA			
Liesing	Joe	SNWA		X	
Kaplan	Mitch	EPA, Reg 9	X	X	
Compliance Corrdonator		NDEP			
Compliance Coordinator		DAQEM			
Public Repository		Library	X	X	

Name (Last, First)		Firm	Distribution		
			Hard	e-Copy	Cvr Only
Bailey	Keith	Tronox	X	X	
Corbett	Pat	Tronox		X	
Elmer	Dana	Tronox			
Hatmaker	John	Tronox		X	
Reed	Tom	Tronox	X	X	
Ellington	Toni	Tronox Counsel		X	
Stater	Rick	Tronox		X	
Crowley	Susan	Tronox	2	2	
Krish	Ed	ENSR	X	X	
Bilodeau	Sally	ENSR	X	X	
Gerry	Dave	ENSR		X	
Lambeth	Jeff	Veolia		X	
McDaniel	Tom	Veolia		X	
Cheung	Mary	Veolia		X	
Guerriero	Joe	AIG		X	
Giroux	Barry	GEI		X	
Stowers	Kirk	Broadbent			
Quillian	Jill	ERM			
Sahu	Rahnijit	BMI		X	
Crouse	George	Syngenta			
Erickson	Lee	Stauffer			
Kelly	Joe	Montrose			
Sundberg	Paul	Montrose		X	
Gibson	Jeff	AmPac			
Sylvia	Chris	Pioneer			
Wilkinson	Craig	Timet		X	
Mack	Joel	Montrose Counsel			

01/05/07
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PE.com
THE PRESS-ENTERPRISE

Inland News

Bill targets perchlorate in water

ROCKET FUEL: It would set limits for the chemical in drinking supplies and require testing to detect it.

10:00 PM PST on Thursday, January 4, 2007

By DAVID DANELSKI
The Press-Enterprise

On the first day in 12 years that Democrats have controlled Congress, California Sens. Barbara Boxer and Dianne Feinstein chose to take on the U.S. Environmental Protection Agency by introducing bills to set standards on a rocket fuel chemical fouling water supplies nationwide.

The EPA has not regulated the chemical, perchlorate, and decided last month not to require testing of water supplies to detect it.

Boxer and Feinstein introduced two bills on Thursday that would require tests and regulation.

Perchlorate has tainted water supplies in Rialto, Colton, Glen Avon, Redlands, San Bernardino and other Inland communities, prompting water agencies to remove the contamination or rely on other sources for drinking water.

The chemical is used in rocket fuel, munitions, fireworks and other explosives, and is found in some fertilizers. In sufficient doses, perchlorate can impair the thyroid gland's ability to make hormones that regulate metabolism and guide brain and nerve development in fetuses and babies.

Lockheed Martin Corp., which operated a rocket factory east of Redlands, is one of the companies blamed for contaminating Inland water. Company spokeswoman Gail Rymer said she hasn't the seen the proposed legislation. She said the company has been removing the chemical from wells used by Riverside, Redlands and Loma Linda.

Industry and military scientists say that the trace amounts in drinking water are harmless, a view challenged by Boxer and Feinstein, both Democrats.

"Serious questions have been raised about the health risks of perchlorate-contaminated water, particularly for pregnant women and children," Feinstein said in a statement

One of two bills they introduced would require the EPA to warn the public about perchlorate health

hazards and set a limit for the chemical in drinking water. The second bill would require drinking water to be tested for perchlorate and mandate public notice if the chemical is found. Water agencies in California already are required to test for the chemical, and the state is expected to set a drinking water limit soon.

Jan Marquis, an Inland environmentalist, said the Boxer-Feinstein bills have a chance of becoming law now that Democrats control Congress and Boxer is chairwoman of the Senate committee on the environment.

New environmental regulations most often were opposed by the Bush administration and its Republican supporters in Congress, said Marquis, policy director of the Center for Community Action and Environmental Justice, based in Glen Avon.

The EPA ignited controversy when it relied on defense industry-sponsored studies in 2005 to determine that perchlorate levels below 24.5 parts per billion in drinking water were safe. The number was based primarily on a study of 37 healthy adults who ingested the chemical for two weeks. Most contaminated drinking-water supplies in the Inland area have concentrations lower than 24.5 parts per billion.

However, the federal Centers for Disease Control and Prevention in Atlanta found that women with low iodine levels could be affected by perchlorate concentrations commonly found in water and food - concentrations far less than 24.5 parts per billion.The October study of more than 2,000 people also found that about a third of U.S. women have low iodine levels.

TRONOX

Susan Crowley
Staff Environmental Specialist

(702) 651-2234
Fax (405) 302-4607
susan.crowley@tronox.com

January 2, 2007

Ms. Lisa Fleming
Nevada Division of Environmental Protection
901 South Stewart Street, Suite 4001
Carson City, NV 89701

Subject: Reimbursement of NDEP for ECA Activities Costs – 3rd Quarter 2006 – Billing # 34

Dear Ms. Fleming:

Tronox LLC, Tronox, has agreed to reimburse Nevada Division of Environmental Protection, NDEP, for oversight costs associated with the environmental conditions investigation associated with the Tronox Henderson area facility. Please find attached a check for $2,336.88 to cover Tronox's reimbursement of NDEP for costs incurred during July 1, 2006 to September 30, 2006 (billing #34). A copy of NDEP's cost summary is attached for your reference.

Please feel free to call me if you have any questions regarding this correspondence. Thank you.

Sincerely,

Susan Crowley
Staff Environmental Specialist

Certified Mail

Cc: Pat Crowley
Jerry Clyne, w/o attachment
Dana Elmer, w/o attachment
Brian Rakvica, w/o attachment

Attachment