

Appendix A
NDEP Correspondence

LEO DROZDOFF, *Administrator*

(775) 687-4670

Administration
Facsimile 687-5856

Water Quality Planning
Water Pollution Control
Facsimile 687-4684

Mining Regulations and Reclamation
Facsimile 684-5259

Las Vegas Office
Facsimile (702) 486-2863

STATE OF NEVADA
KENNY C. GUINN
Governor



ALLEN BIAGGI, *Director*

Air Pollution Control
Air Quality Planning
Facsimile 687-6396

Waste Management
Facsimile 687-6396

Corrective Actions
Facsimile 687-8335

Federal Facilities
Facsimile (702) 486-2863

Webpage <http://ndep.nv.gov>

OCT - 6 2005

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION

Las Vegas Office

1771 East Flamingo Road, Suite 121-A

Las Vegas, Nevada 89119-0837

(702) 486-2850

October 3, 2005

Ms. Susan Crowley
Kerr-McGee Chemical LLC
PO Box 55
Henderson, Nevada 89009

Re: **Kerr-McGee Chemical Corporation LLC (KM)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection Response to:
Source Area Evaluation Work Plan Conceptual Approach
dated September 30, 2005

Dear Ms. Crowley,

The NDEP has received and reviewed KM's letter identified above and provides comments below.

1. The NDEP agrees with KM's approach, in concept. Please note that the NDEP may have comments on the individual work plans as they are submitted.
2. Phase A, please note that the NDEP may request that additional borings be completed as part of this round of investigation. KM proposes to screen some chemicals from future analysis between Phases A and B. The NDEP agrees with this approach (in concept), however, KM should note that the NDEP reserves the right to request additional analysis in the future. These requests may be due to the discovery of new or additional information; refinement of the site-wide conceptual site model; findings on an adjacent property or for other reasons not contemplated herein.
3. Phase B, KM should also consider developing cross-sections upgradient of the Unit Buildings and at the northern property boundary.

The NDEP requests that these issues be considered in the development of the future work plans. Please provide a schedule for the submittals of the Phase A Investigation Work Plan

Ms. Susan Crowley

10/3/2005

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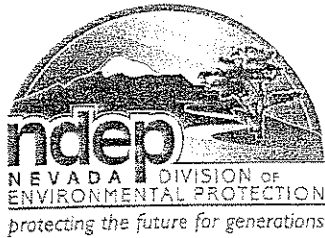
by **October 21, 2005**. If there is anything further or if there are any questions please do not hesitate to contact me.

Sincerely,



Brian A. Rakvica, P.E.
Staff Engineer II
Bureau of Corrective Actions
NDEP-Las Vegas Office

CC: Jim Najima, NDEP, BCA, Carson City
Jeff Johnson, NDEP, BCA, Carson City
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, BEC, 875 West Warm Springs Road, Henderson, Nevada 89015
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
Mr. George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Mr. Lee Erickson, Stauffer Management Company, 1800 Concord Pike, Hanby 1, Wilmington,
DE 19850-5437
Mr. Chris Sylvia, Pioneer Americas LLC, PO Box 86, Henderson, Nevada 89009
Mr. 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



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

Kenny C. Guinn, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

March 11, 2006

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 A Source Area Investigation Work Plan
dated February 2006

Dear Ms. Crowley,

The NDEP has received and reviewed Trx's letter identified above and provides comments in Attachment A.

These comments should be addressed in a meeting or telephone call for expediency. Please provide a revised submittal following resolution of the comments. If there are any questions please do not hesitate to contact me.

Sincerely,

Brian A. Rakvica, P.E.
Supervisor, Special Projects Branch
Bureau of Corrective Actions
NDEP-Las Vegas Office



Ms. Susan Crowley

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CC: Jim Najima, NDEP, BCA, Carson City
Jeff Johnson, 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
Ranjit Sahu, BEC, 311 North Story Place, Alhambra, CA 91801
Richard Kellogg, BRC, 875 West Warm Springs Road, Henderson, NV 89015
Keith Bailey, Tronox, PO Box 268859, Oklahoma City, Oklahoma 73126-8859
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
Lee Erickson, Stauffer Management Company, 400 Ridge Rd., Golden, CO 80403
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. It appears that the tone and purpose of the work plan has evolved. Based on the September 30, 2005 letter from Kerr-McGee to the NDEP the purpose of the Phase A work plan was as follows: “to determine how many of the site-related chemicals (SRCs) are actually present on-site and to *start* the screening process to select SRCs applicable to future sampling efforts and *support* the selection of chemicals of potential concern (COPCs).” Please note that bolding, and italicizing have been added for emphasis (above and below). In the February 2006 work plan, executive summary, page ES-1, Trx states “The activities covered by this work plan...is intended to evaluate the presence or absence of site-related chemicals (SRCs) in areas of highest potential impacts. Further it is intended to support the selection of constituents of potential concern (COPC).” Section 1.0, page 1-1 goes on to stated “this investigation is to assess which SRCs are present or absent at the Site and to identify which of the SRCs would be applicable in future sampling efforts.” The NDEP would like to provide the following clarification regarding it’s understanding:
 - a. Data will be collected in such a manner that it is useful for the selection of COPC selection, however, this work plan *alone* will not support the selection of COPCs.
 - b. Additional characterization of the site based on the SRC list may be required after Phase A.
 - c. Eight borings and three monitoring wells are not likely to be sufficient to support COPC selection. Additional discussion between the NDEP’s risk assessment team and Trx’s risk assessment team is likely warranted.
 - d. Additional investigation in the soils below the water table and groundwater in the deeper zones of the Muddy creek Formation are likely to be necessary.
2. Executive Summary, page ES-1, the same text is repeated twice in the section starting with the words “The activities covered by this work plan...” In the future, please complete a more rigorous QA/QC process prior to submittal.
3. Section 3.1, page 3-1, the NDEP has the following comments:
 - a. Without lithologic cross-sections (showing water table elevations as well as lithologic details) it is not possible for the NDEP to determine if the proposed sampling intervals are adequate. It is suggested that samples be taken every 10’ to the water table.
 - b. The NDEP is not opposed to groundwater samples being taken from the east and west interceptor well galleries, however, it should be noted that this procedure will mask the high and low concentrations within each well. It is likely that this data will not be useful for COPC selection. Trx may need to consider installation of additional groundwater monitoring wells on the plant site area once the results of the soil analysis are complete.
4. Section 3.3, page 3-3, please note that PCBs are not pesticides.
5. Section 3.3, page 3-3, Trx states “it is anticipated that once the soil and groundwater data are developed, many SRCs and portions of the associated broad suite constituent analysis can be eliminated from future sampling programs.” As stated above, the NDEP does not concur.

6. Table 3, please note that the NDEP does not warrant the applicability of the information presented on this table as it is the responsibility of the project CEM.
 - a. Please note that asbestos appears to be missing from this table.
 - b. Ethylene glycol could be combined with the "Fuel Alcohols" line item
 - c. The listing of metals is incomplete versus the presentation on Table 4. For example, silicon, tin, thallium, etc.
7. Tables 4 and 7, it was the NDEP's understanding that this table represents the full list of analytes related to the SRC list. If not, Trx should develop a supplemental list of SRCs that are not proposed for analysis (with justification) and provide this to the NDEP. It is not clear to the NDEP what is intended.
 - a. Radionuclides that are proposed to be back quantitated are not presented.
 - b. Please discuss if asbestos is proposed to be addressed by the elutriator method or an alternative method.
 - c. It is noted that semi-volatile organic compound (SVOC) analysis is proposed but polycyclic aromatic hydrocarbon (PAH) analysis is not. It is noted that the SVOC analysis will not provide adequate detection limits, please include PAH analysis.
 - d. Please note that there are some sorting errors on table 4 with regards to alphabetical order.
 - e. It has been reported by others that 1,4-dioxane can be analyzed and detected at a sufficiently low level via method 8270 analysis. Please discuss this issue with your laboratories and add 1,4-dioxane to the list of analytes, if appropriate.
 - f. Table 4, chlorobenzol (as listed on the SRC list, and monochlorobenzene as duplicated on the SRC list) appears to be missing from this table. Please verify that the compound names listed on the SRC list are consistently used in future documents. If synonyms are used a cross-reference should be included. For example, methyl isobutyl ketone and orthodichlorobenzene.
 - g. It appears that some of the questions regarding methodology that were evident in the SRC list have been addressed. The NDEP requests that an updated SRC List be provided under separate cover.
8. Table 5, the NDEP has the following comments:
 - a. None of the superscripts on this table are defined.
9. Table 6, please note that the NDEP does not warrant the applicability of the information presented on this table as it is the responsibility of the project CEM.
10. Plate 1, the NDEP has the following comments:
 - a. Based on Plate 6 of the Trx Conceptual Site Model (CSM) dated February 2005, it appears that boring SA-1 should be located further north. In addition, based on the number of letter of understanding (LOU) areas in the vicinity, it appears that a boring is warranted on the north side of each unit building (units 1 through 6). The specific location of each of these borings should be coordinated between Plate 6 of the CSM and site knowledge.
 - b. It would be helpful if the LOU areas from Plate 6 of the CSM were shown on this figure.

- c. It is the belief of the NDEP that additional borings are warranted to address the former manganese tailings area, LOU #34, various locations.
- d. It is the belief of the NDEP that additional borings are warranted to address ponds C-1 and Mn-1, LOUs #20 and 21, respectively. It is suggested that an additional boring be placed downgradient of these ponds.
- e. It is the belief of the NDEP that additional borings are warranted to address ponds AP-1, AP-2, AP-3, and AP-4, LOUs #16, 17 and 18.
- f. It is the belief of the NDEP that additional borings are warranted to address ponds WC-1 and WC-2, LOUs # 22 and 23, respectively.
- g. It is the belief of the NDEP that additional borings are warranted to address the historic trade effluent settling ponds, LOU #1. It is suggested that a boring be placed downgradient of existing pond GW-11.
- h. It is the belief of the NDEP that additional borings are warranted to address ponds P-2 and S-1, LOUs #9 and 13, respectively.
- i. It is the belief of the NDEP that additional borings are warranted to address the historic hazardous waste landfill, LOU #10.
- j. It is the belief of the NDEP that additional borings are warranted to address the Beta Ditch, Northwest Drainage Ditch and Mystery Ditch.
- k. It is likely that additional borings are warranted in the future to address other LOU areas, potential source areas and deeper soils (below the water table).
- l. Per the NDEP's previous comments on the *Upgradient Work Plan*, the NDEP requests that samples be collected in the storm ditch upgradient of the plant site area.

NDEP Response to Tronox (Trx) ECA Concept

1. Trx email dated May 1, 2006, the NDEP has the following comments:
 - a. Trx states *"The attached file contains our understanding of the ECA concept we discussed in recent meetings. We have incorporated your request that in determining which analytes may not require additional characterization, a multiplier of 0.1 should be used on non-cancer related industrial PRGs. Your e-mail this morning indicated the similar treatment should be used on cancer related industrial PRGs. Our understanding is that EPA guidance to both Regions 3 and 4 specifically requires the 0.1 factor on non-cancer PRGs, but not on cancer related PRGs."* The NDEP reiterates, like the non-cancer hazard index, the incremental lifetime cancer risk is also an additive/cumulative risk characterization parameter. See USEPA Region 9 PRGs (USEPA 2004, p. 14-16) as well as RAGS (USEPA, 1989, p. 8-16).
 - b. Trx states *"The baseline risk assessment process can be made more efficient by focusing on dominant contaminants and routes of exposure at the earliest feasible stage. The mechanisms recommended for this are (1) a reordering of the process of eliminating contaminants and routes of exposure, and (2) use of a risk-based concentration screen. Appropriately used, this process can dramatically reduce the effort of risk assessment, while not changing the result significantly. A table of risk-based concentrations is provided "which correspond to a systemic hazard quotient of 0.1 or a lifetime cancer risk of 10⁻⁶"* The NDEP would like to note that the quote that Trx has provided refers to the baseline risk assessment process and COPC selection for risk assessment, not the site characterization process.
 - c. Trx states *"The Region 3 RBC screening values for non-carcinogenic chemicals need to be adjusted to a level equivalent to a HQ of 0.1 before being used to select COPCs. Tronox is concerned that multiplying cancer-related PRGs by 0.1 will result in levels below analytical method limits. We have retained the concept language including the 0.1 factor only for non-cancer analytes until we can further discuss the issue with you."* The NDEP would like to note that incremental lifetime cancer risk characterization is based on the cumulative risk from all carcinogens (USEPA, 1989). Current analytical methods are adequate to support a multi-chemical toxicity/exposure screen based on one-tenth the PRG concentration. If Trx has specific issues, the NDEP will address these on a case-by-case basis. If site-specific data can support the use of an alternative multiple chemical factor, then a site-specific alternative multiple chemical factor can be proposed. An alternative multiple factor should be supported by data that document that no more than 3-4 carcinogens will contribute to risk. Such a conclusion must be based on a complete site characterization.

2. As NDEP has repeatedly stated, it is not evident that any costs savings will be realized unless an entire analytical method can be removed from the investigation. NDEP has asked Trx to perform a critical review of this issue and discuss it with the NDEP. Completion of this item may greatly uncomplicate the issues presented in the conceptual approach. In the April 11, 2006 meeting the NDEP stated "*NDEP inquired as to what analyses Trx thought would drop off through a screening and what cost savings could be realized. For example, if select VOC and SVOCs were screened out the cost savings might be zero or negligible.*" NDEP requested (in a May 2, 2006 phone call) that Trx identify the costs associated with the analyses so that these can be discussed in detail at the May 16, 2006 meeting. Until this issue is resolved it is not clear to the NDEP that time and resources are being well spent on this conceptual approach.
3. Exposure areas should be defined prior to initiation of this sampling and analysis plan as this affects data adequacy calculations.
4. The plan must account for an evaluation of data adequacy (as part of Step 2) and additional investigation/iteration (as needed due to inadequate data collected in Step 1) as part of Trx's plan.
5. The final plan should discuss the selection of the sampling locations and depths. This information should be tied to the CSM, process knowledge, fate and transport issues, etc. The basis for these sample locations and the justification for why Trx believes that this is a representative number of samples must be transparent in the final plan.
6. The NDEP can not and will not agree to any pre-determined number of sampling locations as this presupposes a level of adequacy. Trx is asking the NDEP to agree to decisions that are not supportable or technically defensible.
7. Trx should identify innovative means of identifying site-related chemicals and propose field screening methods to the NDEP to reduce project costs. To date, Trx has not suggested any such cost-saving measures. For example, immunoassays for dioxin/furans have been discussed on a number of occasions.
8. The NDEP has issued comments and voiced concerns on issues that do not appear to be addressed by the conceptual work plan. Examples are provided below.
 - a. Per the meeting minutes dated April 27, 2006, the NDEP stated in item 2.h. "*NDEP noted a concern that this sounded like COPC selection. NDEP to discuss internally.*"
 - b. Additionally, in an NDEP email dated May 1, 2006, the NDEP noted that "*Cancer PRGs should also be looked at 1/10 of their face value*". Multiple risk assessors, under contract with the NDEP, have independently concurred that this approach is sound. Additional guidance is provided above.
 - c. The NDEP had previously provided comments regarding the proposed groundwater sampling locations. This revised work plan appears to

- completely disregard groundwater. Some contaminants may no longer be present in soil and may only be present in groundwater. Some contaminants previously detected had their highest concentrations at the soil/groundwater interface. Trx should consider a comprehensive sampling event for groundwater as well.
9. The NDEP noted in the April 11, 2006 meeting that Trx should “review the wet chemistry analyses and determine if the NDEP Certification Program is driving the various methods that are proposed. NDEP requests a summary of this and what solution Trx would propose.” NDEP has reiterated this and noted on May 2, 2006 that Trx should be prepared to discuss this at the May 16, 2006 meeting.
 10. Trx should note the following:
 - a. It is the belief of the NDEP that COPC selection can not occur until site characterization is complete.
 - b. Trx can and should perform a phased RI/FS. Once a site-related chemical is fully delineated (e.g.: organophosphate pesticides) it can be removed from further investigation. Additional data or field observations may necessitate analysis in the future. This is consistent with the NDEP’s letter dated October 3, 2005 which stated “KM should note that the NDEP reserves the right to request additional analysis in the future. These requests may be due to the discovery of new or additional information; refinement of the site-wide conceptual site model; findings on an adjacent property or for other reasons not contemplated herein.”
 - c. Trx should evaluate the depositional patterns of certain compounds versus site activities. If these items are known Trx should propose sampling that is commensurate with the level of understanding. As the level of understanding decreases the number of samples needed should increase. For example, asbestos and dioxin/furans. NDEP stated this in the April 11, 2006 meeting with Trx as follows: “NDEP noted that Trx should review the depositional patterns that could be historically expected at the site and apply this to the sampling scheme. This could result in significant cost savings.”
 - d. If initial characterization is documented to adequately characterize the source locations, and the CSM supports the assumption that concentrations of source-related chemicals decrease with distance from the source, then further characterization may not be warranted (address CSM, migration, etc.). In such cases, the conservative assumption must be made that concentrations within an entire exposure area (including locations away from the source) are equal to those at the source. This approach may be cost-effective if risks associated with the source location concentrations are *de minimis*.
 11. Trx references the USEPA case study dated February 2006 entitled “Systematic Planning: A Case Study for Hazardous Waste Site Investigations”. Trx is suggesting that this case study supports the selection of COPCs after the preliminary investigation. Primary differences are noted below:
 - a. The case study site is approximately 25 acres. The Trx site is over 450 acres.

- b. The case study site had known and limited uses. The Trx site has some unknown uses and has had a variety of processes through time. Additionally, the Trx site is likely impacted by the neighboring sites which are equally complex.
 - c. The case study site completed the DQO process. The Trx site has not completed the DQO process.
 - d. The case study site has a limited suite of contaminants and proposed to use a field screening technique to limit costs. The Trx site has neither.
 - e. The case study site proposes 65 sample locations for the first round of sampling over 25 acres. Assuming 450 acres and applying this density the Trx site would require approximately 1,170 samples locations for the first round.
12. Step 1, the NDEP has the following comments:
- a. Following early phases of site characterization, subsequent data needs are determined, at least in part, by the results of the early investigations. Decisions regarding how much data are needed for site characterization cannot be finalized prior to those analyses.
 - b. In order to eliminate compounds, Trx must show that these chemicals have been adequately characterized with the existing data. Determination of adequacy is dependent upon CSM, spatial distribution relative to source and receptor locations, risk benchmark concentrations versus concentrations reported thus far, and migration potential issues. Additionally, this does not replace the need for complete COPC screening prior to initiation of any risk assessment.
 - c. The NDEP can not agree that 23-25 samples will be sufficient. This decision will be made once the data are received and reviewed.
13. Step 2, the NDEP has the following comments:
- a. As the NDEP has noted previously, what is proposed in this section of the document is a modified methodology for identifying Chemicals of Potential Concern (COPCs) for health risk assessment (HRA). COPC identification for HRA is conducted after site characterization is complete (i.e., nature and extent have been delineated [USEPA, 1988, 1989]). If COPCs are identified based on incomplete site characterization, exposure and risk may be underestimated (USEPA, 1989, 1992).
 - b. The quote from the USEPA *Guidance for Data Usability in Risk Assessment* (USEPA, 1992) is taken out of context. Section 3.2.1 of that document discusses *potential* COPCs, which is all that can be identified prior to completion of site characterization. The concern that USEPA raises is the potential to miss characterizing some COPCs (see first bullet p. 41: “To protect human health, place a higher priority on preventing false negatives in sampling and analysis than on preventing false positives”). Regarding the second bullet on p. 41 (“Use preliminary data to identify chemicals of potential concern and to determine any need to modify the sampling or analytical design”), USEPA makes the statement to emphasize that preliminary information and data should be used to ensure that data are collected for all potential COPCs. The statement is

not intended to imply that risk assessment COPCs can be effectively identified or eliminated prior to completion of site characterization.

- c. USEPA, 1992 is a supplemental guidance to RAGS (USEPA, 1989). RAGS and the primary USEPA guidance for site characterization that is cited in RAGS (USEPA, 1988) provide specific guidance (not provided in USEPA, 1992) regarding characterization of sources and nature and extent, as well as COPC selection. These guidance documents identify the following data collection objectives: definition of source areas of contamination, the potential pathways of migration, and the potential receptors and associated exposure pathways to the extent necessary to (1) determine the potential risk to human health and the environment and (2) develop and evaluate remedial alternatives.
 - d. The proposed approach does not explain how the identification of “chemicals that are likely to drive the risk and possible remedial action” would be conducted.
 - e. Further discussion on the Frequency of Detection criteria will not be appropriate until the issue of data adequacy is resolved.
 - f. Trx notes that chemicals “present at concentrations less than naturally-occurring or upgradient concentrations will be considered for elimination from the analytical list for future investigations.” The NDEP cautions Trx that naturally-occurring and upgradient conditions have not yet been established or approved by the NDEP. In addition, Trx has not defined the upgradient extent of the site’s influence. Additionally, it does not make sense to eliminate compounds from analytical lists unless a meaningful cost savings can be achieved. This is related to the NDEP’s comment above.
14. Steps 4 through 6 are not applicable to a document titled “Concept for Tronox Henderson Site Source Area Investigation.”

NDEP Comments on Phase A Work Plan Concept from 6/15/06 Meeting

1. General – please note that the NDEP has not verified method numbers and does not warrant the applicability of method detection limits.
2. General – please note that the specific list of analytes will be verified in the final submittal.
3. General – updates and additional detail to be provided as discussed in meeting on 6/15/06.
4. General – there should be discussion in the text that explains how Trx got from Table 1 to Table 3. This should specifically note that due to “unknowns” the broad suite analyses provided in Table 3 is proposed.
5. Radionuclides -please note that the data should be compared versus the BRC/TIMET background data set as well to confirm correlations.
6. SVOCs – please note that Trx will need to verify that the non-SIM method can provide sufficient detection limits for all future uses.
7. Dioxins/furans – typically, there is a need to split approximately 10% and analyze by both methods. There is also some calibrating the 4025 method after an initial GC/MS set of analyses. Also, if there are different sources of dioxin/furans you need to first characterize the dioxin/furan species with GC/MS for each source. The best approach is first GC/MS characterization, then using that data to develop a site-specific (and single source specific) immunoassay calibration, followed by using 4025 with some additional GC/MS analyses. This can be accomplished with roughly a 10% 8290 mix but a detailed plan should be included in the final work plan.
8. Silicon – Trx was to review the development of the SRC list and provide a discussion why silicon was de minimus.
9. It was previously discussed that analyses may be conducted on the ore materials and tailings. These do not appear to be addressed by the work plan.
10. Pesticides – please include samples at depth per our discussion in the 6/15/06 meeting.
11. Metals – is there truly a cost benefit to eliminating aluminum? This metal may be useful for geochemical correlations.
12. Location SA-9 – please add ethylene glycol to this location.
13. Sample depths – please discuss the 0.5’ interval. How will this sample be collected to acquire enough sample volume? Will the 0-0.5’ depth over a larger area be used?
14. Table 1 – the NDEP has the following comments:
 - a. A footnote should be included that discusses how historic unknowns are addressed.
 - b. Please note that the NDEP’s comments on this table are not comprehensive as the NDEP is more concerned with the end result, e.g.: Table 3.
 - c. General chemistry should likely be associated with all LOU areas.
 - d. It appears that “Process Hardware Storage Area” is mis-labeled as LOU #0 or is mis-located on the table.
 - e. The historic US Vanadium site appears to be omitted. This site was reportedly used to process tungsten ores.

- f. LOU #2 – since the history is “poorly defined” all analytical suites should be considered.
 - g. LOU #21 – would this pond be likely to contain other metals as well as impurities in the ore?
 - h. LOU #27 – please note that this LOU area and any other that may have been impacted by PCBs should include dioxins/furans by default.
 - i. LOU #35 mentions unknown wastes – it is the opinion of the NDEP that unknown wastes should result in all analytical suites being considered.
 - j. LOU #38 were any of the flammable liquids SVOCs?
 - k. LOU #55 should include dioxins and furans as a result of the fire.
 - l. LOU #59 and LOU #60 may have conveyed all manner of contaminants and should likely include all analytical suites.
 - m. LOU #64 should also include dioxins/furans.
 - n. LOU #68 – asbestos should be considered as it is used for various auto parts.
15. Table 2 – there is a listing for “organics” which seems to imply that field screening will be conducted in lieu of analysis. This is not clear on Table 3. This item requires additional clarification.
16. Please *consider* adding borings in the following locations:
- a. In the Beta Ditch south of well M89.
 - b. North of LOU #21.
 - c. Between wells M77 and MW6R and LOUs # 34 and 47.

Attachment A
Tronox response to NDEP Draft July 27, 2006 Comments on Tables

NDEP Comment

1. Table 1, the NDEP offers the following comments:
 - a. General comment, it appears that the former U.S. Vanadium site is not identified.
 - b. General comment, the NDEP does not necessarily concur with the postulations contained on this table, however, the NDEP is more concerned with the information contained on Table 3. The NDEP will not offer detailed comments regarding disagreements with the information contained in Table 1. Some of the NDEP's concerns could be alleviated through a notation that indicates that this tables only presents "known" chemicals of interest and that the difference between Tables 1 and 3 is partially due to unknown uses at the site and to attempt to alleviate this data gap. For example, LOU area 2.
 - c. LOU 1, under the column labeled "pesticides", "herbicides" is listed in parentheses. Please explain this notation.

Response

1a The US Vanadium site is not a LOU however it will be added to the map

1b Tronox understands the NDEP position on the information contained in Table 1

1c Silvex is mentioned as having been present at this LOU. Silvex is a herbicide so in addition to pesticides, herbicides will be included in the analysis for this LOU.

NDEP Comment

2. Table 3, the NDEP offers the following comments:
 - a. General, there are a number of spelling errors on this Table, please address in the finalized version.
 - b. SA-6, the boring is located up and cross-gradient of LOU 15. It appears that this is not close enough for soil characterization of this particular LOU. NDEP is providing this observation for clarity of the table. An additional boring is not requested and it is not requested to move this boring. This is similar for the comments provided below.
 - c. SA-7, it appears that this boring is located too far down gradient for soil characterization of LOU 33 and 40. Please clarify the table.
 - d. SA-13, it appears that this boring is located approximately 200 feet down gradient of LOU 47 and 200 ft up gradient of LOU 24, not close enough for soil characterization of these specific LOUs. It is also noted that well M32 is located up gradient of LOU 24.
 - e. SA-14, it is the opinion of the NDEP that it would be difficult to determine whether any of the results from the groundwater sampling of this boring were from contamination originating from LOUs 38 and 54. No soils characterization of LOU 38 and 54 would occur either.
 - f. SA-15, this boring is located approximately 75 feet cross gradient from LOU 52 and may not address this LOU area.
 - g. SA-16, this boring located in Beta Ditch and will not characterize surface/near-surface soils in LOU 16 and 17 but may address sub-surface soils impacted by these LOUs.
 - h. SA-17, this boring is located in Beta Ditch and will not characterize soils in LOU 20 and 21.
 - i. SA-18, please provide additional specific information why this particular location was chosen for this LOU area.
 - j. SA-19, this boring is located approximately 100 feet down and cross gradient of LOU 31, too far for soil characterization per previous comments.
 - k. Footnote 2, it is assumed that his list of metals is reflective of the site-related chemicals list. Please identify any deviations in the text.

DRAFT

Response

2a A spell check was run on the table and corrections made

2b LOU 15 will be removed from this cell of the table

2c LOUs 33 and 40 will be removed from this cell of the table

2d LOUs 24 and 47 will be removed from this cell of the table. For reference US Vanadium is located less than 100 feet south and east of SA-13

2e LOUs 14 and 38 will be removed from this cell of the table

2f LOU 52 will be removed from this cell of the table

2g Tronox agrees that the surface soils from LOUs 16 and 17 will not be addressed by boring SA-17

2h LOUs 20 and 21 will be removed from this cell of the table

2i The location of SA-18 was chosen to be near the monitoring wells. The surface as well as historic air photos will be examined to identify any disturbed areas within this LOU to refine the boring location.

2j LOU 31 will be removed from this cell of the table. SA-19 is located above an area of elevated perchlorate concentrations in groundwater so will also be used to evaluate the soil as a potential source of perchlorate to the groundwater.

2k Silicon has been omitted from the metals suite as discussed on Table 2. The other site related metals are included with the exception of uranium, which is addressed through the radionuclide analysis.



Susan Crowley
Staff Environmental Specialist

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

September 27, 2006

Mr. Brian Rakvica, P.E.
Nevada Division of Environmental Protection
1771 East Flamingo, Suite 121-A
Las Vegas, NV 89119-0837

Subject: NDEP Facility ID H-000539 – Response to NDEP March 11, 2006 Comments Regarding the Tronox February 2006 *Phase A Source Area Investigation Work Plan*

Dear Mr. Rakvica:

Tronox LLC (Tronox) has undertaken an Environmental Conditions Assessment (ECA) as directed by Nevada Division of Environmental Protection (NDEP). Towards characterization of on-site conditions, Tronox submitted a *Phase A Source Area Investigation Work Plan (Work Plan)* to NDEP in February 2006. NDEP provided comments regarding the Work Plan on March 11, 2006 and the document has been revised to reflect our response to the NDEP comments. Under separate cover, the revised Work Plan will be submitted to your office by October 2, 2006. However, included with this correspondence is Attachment A, which consolidates Tronox's responses, organized in order of the NDEP comments.

Feel free to call either Keith Bailey (405) 775-6526 or me at (702) 651-2234 if you have any questions regarding this correspondence. Thank you.

Sincerely,

Susan Crowley
Staff Environmental Specialist, CEM 1428 exp 3-8-07

Overnight Mail

CC: See Attached Distribution List

smz/Trx to NDEP - 9-28-06 re Delivery of SA Phase A Work Plan RTC.doc

Tronox LLC

8000 West Lake Mead Parkway, Henderson, Nevada 89015 • P.O. Box 55, Henderson, Nevada 89009

Attachment A
Tronox Response to NDEP March 11, 2006 Comments on Source Area
Investigation Workplan dated February 23, 2006

NDEP Comment

1. It appears that the tone and purpose of the work plan has evolved. Based on the September 30, 2005 letter from Kerr-McGee to the NDEP the purpose of the Phase A work plan was as follows: "to determine how many of the site-related chemicals (SRCs) are actually present on-site and to **start** the screening process to select SRCs applicable to future sampling efforts and **support** the selection of chemicals of potential concern (COPCs)." Please note that bolding, and italicizing have been added for emphasis (above and below). In the February 2006 work plan, executive summary, page ES-1, Trx states "The activities covered by this work plan... is intended to evaluate the presence or absence of site-related chemicals (SRCs) in areas of highest potential impacts. Further it is intended to support the selection of constituents of potential concern (COPC)." Section 1.0, page 1-1 goes on to stated "this investigation is to assess which SRCs are present or absent at the Site and to identify which of the SRCs would be applicable in future sampling efforts." The NDEP would like to provide the following clarification regarding it's understanding:
 - a. Data will be collected in such a manner that it is useful for the selection of COPC selection, however, this work plan *alone* will not support the selection of COPCs.
 - b. Additional characterization of the site based on the SRC list may be required after Phase A.
 - c. Eight borings and three monitoring wells are not likely to be sufficient to support COPC selection. Additional discussion between the NDEP's risk assessment team and Trx's risk assessment team is likely warranted.
 - d. Additional investigation in the soils below the water table and groundwater in the deeper zones of the Muddy creek Formation are likely to be necessary.

Response

- 1 a. *The scope of the Phase A work has been expanded and the text modified.*
- 1 b. *The Phase B investigation is specifically for additional characterization.*
- 1 c. *Tronox has met with the NDEP and based upon discussions with NDEP, have revised the Work Plan to include 27 Phase A boring locations*
- 1 d. *At this time, the Phase A Source Area Investigation will not include soil samples collected below the water table, however, Tronox understands that the NDEP is interested In this information.*

NDEP Comment

2. Executive Summary, page ES-1, the same text is repeated twice in the section starting with the words "The activities covered by this work plan..." In the future, please complete a more rigorous QA/QC process prior to submittal.

Response

The text will be corrected and checked more thoroughly in the future.

NDEP Comment

3. Section 3.1, page 3-1, the NDEP has the following comments:
- a. Without lithologic cross-sections (showing water table elevations as well as lithologic details) it is not possible for the NDEP to determine if the proposed sampling intervals are adequate. It is suggested that samples be taken every 10' to the water table.
 - b. The NDEP is not opposed to groundwater samples being taken from the east and west interceptor well galleries, however, it should be noted that this procedure will mask the high and low concentrations within each well. It is likely that this data will not be useful for COPC selection. Trx may need to consider installation of additional groundwater monitoring wells on the plant site area once the results of the soil analysis are complete.

Response

- 3 a. *Samples will be collected every 10 feet to the water table.*
3 b. *The plan will be revised to collect water from individual wells as opposed to the well galleries. Tronox understands that additional wells may be necessary in the future. Tronox is also evaluating if some wells should be removed from the monitoring program.*

NDEP Comment

4. Section 3.3, page 3-3, please note that PCBs are not pesticides.

Response

4. *PCBs will be discussed separately from pesticides.*

NDEP Comment

5. Section 3.3, page 3-3, Trx states "it is anticipated that once the soil and groundwater data are developed, many SRCs and portions of the associated broad suite constituent analysis can be eliminated from future sampling programs." As stated above, the NDEP does not concur.

Response

5. *Comment noted and the sentence will be revised.*

NDEP Comment

6. Table 3, please note that the NDEP does not warrant the applicability of the information presented on this table as it is the responsibility of the project CEM.
- a. Please note that asbestos appears to be missing from this table.
 - b. Ethylene glycol could be combined with the "Fuel Alcohols" line item
 - c. The listing of metals is incomplete versus the presentation on Table 4. For example, silicon, tin, thallium, etc.

Response

6. *Comment noted and the tables will be revised.*

NDEP Comment

7. Tables 4 and 7, it was the NDEP's understanding that this table represents the full list of analytes related to the SRC list. If not, Trx should develop a supplemental list of SRCs that are not proposed for analysis (with justification) and provide this to the NDEP. It is not clear to the NDEP what is intended.

- a. Radionuclides that are proposed to be back quantitated are not presented.
- b. Please discuss if asbestos is proposed to be addressed by the elutriator method or an alternative method.
- c. It is noted that semi-volatile organic compound (SVOC) analysis is proposed but polycyclic aromatic hydrocarbon (PAH) analysis is not. It is noted that the SVOC analysis will not provide adequate detection limits, please include PAH analysis.
- d. Please note that there are some sorting errors on table 4 with regards to alphabetical order.
- e. It has been reported by others that 1,4-dioxane can be analyzed and detected at a sufficiently low level via method 8270 analysis. Please discuss this issue with your laboratories and add 1,4-dioxane to the list of analytes, if appropriate.
- f. Table 4, chlorobenzol (as listed on the SRC list, and monochlorobenzene as duplicated on the SRC list) appears to be missing from this table. Please verify that the compound names listed on the SRC list are consistently used in future documents. If synonyms are used a cross-reference should be included. For example, methyl isobutyl ketone and orthodichlorobenzene.
- g. It appears that some of the questions regarding methodology that were evident in the SRC list have been addressed. The NDEP requests that an updated SRC List be provided under separate cover.

Response

7 a. Consistent with discussions with the NDEP, the current proposal is to analyze 100% of soil and water samples with gamma spec reporting for Ra^{226} and Ra^{228} and to analyze 10% of samples with alpha spec reporting for Th^{232} , Th^{230} , U^{238} , U^{235} , and U^{234} . These data will be used to demonstrate secular equilibrium/calibration.

7 b. Asbestos is intended to be analyzed by the elutriator method, however a chosen lab has not yet been selected and an alternative method may be proposed in the Phase A Source Area Work Plan to be submitted by October 2nd, 2006 if the elutriator method is not available at a reasonable cost.

7 c. SVOCs which are not SRCs or SRC related have been eliminated from the analyte list as discussed with NDEP. The frequency of SIM analysis for PAHs and hexachlorobenzene has been reduced to 10% of the total samples analyzed for SVOCs and should still maintain sufficient sensitivity to detect these SIM analytes in appropriate LOUs. The dichlorobenzenes were eliminated from the SVOC list because they are duplicated in the VOC analyte list.

7 d. The table has been sorted alphabetically.

7 e. 1,4-dioxane has been added.

7 f. Table 4 will be modified

7 g. An updated SRC list is included in the Phase A Source Area Investigation Work Plan as Table 7

NDEP Comment

8. Table 5, the NDEP has the following comments:

- a. None of the superscripts on this table are defined.

Response

8 a. The table will be revised.

NDEP Comment

9. Table 6, please note that the NDEP does not warrant the applicability of the information presented on this table as it is the responsibility of the project CEM.

Response

9. *Tronox understands that the content, accuracy and execution of the work plan is their responsibility.*

NDEP Comment

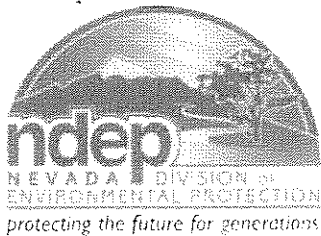
10. Plate 1, the NDEP has the following comments:

- a. Based on Plate 6 of the Trx Conceptual Site Model (CSM) dated February 2005, it appears that boring SA-1 should be located further north. In addition, based on the number of letter of understanding (LOU) areas in the vicinity, it appears that a boring is warranted on the north side of each unit building (units 1 through 6). The specific location of each of these borings should be coordinated between Plate 6 of the CSM and site knowledge.
- b. It would be helpful if the LOU areas from Plate 6 of the CSM were shown on this figure.
- c. It is the belief of the NDEP that additional borings are warranted to address the former manganese tailings area, LOU #34, various locations.
- d. It is the belief of the NDEP that additional borings are warranted to address ponds C-1 and Mn-1, LOUs #20 and 21, respectively. It is suggested that an additional boring be placed downgradient of these ponds.
- e. It is the belief of the NDEP that additional borings are warranted to address ponds AP-1, AP-2, AP-3, and AP-4, LOUs #16, 17 and 18.
- f. It is the belief of the NDEP that additional borings are warranted to address ponds WC-1 and WC-2, LOUs # 22 and 23, respectively.
- g. It is the belief of the NDEP that additional borings are warranted to address the historic trade effluent settling ponds, LOU #1. It is suggested that a boring be placed downgradient of existing pond GW-11.
- h. It is the belief of the NDEP that additional borings are warranted to address ponds P-2 and S-1, LOUs #9 and 13, respectively.
- i. It is the belief of the NDEP that additional borings are warranted to address the historic hazardous waste landfill, LOU #10.
- j. It is the belief of the NDEP that additional borings are warranted to address the Beta Ditch, Northwest Drainage Ditch and Mystery Ditch.
- k. It is likely that additional borings are warranted in the future to address other LOU areas, potential source areas and deeper soils (below the water table).
- l. Per the NDEP's previous comments on the *Upgradient Work Plan*, the NDEP requests that samples be collected in the storm ditch upgradient of the plant site area.

Response

- 10 a. *The boring locations will be adjusted as discussed in meetings with the NDEP.*
10 b. *Plate 1 has been revised to include the LOU areas.*

10 c through l. Comments are noted. Tronox has significantly revised the boring locations and sampling intervals. Twenty seven boring locations will be sampled in Phase A. Tronox also plans to address additional sampling during the Phase B Source Area Investigation.



STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Kenny C. Guinn, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

10/12 Digital to S Crowley

007 11 2006

October 11, 2006

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:
Quality Assurance Project Plan (QAPP)
dated August 2006 (received September 29, 2006)

Dear Ms. Crowley,

The NDEP has received and reviewed Tronox's report identified above and provides comments below.

1. Section A8.2, please note that NELAP accreditation is not a substitute for Nevada certification although NELAP accreditation is helpful in expediting the certification process.
2. Laboratory QA Manuals, Section A, please note that the laboratory QA manuals should be included as an appendix to the QAPP.
3. Filtering of Samples, Section B.2, filtering of aqueous samples is not discussed in Section B.2. SOP 7130-04020 states (Section 4.10), "If filtration is required ...". The QAPP should clarify if and when filtration will be performed.
4. Database Fields, Section B.10, Section B, page 8 specifies "At a minimum, the database will contain the following fields:" This list should also include the Reporting Limit, Dilution Factor, Qualifier(s) and Reason Code(s).
5. Data Validation, Section D, general comment, it is requested that when data are qualified due to spike recovery issues, including MS, surrogates, and LCS, that the qualifier include a direction of potential bias. Use of + and - signs with the qualifier (e.g. J+) is required. It is also required that the data validation reports include summary tables that contain the percent recovery and RPD values for the applicable samples so that it is clear of the potential bias for each qualified sample. For example, data qualified due to matrix spike issues should contain a percent recovery for the analyte that exceed the recovery criteria (low or high) and the associated sample to which this qualifier applies.



6. Data Validation, Section D.1.3, partial review should also include Chain-of-Custody items including sample integrity, and cooler/sample temperature.
7. Tables, general comment, a number of tables contain superscripts that appear to refer to a footnote, yet none of the footnotes are provided. Examples include Table A-2, page 10 of 24, reference to "(3)" and Table B-2, page 15 of 24, reference to "(1)."
8. Hexavalent Chromium Holding Time for Soils, Table B-1, page 13 of 24, the correct holding time for soils prepared via EPA Method 3060A for hexavalent chromium is 4 days from digestion to analysis. This specification is consistent with the discussion held with Tronox on 8/22/2006 and captured in the meeting minutes.
9. Radiochemical Analysis, Tables B-2, pages 16 and 17 of 24. Table B-2 lists two different types of radiochemical methods for Radium 226 and Radium 228. The aqueous methods that are listed include 903.1 (alpha) and 904.0 (beta), the listed soil methods are both 901.1/EML HASL 300 (gamma spectroscopy). Please clarify if the intent is to use different radiochemical analyses for the soil and aqueous samples. The alpha and beta methods are also listed in Table B-3. If gamma spectroscopy is planned the appropriate QC checks for the method should be provided in Table B-3.

The QAPP should be revised and resubmitted. It is expected that these comments will be addressed as part of the implementation of the Phase A Scope of Work and that the revision of the QAPP shall not delay the implementation of the Phase A Scope of Work. Please provide a revised QAPP as soon as possible. Please advise the NDEP when this revised document 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

Ms. Susan Crowley

10/11/2006

Page 3

CC: Jim Najima, NDEP, BCA, Carson City
Jeff Johnson, 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, BEC, 875 West Warm Springs Road, Henderson, Nevada 89015
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., Suite 100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, 1800 Concord Pike, Hanby 1, Wilmington,
DE 19850-5437
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
David Gratson, Neptune and Company, 1505 15th Street, Suite B, Los Alamos, NM 87544

**Tronox Response to NDEP October 11, 2006 Comments
on Quality Assurance Project Plan dated September 28, 2006**

NDEP Comment

1 Section A8.2, please note that NELAP accreditation is not a substitute for Nevada certification although NELAP accreditation is helpful in expediting the certification process.

Response

The section will be revised to state, "In the absence of Nevada certification, National Environmental Laboratory Accreditation Program (NELAP) may be considered acceptable until Nevada offers certification for the parameter of interest. The laboratories must submit the necessary IDC and PE data to obtain certification from NDEP, Bureau of Water Quality Planning (BWQP) for all project parameters of interest and methods of interest that Nevada will certify."

Tronox has required that the laboratories performing sample analyses for the Henderson facility be either already certified in Nevada for each parameter/matrix combination or have submitted all the necessary IDC and PE data to obtain certification from BWQP, if the certification is available.

NDEP Comment

2 Laboratory QA Manuals, Section A, please note that the laboratory QA manuals should be included as an appendix to the QAPP.

Response

When final laboratory selection is made for each upcoming investigation the lab QA manuals will be included as an appendix to the QAPP on file at the time of sampling. Section A 9.3 will be revised to state the Laboratory QA manuals for the laboratories currently performing the work are included in Appendix B. When new or different laboratories are used their manuals will also be provided.

NDEP Comment

3 Filtering of Samples, Section B.2, filtering of aqueous samples is not discussed in Section B.2. SOP 7130-04020 states (Section 4.10), "If filtration is required ...". The QAPP should clarify if and when filtration will be performed.

Response

In general Tronox will not filter collected water samples, however if filtration is needed for specific sampling events Tronox will provide information in the project specific workplans about field filtration. For the Phase A Source Area Investigation Tronox plans to filter only the groundwater grab samples from the soil borings if the apparent turbidity is high. Both filtered and unfiltered samples will be collected for the analysis of metals and radionuclides. All other analyses of the soil boring groundwater grab samples will be performed on unfiltered samples. The monitor well water analyses will be performed on unfiltered samples.

NDEP Comment

4 Database Fields, Section B.10, Section B, page 8 specifies "At a minimum, the database will contain the following fields:" This list should also include the Reporting Limit, Dilution Factor, Qualifier(s) and Reason Code(s).

Response

These fields are included in the database and Tronox will add the field description to the QAPP.

NDEP Comment

5 Data Validation, Section D, general comment, it is requested that when data are qualified due to spike recovery issues, including MS, surrogates, and LCS, that the qualifier include a direction of potential bias. Use of + and – signs with the qualifier (e.g. J+) is required. It is also required that the data validation reports include summary tables that contain the percent recovery and RPD values for the applicable samples so that it is clear of the potential bias for each qualified sampled. For example, data qualified due to matrix spike issues should contain a percent recovery for the analyte that exceed the recovery criteria (low or high) and the associated sample to which this qualifier applies.

Response

When data are qualified by validators and a direction of potential bias is clear, based on results in the data set, then + or – signs will be added to indicate the possible bias. Summary tables with percent recovery and RPD data indicating the need for data qualification will be included with the data validation memos. This will be added under section D 3.2.

NDEP Comment

6 Data Validation, Section D.1.3, partial review should also include Chain-of-Custody items including sample integrity, and cooler/sample temperature.

Response

These items are included in the partial review and will be described in the QAPP.

NDEP Comment

7 Tables, general comment, a number of tables contain superscripts that appear to refer to a footnote, yet none of the footnotes are provided. Examples include Table A-2, page 10 of 24, reference to “(3)” and Table B-2, page 15 of 24, reference to “(1).”

Response

The superscripts and footnotes for the tables will be corrected.

NDEP Comment

8 Hexavalent Chromium Holding Time for Soils, Table B-1, page 13 of 24, the correct holding time for soils prepared via EPA Method 3060A for hexavalent chromium is 4 days from digestion to analysis. This specification is consistent with the discussion held with Tronox on 8/22/2006 and captured in the meeting minutes.

Response

The 7 day leachate holding time was derived from EPA 3060A Sec. 6.4, however the holding time will be changed to 4 days based on the meeting minutes cited above.

NDEP Comment

9 Radiochemical Analysis, Tables B-2, pages 16 and 17 of 24. Table B-2 lists two different types of radiochemical methods for Radium 226 and Radium 228. The aqueous methods that are listed include 903.1 (alpha) and 904.0 (beta), the listed soil methods are both 901.1/EML HASL 300 (gamma spectroscopy). Please clarify if the intent is to use different radiochemical analyses for the soil and aqueous samples. The alpha and beta methods are also listed in Table

B-3. If gamma spectroscopy is planned the appropriate QC checks for the method should be provided in Table B-3.

Response

Tables B-2 and B-3 will be adjusted to reflect Tronox's intent to require gamma spectroscopy for the analysis of Ra-226 and Ra-228 in soil and EPA 903.1 for Ra-226 and EPA Method 904.0 for Ra-228 in water. The laboratories performing the radiochemical analyses have advised us that the analysis of Ra-226 and Ra-228 in water by gamma spectroscopy is technically not appropriate and insufficiently sensitive to meet the detection limits desired .

Closing

The NDEP letter states: "It is expected that these comments will be addressed as part of the implementation of the Phase A Scope of Work and that the revision of the QAPP shall not delay the implementation of the Phase A Scope of Work." Therefore Phase A investigation will proceed as scheduled.

DRAFT

October 24, 2006

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 A Source Area Investigation Work Plan
dated September 2006 (received October 2, 2006)

Dear Ms. Crowley,

The NDEP has received and reviewed Tronox's report identified above and provides comments below.

1. General comment, it appears that this document was not well prepared or thought out. Based upon the number of meetings and volume of correspondence between the NDEP and TRX over the past 13 months, this is disconcerting. The aforementioned report appears to lack even a basic quality check prior to being submitted to the NDEP. This type of submittal is not good use of the NDEP's time or TRX's resources.
2. General comment, it is recommended that TRX use established terminology and definitions, and not develop new terminology.
3. General comment, there appears to be confusion between Data Quality Indicators which are part of the six data usability criteria (EPA, 1991) and Quality Assurance Program content,
4. General comment, please note that NAPLs have been detected to the west of the Tronox property in a number of locations. Please be aware of this condition when disturbing the subsurface environment.
5. General comment, the specific issues relating to data quality assurance have not been reviewed or commented on as part of the NDEP's review of the subject document. TRX is referred to the NDEP's October 11, 2006 comments on the *Quality Assurance Project Plan (QAPP)*.
6. General comment, the NDEP's review focused heavily on the tables and figures included in the work plan. It is the belief of the NDEP that these parts of the work plan provide a concise summary of the work to be completed. NDEP has generally not included

comments on language issues (grammatical) or disagreements with the content of the text of the work plan.

7. Executive Summary, pg ES-1, 1st paragraph, TRX states “The assessment is being conducted under the supervision of the Nevada Division of Environmental Protection (NDEP).” The NDEP requests that TRX clarify that NDEP is providing regulatory oversight, not “supervision”. This reference to the NDEP also occurs in the Introduction.
8. Executive Summary, pg ES-1, 6th paragraph, in reference to Table 4 the NDEP requests that TRX specifically perform the following analyses as part of Data Review: anion-cation balance; comparison of measured TDS versus calculated TDS; and a comparison of measured TDS to the EC ratio. These quality checks are all listed in Standard Methods for the Examination of Water and Wastewater. The laboratory may complete these checks, however, it is requested that TRX verify and discuss this issue in the reporting. This discussion should be carried through the work plan in the appropriate sections and does not necessarily need to be addressed in the Executive Summary.
9. Section 1.0, pg 1-1, 5th paragraph, TRX states “The following U.S. Environmental Protection Agency (EPA) guidance documents were consulted during the preparation of this work plan:
 - a. EPA 1989, Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual (Part A) interim final (EPA/540/1-89/002), December.
 - b. EPA 2002, Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers, OSWER Technology Innovation Office, May.”
 - c. The RAGS Vol. 1, Part A reference is a good reference for evaluating how data collected will be used; however, additional documents for reference in preparing a work plan and SOPs include:
 - i. USEPA, 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA. Office of Emergency and Remedial Response, October.
 - ii. USEPA, 1995, Guidance for the Preparation of Standard Operating Procedures (SOPs) for Quality Related Documents, EPA QA/G-6, Office of Research and Development, Washington, D.C., EPA/600/R-96/027, November.
10. Section 3.3, page 3-3, TRX states “pesticides were not manufactured at the Site.” This is contrary to the NDEP’s understanding of the Site as previously discussed with Tronox. Several tenants of the TRX property reportedly used and or manufactured pesticides at the Site. No response is necessary to this comment.
11. Section 4.2.1 Soil Borings, page 4-1, 2nd paragraph, TRX states “The boring logs will record the following sampling information...lithologic description in accordance with the Unified Soils Classification System (USCS) and American Society of Testing Materials (ASTM) standards...” Please note that the following references should be used:
 - a. ASTM International, 2000, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), Designation: D 2487-00.

- b. ASTM International, 2000, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), Designation: D 2488 – 00.
12. Section 4.2.1, page 4-1, please be advised that a 10.2 eV lamp is not suitable for many of the compounds that are being investigated. TRX is advised to review the ionization potentials of the compounds being investigated and select a more appropriate lamp. Montrose has found that it is necessary to utilize a higher voltage lamp and a flame ionization detector. TRX is encouraged to review BRC's approved SOP-39 regarding PID Screening Procedures and to discuss this matter with Montrose personnel.
13. Section 4.2.1 Soil Borings, page 4-1, 2nd paragraph, TRX states "The boring logs will record the following sampling information...lithologic description in accordance with the Unified Soils Classification System (USCS) and American Society of Testing Materials (ASTM) standards..." The following references should be used:
 - a. ASTM International, 2000, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), Designation: D 2487-00.
 - b. ASTM International, 2000, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), Designation: D 2488 – 00.
14. Section 4.2.2, pages 4-1 and 4-2, it appears that TRX has confused sonic and hollow stem auger drilling and sampling methods.
15. Section 4.2.2, pages 4-1 and 4-2, if areas that are observed to be contaminated are located during the drilling operation, TRX is encouraged to collect a sample of the impacted material.
16. Section 4.2.5.1, pg 4-3, 1st paragraph, TRX states "The electric sounder will be decontaminated by rinsing with deionized water after each use." Please note that it is standard practice to wash equipment between wells.
17. Sections 4.2.5.2 and 4.2.5.3, pages 4-3 and 4-4, the NDEP has the following comments:
 - a. It is not clear to the NDEP why the USEPA guidance for low flow groundwater sampling was not used.
 - b. TRX indicates that water will be evacuated at a rate of 100 to 500 mL per minute. Please note that it may be necessary to reduce the flow rate to below 100 mL per minute to comply with the sampling protocol.
 - c. Please note that dissolved oxygen and turbidity can vary by up to 10%, rather than the 5% indicated by TRX.
18. Section 4.2.5.3, page 4-4, TRX states that "A low flow bladder pump (micropurge pump) will be used to dispense the water samples into the appropriate sample container as long as static water level is maintained for the duration of bottle-filling activities." TRX does not state what the alternative is for this scenario.
19. Section 4.4.1, page 4-7 and Section 4.4.2, page 4-8, TRX states "This table also contains the data quality limits (DQLs). The DQLs are industrial-based Preliminary Remediation Goals (PRGs) for soil (EPA 2004)." DQLs are neither defined nor used in the referenced document; the NDEP did a search for both data quality limit and DQL in the reference document. TRX goes on to state "The laboratories have been instructed to achieve 0.1 of the DQLs where possible using the standard laboratory procedures." Based on this sentence TRX appears to be trying to define a detection or

- quantitation limit. A quantitation limit is not a PRG. These sections require additional clarification.
20. Section 4.4.3, pg 4-8, 2nd bullet. Please provide reference for method.
 21. Section 4.4.3, pg 4-8, 3rd bullet. Please find and use a current/supported reference. For example, at the TechStreet™ web site (<http://www.techstreet.com>); API tab, search for RP-40 lists this reference as follows: WITHDRAWN API RP 40 Recommended Practices for Core Analysis Edition: 2nd American Petroleum Institute 01-Feb-1998 200 pages.
 22. Section 4.4.3 Geotechnical Testing Program, page 4-8, 5th bullet, the referenced test method is for particle sizes greater than 200 mesh (75-µm), but will not provide information on silt and clay size material. The NDEP recommends adding particle size analysis using ASTM Method C 117-04.
 23. Section 4.5 Equipment Decontamination, page 4-8, TRX states “All non-disposable soil sampling equipment (e.g., split-spoon samplers, etc.) will be disassembled and decontaminated prior to the collection of each sample. This equipment may be decontaminated by either steam cleaning or by washing with a non-phosphate detergent solution (Simple Green™ or similar) followed by rinsing with distilled/deionized water...If non-dedicated groundwater sampling equipment is used to collect groundwater samples, the equipment will be decontaminated by circulating a solution of water and detergent (e.g., Simple Green™) through the equipment followed by rinsing with distilled water.” Alconox is typically used for this purpose; Attachment E of the HSP includes an MSDS for Alconox, but it does appear to be used for washing equipment herein. Please provide information on the use of Simple Green for this purpose or clarify what is intended.
 24. Section 4.7, page 4-9, Please specify datum, for example, NAD83.
 25. Section 4.8.3 Quality Assurance Program, page 4-10, the NDEP recommends that this section’s title be changed to “Data Quality Indicators.” Please delete the first two paragraphs in this section as they add confusion to the subject. Then drop the titles for Section 4.8.3.1, Definitions, page 4-11 and Section 4.8.4 Comparison of Data Sets, page 4-11. Add *Representativeness* in this section. Finally, add and discuss *Comparability* to this section for a complete discussion of data quality indicators. These changes would bring the new Section 4.8.3 into compliance with the EPA document Guidance for Data Usability in Risk Assessment (Part A) Final (EPA, 1992).
 26. Section 4.8.3.1, page 4-11, TRX states “Accuracy will be evaluated using percent recovery data.” Insert the following text at the end of the sentence “from spiked samples.”
 27. Section 4.8.3.1, pg 4-11. TRX states “The completeness goal is the same for all data uses that a sufficient amount of valid data be generated to accomplish the objectives of the study. Standard methods of evaluation will be used to assess accuracy and precision data. Completeness can be quantitatively assessed simply by calculation of the percentage of valid data obtained.” Please note that the completeness goal should be established as a percentage value before going into the field.
 28. Section 5.2, page 5-1, it would be more appropriate to provide an updated version of the conceptual site model (CSM) than a stand-alone report. The new data that is collected

- must be incorporated into the site-wide data set. The NDEP believes that this issue can be discussed further in upcoming meetings, if necessary.
29. Sections 5.3 and 5.4, pages 5-1 and 5-2, it is not clear why TRX has not referenced the applicable USEPA guidance, it is expected that this issue can be discussed further in meetings.
 30. Section 7.0, pg 7-1. "ASTM. 1990. Standard Practice for Description and Identification of Soils: D2488-84." Please note that ASTM has a more recent reference for this practice.
 31. Table 5, the NDEP has the following comments:
 - a. PCB analysis appears to be excluded from location SA-13. Please include this analysis at this location. Also, please note that this is contrary to the information presented on Tables 2 and 3.
 32. Table 6, the NDEP has the following comments:
 - a. PCB analysis appears to be excluded from location M-31A. Please include this analysis at this location. Also, please note that this is contrary to the information presented on Tables 2 and 3.
 33. Tables 8 and 9, NDEP has not verified the accuracy of these tables as it is the responsibility of TRX.

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
Jeff Johnson, 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
Ranjit Sahu, BEC, 875 West Warm Springs Road, Henderson, Nevada 89015
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., Suite 100, Novato, CA 94947
Lee Erickson, Stauffer Management Company, 1800 Concord Pike, Hanby 1, Wilmington,
DE 19850-5437
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
David Gratson, Neptune and Company, 1505 15th Street, Suite B, Los Alamos, NM 87544

**Responses to NDEP October 24, 2006 E-mail Comments
Phase A Source Area Investigation Workplan, September 29, 2006
Tronox Facility, Henderson, Nevada**

NDEP Comment

1. General comment, it appears that this document was not well prepared or thought out. Based upon the number of meetings and volume of correspondence between the NDEP and TRX over the past 13 months, this is disconcerting. The aforementioned report appears to lack even a basic quality check prior to being submitted to the NDEP. This type of submittal is not good use of the NDEP's time or TRX's resources.

Response

Comment noted.

NDEP Comment

2. General comment, it is recommended that TRX use established terminology and definitions, and not develop new terminology.

Response

Comment noted.

NDEP Comment

3. General comment, there appears to be confusion between Data Quality Indicators which are part of the six data usability criteria (EPA, 1991) and Quality Assurance Program content,

Response

See noted responses to NDEP comments # 19 and #25 below

NDEP Comment

4. General comment, please note that NAPLs have been detected to the west of the Tronox property in a number of locations. Please be aware of this condition when disturbing the subsurface environment.

Response

Tronox has advised field personnel of this situation, and has confirmed that the field health and safety plan does address this potential. Text inserted into Section 2.4.3.

NDEP Comment

5. General comment, the specific issues relating to data quality assurance have not been reviewed or commented on as part of the NDEP's review of the subject document. TRX is referred to the NDEP's October 11, 2006 comments on the *Quality Assurance Project Plan* (QAPP).

Response

Comment noted.

NDEP Comment

6. General comment, the NDEP's review focused heavily on the tables and figures included in the work plan. It is the belief of the NDEP that these parts of the work plan provide a concise summary of the work to be completed. NDEP has generally not included comments on language issues (grammatical) or disagreements with the content of the text of the work plan.

Response

Comment noted.

NDEP Comment

7. Executive Summary, pg ES-1, 1st paragraph, TRX states "The assessment is being conducted under the supervision of the Nevada Division of Environmental Protection (NDEP)." The NDEP requests that TRX clarify that NDEP is providing regulatory oversight, not "supervision". This reference to the NDEP also occurs in the Introduction.

Response

See Executive Summary (page ES-1) for revised text.

NDEP Comment

8. Executive Summary, pg ES-1, 6th paragraph, in reference to Table 4 the NDEP requests that TRX specifically perform the following analyses as part of Data Review: anion-cation balance; comparison of measured TDS versus calculated TDS; and a comparison of measured TDS to the EC ratio. These quality checks are all listed in Standard Methods for the Examination of Water and Wastewater. The laboratory may complete these checks, however, it is requested that TRX verify and discuss this issue in the reporting. This discussion should be carried through the work plan in the appropriate sections and does not necessarily need to be addressed in the Executive Summary.

Response

See revised text inserted into Section 3.3 and Section 4.8.2.

NDEP Comment

9. Section 1.0, pg 1-1, 5th paragraph, TRX states "The following U.S. Environmental Protection Agency (EPA) guidance documents were consulted during the preparation of this work plan:
 - a. EPA 1989, Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual (Part A) interim final (EPA/540/1-89/002), December.
 - b. EPA 2002, Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers, OSWER Technology Innovation Office, May."
 - c. The RAGS Vol. 1, Part A reference is a good reference for evaluating how data collected will be used; however, additional documents for reference in preparing a work plan and SOPs include:
 - i. USEPA, 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA. Office of Emergency and Remedial Response, October.
 - ii. USEPA, 1995, Guidance for the Preparation of Standard Operating Procedures (SOPs) for Quality Related Documents, EPA QA/G-6, Office of Research and Development, Washington, D.C., EPA/600/R-96/027, November.

Response

See revised list of references in Section 1.0.

NDEP Comment

10. Section 3.3, page 3-3, TRX states “pesticides were not manufactured at the Site.” This is contrary to the NDEP’s understanding of the Site as previously discussed with Tronox. Several tenants of the TRX property reportedly used and or manufactured pesticides at the Site. No response is necessary to this comment.

Response

See revised text in Section 3.3.

NDEP Comment

11. Section 4.2.1 Soil Borings, page 4-1, 2nd paragraph, TRX states “The boring logs will record the following sampling information...lithologic description in accordance with the Unified Soils Classification System (USCS) and American Society of Testing Materials (ASTM) standards...” Please note that the following references should be used:
- a. ASTM International, 2000, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), Designation: D 2487-00.
 - b. ASTM International, 2000, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), Designation: D 2488 – 00.

Response

See Section 4.2.1 for added references.

NDEP Comment

12. Section 4.2.1, page 4-1, please be advised that a 10.2 eV lamp is not suitable for many of the compounds that are being investigated. TRX is advised to review the ionization potentials of the compounds being investigated and select a more appropriate lamp. Montrose has found that it is necessary to utilize a higher voltage lamp and a flame ionization detector. TRX is encouraged to review BRC’s approved SOP-39 regarding PID Screening Procedures and to discuss this matter with Montrose personnel.

Response

See Section 4.2.1, 2nd paragraph for revised text.

NDEP Comment

13. Section 4.2.1 Soil Borings, page 4-1, 2nd paragraph, TRX states “The boring logs will record the following sampling information...lithologic description in accordance with the Unified Soils Classification System (USCS) and American Society of Testing Materials (ASTM) standards...” The following references should be used:
- a. ASTM International, 2000, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), Designation: D 2487-00.
 - b. ASTM International, 2000, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), Designation: D 2488 – 00.

Response

See revised text in Section 4.2.1.

NDEP Comment

14. Section 4.2.2, pages 4-1 and 4-2, it appears that TRX has confused sonic and hollow stem auger drilling and sampling methods.

Response

See revised and clarified text in Section 4.2.2.

NDEP Comment

15. Section 4.2.2, pages 4-1 and 4-2, if areas that are observed to be contaminated are located during the drilling operation, TRX is encouraged to collect a sample of the impacted material.

Response

See revised text in Section 4.2.2.

NDEP Comment

16. Section 4.2.5.1, pg 4-3, 1st paragraph, TRX states "The electric sounder will be decontaminated by rinsing with deionized water after each use." Please note that it is standard practice to wash equipment between wells.

Response

See revised text in Section 4.2.5.1.

NDEP Comment

17. Sections 4.2.5.2 and 4.2.5.3, pages 4-3 and 4-4, the NDEP has the following comments:

- It is not clear to the NDEP why the USEPA guidance for low flow groundwater sampling was not used.
- TRX indicates that water will be evacuated at a rate of 100 to 500 mL per minute. Please note that it may be necessary to reduce the flow rate to below 100 mL per minute to comply with the sampling protocol.
- Please note that dissolved oxygen and turbidity can vary by up to 10%, rather than the 5% indicated by TRX.

Response

See revised text in Sections 4.2.5.2 and 4.2.5.3.

NDEP Comment

18. Section 4.2.5.3, page 4-4, TRX states that "A low flow bladder pump (micropurge pump) will be used to dispense the water samples into the appropriate sample container as long as static water level is maintained for the duration of bottle-filling activities." TRX does not state what the alternative is for this scenario.

Response

See revised text in Section 4.2.5.3.

NDEP Comment

19. Section 4.4.1, page 4-7 and Section 4.4.2, page 4-8, TRX states "This table also contains the data quality limits (DQLs). The DQLs are industrial-based Preliminary Remediation Goals (PRGs) for soil (EPA 2004)." DQLs are neither defined nor used in the referenced document; the NDEP did a search for both data quality limit and DQL in the reference document. TRX goes on to state "The laboratories have been instructed to achieve 0.1 of the DQLs where possible using the standard laboratory procedures." Based on this sentence TRX appears to be trying to define a detection or quantitation limit. A quantitation limit is not a PRG. These sections require additional clarification.

Response

See revised text in Section 4.4.1 and 4.4.2.

NDEP Comment

20. Section 4.4.3, pg 4-8, 2nd bullet. Please provide reference for method.

Response

See revision to Section 4.4.3.

NDEP Comment

21. Section 4.4.3, pg 4-8, 3rd bullet. Please find and use a current/supported reference. For example, at the TechStreet™ web site (<http://www.techstreet.com>); API tab, search for RP-40 lists this reference as follows: WITHDRAWN API RP 40 Recommended Practices for Core Analysis Edition: 2nd American Petroleum Institute 01-Feb-1998 200 pages.

Response

See revised list of parameters in Section 4.4.3.

NDEP Comment

22. Section 4.4.3 Geotechnical Testing Program, page 4-8, 5th bullet, the referenced test method is for particle sizes greater than 200 mesh (75-µm), but will not provide information on silt and clay size material. The NDEP recommends adding particle size analysis using ASTM Method C 117-04.

Response

See revision to list of parameters in Section 4.4.3.

NDEP Comment

23. Section 4.5 Equipment Decontamination, page 4-8, TRX states "All non-disposable soil sampling equipment (e.g., split-spoon samplers, etc.) will be disassembled and decontaminated prior to the collection of each sample. This equipment may be decontaminated by either steam cleaning or by washing with a non-phosphate detergent solution (Simple Green™ or similar) followed by rinsing with distilled/deionized water... If non-dedicated groundwater sampling equipment is used to collect groundwater samples, the equipment will be decontaminated by circulating a solution of water and detergent (e.g., Simple Green™) through the equipment followed by rinsing with distilled water." Alconox is typically used for this purpose; Attachment E of the HSP includes an MSDS for Alconox, but it

does appear to be used for washing equipment herein. Please provide information on the use of Simple Green for this purpose or clarify what is intended.

Response

See revised text in Section 4.5.

NDEP Comment

24. Section 4.7, page 4-9, Please specify datum, for example, NAD83.

Response

See revised text in Section 4.7.

NDEP Comment

25. Section 4.8.3 Quality Assurance Program, page 4-10, the NDEP recommends that this section's title be changed to "Data Quality Indicators." Please delete the first two paragraphs in this section as they add confusion to the subject. Then drop the titles for Section 4.8.3.1, Definitions, page 4-11 and Section 4.8.4 Comparison of Data Sets, page 4-11. Add *Representativeness* in this section. Finally, add and discuss *Comparability* to this section for a complete discussion of data quality indicators. These changes would bring the new Section 4.8.3 into compliance with the EPA document Guidance for Data Usability in Risk Assessment (Part A) Final (EPA, 1992).

Response

See text revisions in Sections 4.8.2 and 4.8.3.

NDEP Comment

26. Section 4.8.3.1, page 4-11, TRX states "Accuracy will be evaluated using percent recovery data." Insert the following text at the end of the sentence "from spiked samples."

Response

See text revision in Section 4.8.3.

NDEP Comment

27. Section 4.8.3.1, pg 4-11. TRX states "The completeness goal is the same for all data uses that a sufficient amount of valid data be generated to accomplish the objectives of the study. Standard methods of evaluation will be used to assess accuracy and precision data. Completeness can be quantitatively assessed simply by calculation of the percentage of valid data obtained." Please note that the completeness goal should be established as a percentage value before going into the field.

Response

See revised text in Section 4.8.3.

NDEP Comment

28. Section 5.2, page 5-1, it would be more appropriate to provide an updated version of the conceptual site model (CSM) than a stand-alone report. The new data that is collected must be incorporated into the site-wide data set. The NDEP believes that this issue can be discussed further in upcoming meetings, if necessary.

Response

Comment noted.

NDEP Comment

29. Sections 5.3 and 5.4, pages 5-1 and 5-2, it is not clear why TRX has not referenced the applicable USEPA guidance, it is expected that this issue can be discussed further in meetings.

Response

See text revisions in Sections 5.3 and 5.4.

NDEP Comment

30. Section 7.0, pg 7-1. "ASTM. 1990. Standard Practice for Description and Identification of Soils: D2488-84." Please note that ASTM has a more recent reference for this practice.

Response

See revisions to references listed in Section 7.0.

NDEP Comment

31. Table 5, the NDEP has the following comments:

- a. PCB analysis appears to be excluded from location SA-13. Please include this analysis at this location. Also, please note that this is contrary to the information presented on Tables 2 and 3.

Response

See corrections to Table 5.

NDEP Comment

32. Table 6, the NDEP has the following comments:

- a. PCB analysis appears to be excluded from location M-31A. Please include this analysis at this location. Also, please note that this is contrary to the information presented on Tables 2 and 3.

Response

See corrections to Table 6.

NDEP Comment

33. Tables 8 and 9, NDEP has not verified the accuracy of these tables as it is the responsibility of TRX.

Response

Comment noted.

Other:

Dioxin analyses in shallow surface samples will comprise a program wherein 100 percent will be screened using a modified EPA Method 8290 screen, and 10 percent will be analyzed using EPA Method 8290 to confirm screen results. See text revisions in Section 3.3, dioxins/dibenzofurans, and revisions to Tables 2, 3, and 5.

Meeting Minutes

Project: Tronox (TRX)
Location: NDEP – Las Vegas
Time and Date: 10:00 AM, April 5, 2007
Meeting Number: ---
In Attendance: NDEP-BCA – Brian Rakvica, Shannon Harbour
Tronox – Keith Bailey, Susan Crowley
Neptune – Paul Black (for NDEP)
Teri Copeland (for NDEP)
Hackenberry Assoc. – Paul Hackenberry (for NDEP)
ENSR – David Gerry, Lisa Bradley, Elizabeth Perry

CC: Jim Najima

1. The meeting was held to review the preliminary data generated during the Phase A Source Area Investigation (Phase A), and to discuss the framework of the Phase A Report and Phase B Work Plan (WP).
2. The Phase B WP will be included with Phase A Report.
3. Discussed Phase A Report:
 - a. Phase A data validation was in process at time of meeting, and the data presented, although preliminary, is not expected to undergo significant revision when finalized. TRX presented preliminary data tables for discussion purposes.
 - i. Dioxin/furans: Results of a screening evaluation resulted in 8 of 27 soil samples having detections greater than 50 ppt TEQs but less than 1,290 ppt TEQs. Seven of the 8 samples having concentrations greater than 50 ppt TEQs were also analyzed using the full EPA Method 8290. TRX noted that the screening method consistently reported concentrations approximately 10-30% higher than EPA Method 8290. TRX noted that all full 8290 method results were less than 1 ppb.
 - ii. Herbicides: not detected in soil or water.
 - iii. Metals: Soil and groundwater samples had detectable concentrations. Groundwater samples were collected from six open boreholes (two of which were filtered) and from 21 existing monitoring wells, which were collected with a low-flow pump (~100-500 ml/min) and not filtered. TRX noted that the sampling flow rates were within limits specified in the Work Plan; however, it appears that TRX personnel did not monitor the turbidity of the water to insure that the samples were representative. The filtered samples exhibited metals concentrations lower than the non-filtered samples for many metals. NDEP clarified that any time filtered samples are taken a duplicate unfiltered sample must be taken (per the approved SOP). In order to resolve the possibility of a bias introduced by the implementation of the sampling method, TRX proposes to resample the existing

monitoring wells using both lower flow rates to minimize turbidity, and filtered and unfiltered samples to examine the effects of turbidity. Based on these data, TRX will consider amending the existing Work Plan to specify a lower pump rate, and/or specify a stabilized target turbidity level prior to sampling. TRX will prepare a brief e-mail describing the proposed modification to the existing Work Plan and send it to the NDEP. This may occur prior to Phase A report submittal.

ACTION ITEM

- iv. Perchlorate: Soil and groundwater samples had detectable concentrations. TRX stated that the perchlorate concentrations in the soil and groundwater tracked with the delineated groundwater plume.
- v. Pesticides: BHC isomers and DDX isomers had detections in soil and groundwater mainly in the mid-western area of the plant site, which may be due to off-site sources.
- vi. Radionuclides: Soil and groundwater samples had detectable concentrations with several greater than the screening level. TRX stated that secular equilibrium is generally occurring and that there doesn't seem to be much influence from the properties off-site to the east. TRX noted several thorium detections in groundwater, which may be due to turbidity. TRX will resample as discussed in 3.a.iii. It is suspected that the acidified turbid samples are biasing metals and radionuclide concentrations high.
- vii. SVOCs: Soil and groundwater samples had very few detectable concentrations. In soil, no SVOCs were detected at concentrations greater than the PRG and only two constituents were detected at concentrations greater than 0.1 times the PRG. In groundwater, only 1 SVOC was detected, which exceeded the PRG.
- viii. VOCs: Soil and groundwater samples had detectable concentrations. In soil, only benzene and chloroform were detected at concentrations above 0.1 PRG and both were also detected above the PRG. Other chlorinated VOCs were also noted in groundwater. Some matrix effects were observed to affect detection limits in groundwater analyses. TRX reported that there were significant chloroform concentrations in groundwater observed on the western portion of the site with some samples also containing carbon tetrachloride.
- ix. TPH: Several soil samples had detectable diesel range TPH concentrations greater than 100 ppm.
- x. PCBs: One soil sample had detectable concentrations of Aroclor 1260 at 20 ft bgs but was under screening level of 1 ppm. TRX had the sample reanalyzed and the PCB detection was not confirmed. TRX was unable to specify a likely PCB source, and believes the single detection is not accurate.
- xi. Fuel alcohols: one groundwater sample had detectable ethanol concentrations.
- xii. Manganese Ore and Tailings: TRX stated that radionuclide concentrations were comparable to background. Arsenic was detected

- at a maximum concentration of 90 ppm. TCLP results were reported within acceptable limits.
- xiii. For soils, detection limits for non-detect results were below the PRG and, with one exception, below 0.1 times the PRG. Matrix effects resulted in elevated detection limits for some VOC analyses in groundwater.
- b. TRX presented preliminary lists of contaminants not detected in soil and groundwater, respectively. TRX proposed that compounds not detected in the Phase A data above the comparison values be considered for elimination from future characterization. For soil, the comparison value was 0.1 times the industrial soil PRG. For groundwater, TRX used 0.1 times the MCL (Nevada, then federal) or, if no MCL, the PRG (and 0.1 times the PRG) for comparison values for each constituent. The following were specifically discussed during the meeting:
 - i. Dioxin/furans – Due to the very low detected concentrations, TRX proposes that dioxin/furans be eliminated from consideration in subsequent Phase B Site Investigations.
 - ii. SVOCs – Due to very few detections and the very low detected concentrations, TRX proposes that SVOCs be eliminated from consideration in subsequent Phase B Site Investigations.
 - iii. TRX noted that available resources would be optimized by focusing on the drivers and compounds exceeding the screening thresholds and eliminating the inclusion of other non-detected compounds commercially available in specific laboratory analytical suites. Focusing on key compounds will save resources otherwise spent on extensive data validation and data management.
 - iv. The NDEP commented that if only certain analytes are eliminated from an analytical suite the situation will arise that data will be generated that is not being reported. The NDEP suggested that the analytical lab sheets be included in an appendix. TRX expressed concerns about having to address detections of a constituent that has been eliminated using comparison values.
 - v. NDEP expressed additional, potentially legal concerns about the potential risks of generating data and not reporting it.
 - vi. NDEP and TRX to consider solutions to this issue. **ACTION ITEM**
 - c. TRX presented summary tables of statistics for soil and groundwater, respectively, which included frequency of detection, maximum concentration detected, PRGs, and 0.1 times both the PRGs and MCLs. NDEP commented that location information and detection limits also must be considered in decision making. In addition, for report submission, columns must be added for detection limits. TRX indicated that the analytical information provided is preliminary and that the Phase A report will contain the detection limits and location information.
 - i. Aluminum, arsenic, total chromium, chromium VI, iron, lead, manganese and hexavalent chromium had maximum detected concentrations greater than 0.1 times their respective PRGs in soil.

- ii. Arsenic additionally had a maximum detected concentration greater than the PRG. TRX noted that the aluminum and arsenic concentrations, as well as other metals, generally increased with depth.
 - iii. TRX noted that the reference dose for iron has been increased, which results in the iron concentrations being less than 0.1 the recalculated PRG for iron.
 - d. 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. TRX indicated that they were considering dividing the site into sub-areas based on exposure. NDEP commented that the exposure would have to be consistent (i.e., equal access) across the entire sub-area.
 - e. TRX noted that the asbestos analyses have been completed. Although TRX is well aware of the existing EPA guidance and emerging EPA strategies for dealing with asbestos risk, there remains some confusion between published techniques regarding evaluation of asbestos risks. TRX requested clarification from the NDEP on how the data are to be evaluated and reported.
 - i. NDEP noted that BRC has screening criteria based on dimension of fibers and that only the type and number of fibers are reported.
 - ii. NDEP will send EPA guidance and NDEP's summary of the guidance to TRX. **ACTION ITEM**
 - iii. NDEP will forward BRC contact information for asbestos evaluations (Mark Jones with ERM) to TRX. **ACTION ITEM**
 - iv. TRX will send a copy of an asbestos lab report to NDEP/Neptune for review. **ACTION ITEM**
 - f. TRX will request to have Rad²²⁶ or Rad²²⁸ as an indicator compound for radionuclides. NDEP commented that TRX will need to demonstrate secular equilibrium for approval.
4. Discussed Phase B WP:
- a. NDEP requested that TRX address soil gas issues in the Phase B WP if applicable to future site uses.
 - b. TRX will propose preliminary exposure areas in Phase B WP as discussed above.
 - c. TRX noted that due to the low frequency of detection and levels of concentration reported, a 'step-out' approach to Phase B may be less useful and less productive than focusing on filling data gaps within each of the identified exposure areas.
 - i. It was noted by the NDEP that random sampling within an exposure area may be the most appropriate approach. This approach will be taken into consideration for the Phase B Work Plan, which will be included as part of the Phase A report.
 - ii. NDEP noted that data adequacy will need to be addressed as exposure areas are defined and the data is examined.
 - d. Once the Phase B WP is submitted, TRX noted that to meet the proposed schedule, the NDEP review must be conducted as quickly as possible to avoid delay in conducting the field work.

- e. TRX noted that they may consider using a mobile lab with 10% of samples additionally sent to a certified lab for confirmation. NDEP stated that they are aware of certified mobile labs being used elsewhere on the BMI complex.
5. Discussed Upgradient Report
 - a. TRX will submit a line by line response to NDEP's comments. TRX proposed that the document revisions be limited to an added discussion on the statistics and the box and whisker plots (exploratory data analysis) and revisions to the conclusions and executive summary.
 - b. TRX suggested that NDEP allow the revisions be submitted as replacement pages to the Upgradient Report.
 - c. Once determined, TRX will send e-mail to NDEP with the expected submittal date. **ACTION ITEM**
6. TRX noted that as iterative risk evaluations are completed, some of the more useful findings will be shared with NDEP for the purposes of preliminary discussion and review.
7. TRX clarified that future land use will remain commercial/industrial.
8. It was clarified that any database submitted will be in MS Access format.
9. NDEP found the BRC Data Usability Table useful and will send it along with related comments as an example for TRX. **ACTION ITEM**
10. TRX requested that a monthly conference call be scheduled with NDEP. It was agreed that this may be on May 8, 2007. **ACTION ITEM**
11. TRX to send 2 copies of the aerial photo with Phase A SOW and Phase A boring location maps to NDEP and NDEP's contractors to facilitate monthly conference call. Additional items should be forwarded as necessary to facilitate a productive discussion. **ACTION ITEM**
12. Phase I Report for potential TRX land sales: TRX suggested that the parcels discussed in the Phase I report may be divided into sub-areas using exposure criteria. NDEP stated that this should be discussed at another meeting.
13. Risk assessment discussion.
 - a. Discussed leaching pathway. TRX noted that the numerical screening, summarized above, covers direct exposure rather than the soil to groundwater pathway. Determination of leaching pathway risk will depend on CSM, future use, and current exposure areas and will be considered in the Phase A report.
 - b. NDEP noted that groundwater is a receptor and must be considered as such.
14. Discussed upgradient and background data/comparisons.
 - a. Noted that the following tests should be utilized, as appropriate:
 - i. T test
 - ii. Wilcoxon Rank Sum test with Gehan modification.
 - iii. Quantile test
 - iv. Slippage test
 - b. Discussed the need to perform exploratory data analysis and use the tests to support conclusions.
 - c. Review of histograms shows that inclusion of the TRX data set for shallow Upgradient conditions with the BRC/TIMET data set will not likely change the background range. If this inclusion is completed, NDEP may perform the

analyses. Noted that the deep soils data is not yet available from BRC and this issue will require additional considerations.

- d. Discussed adjustment of the significance level. Noted that the significance level is only a guide.
 - e. Noted that in the Upgradient data the concentrations increase with: depth, geology change, and % fines.
 - f. Discussed DVSR included in Upgradient report. NDEP noted that this report was generally acceptable.
15. Discussed tentative schedule.
- a. Phase A Report/Phase B Work Plan – June or July 2007
 - b. Phase B sampling – late 2007
 - c. Risk Assessment – mid-2008

Caceres-Schnell, Carmen

From: Brian Rakvica [mailto:brakvica@ndep.nv.gov]
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 consecutive 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

8/22/2007

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

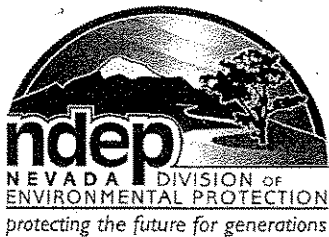
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STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

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

May 21, 2007

Mr. Mark Paris
Basic Remediation Company
875 West Warm Springs Road
Henderson, NV 89011

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

Mr. Larry Landry
Pioneer Companies, Inc.
700 Louisiana St, Ste 4300
Houston, TX 77002

Mr. Joe Kelly
Montrose Chemical Corp of CA
600 Ericksen Ave NE, Suite 380
Bainbridge Island, WA 98110

Mr. Brian Spiller
Stauffer Management Co LLC
1800 Concord Pike
Wilmington, DE 19850-6438

Mr. Craig Wilkinson
Titanium Metals Corporation
PO Box 2128
Henderson, NV 89009

Re. **BMI Plant Sites and Common Areas Projects, Henderson, Nevada**
Additional Guidance on Completion of Quality Checks for Cation-Anion Balance

Dear Sirs and Madam:

In response to questions from several of the parties listed above, Attachment A is a document which provides additional guidance on the completion of quality checks for cation-anion balances. This guidance should be shared with your respective analytical laboratory and should be reflected in any data validation that is completed.

Please contact me with any questions (tel: 702-486-2850 x247; e-mail: brakvica@ndep.nv.gov).

Sincerely,

Brian A Rakvica, P.E.
Supervisor, Special Projects Branch
Bureau of Corrective Actions

BAR:s



CC: Jim Najima, NDEP, BCA, Carson City
Marysia Skorska, NDEP, BCA, Las Vegas
Shannon Harbour, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Greg Lovato, NDEP, BCA, Carson City
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
Ranjit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nicholas Pogoncheff, PES Environmental, Inc., 1682 Novato Blvd., Suite 100, Novato, CA
94947-7021
Lee Erickson, Stauffer Management Company LLC, P.O. Box 18890 Golden, CO 80402
Keith Bailey, Tronox, Inc, PO Box 268859, Oklahoma City, Oklahoma 73126-8859
Jeff Gibson, AMPAC, 3770 Howard Hughes Parkway, Suite 300, Las Vegas, Nevada 89109
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
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
Jon Erskine, Northgate Environmental Management, Inc., 300 Frank H. Ogawa Plaza, Suite 510,
Oakland, CA 94612
Deni Chambers, Northgate Environmental Management, Inc., 300 Frank H. Ogawa Plaza, Suite
510, Oakland, CA 94612
Robert Infelise, Cox Castle Nicholson, 555 Montgomery Street, Suite 1500, San Francisco, CA
94111
Michael Ford, Bryan Cave, One Renaissance Square, Two North Central Avenue, Suite 2200,
Phoenix, AZ 85004
Dave Gratson, Neptune and Company, 1505 15th Street, Suite B, Los Alamos, NM 87544
Paul Black, Neptune and Company, Inc., 8550 West 14th Street, Suite 100, Lakewood, CO 80215
Teri Copeland, 5737 Kanan Rd., #182, Agoura Hills, CA 91301
Paul Hackenberry, Hackenberry Associates, 550 West Plumb Lane, B425, Reno, NV, 89509

Attachment A

The analytical parameters that are included for the groundwater samples analyzed at the BMI complex include the major cation and anions along with a measured Total Dissolved Solids (TDS) value. Based on the evaluation of previous data collected at the site, using Standard Methods (Standard Methods for the Examination of Water and Wastewater, 20th Edition, January 1999) Section 1030 E for Correctness of Analyses, it appears numerous samples do not meet the quality checks. The quality checks employed included anion-cation balance, measured TDS to calculated TDS ratio, and measured TDS to EC ratio. These checks were made via the spreadsheet application that had previously been developed by Hackenberry Associates, LLC for the construction of Piper Trilinear diagrams.

Geochemical checks on correctness of analysis were made at three different sites at the BMI Complex. For the example herein, the analytical results were checked for 40 groundwater samples from the 2004 Hydrogeologic Characterization Summary (BRC, 2004, Table 3-24). The check for accuracy of analysis included 17 wells completed in the alluvial aquifer (Aa) and 23 wells completed in the Muddy Creek Formation (MCf).

The anion-cation balance check included major cations and anions as listed below:

1. calcium,
2. magnesium,
3. sodium,
4. potassium,
5. sulfate,
6. chloride,
7. bicarbonate and carbonate, and
8. hydroxide.

Hydroxide alkalinity, although uncommon in natural groundwater (Hem, 1992, p. 64), was added because the pH values were quite high for a number of samples and the hydroxide values were also very high. Fluoride, nitrate, and perchlorate were also included in the anion-cation balance calculation, but were not included in the calculation of percentages for the Piper Trilinear diagrams. The latter three analytes were added more for completeness based on site history than for contribution to the anion-cation balance, because their percentages were less than one percent of total anions. Trace metals were not included in the calculations for the same rationale. Analytes measured in the microgram per liter range would likely not significantly affect the balance outcome. Only four of the 17 samples from the Aa had anion-cation balances within the error limits specified in Standard Methods. Only seven of the 23 samples from the MCf had anion-cation balances within the error limits specified in Standard Methods. The anion-cation balance for three of the samples from the MCf was not verified because their anion sum was beyond the range provided in Standard Methods. Almost all the total dissolved solids values (40 of 49) in Table 3-24 were "J" flagged.

Based on the numerous instances in which the correctness of the analyses did not meet the Standard Method criteria it is recommended that in the future the laboratories performing these analyses also perform the correctness test. When the correctness test is violated, the laboratory should follow the Standard Method recommendations and evaluate the data for error and, if necessary, re-analyze the

samples. If the results of any corrective action are not sufficient, then the data that does not meet these quality checks should be qualified. For example, based on the electronuetrality and TDS checks there are four potential outcomes:

1. Cation-anion balance checks & TDS sum versus TDS measured checks.
2. Cation-anion balance checks & TDS sum versus TDS measured does not check.
3. Cation-anion balance does not check & TDS sum versus TDS measured checks.
4. Cation-anion balance does not check & TDS sum versus TDS measured does not check.

When the quality checks result in outcomes numbered 2 and 3, the data should be qualified using a designation that is specific to the quality issue. When the quality checks result in outcome number 4, the data should be qualified as unreliable. The following qualifier designations are recommended for outcomes 2, 3, and 4:

2. J-TDS
3. J-CAB
4. J-TDS&CAB

NDEP Comments on Interim Deliverables Provided by TRX on 7/6/7

1. Phase B sampling should consider historic data. While this data has not been validated, it cannot be ignored. For example, TPH issues in the vicinity of the tank farm. Has the extent of contamination been delineated in this area? No.
2. Phase B sampling cannot complete the phased RI because “nature and extent” have not been defined. TRX should seriously consider this as remedy selection may be faulty. This is a fundamental part of completing an RI and risk assessment cannot proceed based on statistics in a vacuum.
3. Table 5-16, the NDEP has the following comments:
 - a. Please explain the basis of the “MCL” reference in the footnote.
 - b. NDEP has not verified the values in this table or any others.
4. Figure 4-16, the NDEP has the following comments:
 - a. It would seem that soil gas samples should be biased towards the area of highest contamination (the western side of the property).
 - b. Regarding the depth of the sample, NDEP is reviewing. If TRX has guidance from USEPA on this it would be helpful.
 - c. Based upon a review of this Figure, TRX implies that GW is the primary source. Since the soil data is not presented it is difficult for the NDEP to concur.
5. Table – Soil Gas, the NDEP has the following comments:
 - a. TRX should complete the broad suite analysis for each suite selected. For example, VOCs should include analysis for all of the VOCs in the standard suite. This issue has also been raised for soils and groundwater. NDEP’s response is the same.
 - b. The rationale for this (for all media) is as follows:
 - i. Analytical services provide the full suite of analytes at the same cost as for a paired down suite.
 - ii. In the experience of the NDEP, when a lab reports a paired down suite the probability of errors in reporting is high.
 - iii. It is more cost effective to report the full suite of analytes than to provide detailed justification during future reporting (and risk assessment) to explain why this full suite was not completed.
 - iv. The added cost of data management for these analytes is “nominal” and in the opinion of the NDEP, does not warrant further discussion. If this price difference is not nominal it is likely that the lab or the project consultant is in error.
 - v. Since the level of investigation is somewhat preliminary it is conservative and judicious to error on the side of the broader suite. It will be cost prohibitive and ineffective to resample for a few problem analytes in the future.
6. Table 5-14, the NDEP has the following comments:
 - a. The issue of the selected DAF for the leaching pathway must be resolved before NDEP and TRX can move forward. **It would not be productive to meet until resolution is reached on this issue.**
 - b. NDEP will not review this table until the DAF issue is resolved.

- c. TRX must provide select portions of the references listed for this table. Specifically, the relevant portions of the 1st, 2nd and 4th references. If TRX chooses not to provide these the NDEP's review will be prolonged.
 - d. TRX must reference where the site-specific data was presented.
 - e. NDEP does not concur with the selection of the DAF 20 for comparison of the leaching pathway. Reasoning follows:
 - i. The soil to groundwater pathway has been shown to be complete for any number of contaminants that exist in groundwater.
 - ii. Examination of data collected during Phase II shows contamination through the soil column for several contaminants.
 - iii. The level of investigation for many of the contaminants is preliminary. Selection of the DAF 20 is not conservative.
 - iv. The DAF 1 specified in the USEPA technical background document is valid for the reasons provided by USEPA. TRX has not provided any reasons to validate the selection of DAF 20.
 - v. Selection of the DAF1 may not result in any additional suites being added to the evaluation. See additional reasons above re: use of complete suites during analyses.
 - vi. TRX should be able to complete adequate QC in-house without NDEP's line by line review of these tables. If this cannot be done perhaps the quality of services provided by ENSR should be evaluated.
7. Table 5-20A, the NDEP has the following comments:
- a. Note "(f)" states that comparison levels were not developed for the soil to groundwater leaching pathway for radionuclides. This is problematic in that elevated levels of uranium are noted in the groundwater. In addition, lack of a comparison level limits the ability of TRX to determine if these compounds have been adequately characterized. Kd values exist and should be used to developed comparison levels.
 - b. It is difficult for the NDEP to concur with some of the reasoning on this table in that it refers the reviewer to the text.
8. Materials requested for next meeting as follows:
- a. Table listing source areas and suites of contaminants associated with each source area.
 - b. Figure showing source areas and boring/well locations (including historic).
 - c. Any Figure showing soil or groundwater data should also show the sources.

**Tronox response to NDEP Comments on Interim Source Area Report Deliverables
Provided July 6, 2007**

NDEP Comment:

1. Phase B sampling should consider historic data. While this data has not been validated, it cannot be ignored. For example, TPH issues in the vicinity of the tank farm. Has the extent of contamination been delineated in this area? No.

Tronox Response:

The historic data has been used for input to the Phase B assessment.

NDEP Comment:

2. Phase B sampling cannot complete the phased RI because "nature and extent" have not been defined. TRX should seriously consider this as remedy selection may be faulty. This is a fundamental part of completing an RI and risk assessment cannot proceed based on statistics in a vacuum.

Tronox Response:

It is understood that additional sampling will be necessary following the completion of Phase B. The RI Risk assessment will be conducted consistent with guidance and with consideration of available site history and site data.

NDEP Comment:

3. Table 5-16, the NDEP has the following comments:
 - a. Please explain the basis of the "MCL" reference in the footnote.
 - b. NDEP has not verified the values in this table or any others.

Tronox Response:

3a. The basis of MCL will be provided.

3b. The tables were provided for use and it is understood that NDEP has not verified the values.

NDEP Comment:

4. Figure 4-16, the NDEP has the following comments:
 - a. It would seem that soil gas samples should be biased towards the area of highest contamination (the western side of the property).
 - b. Regarding the depth of the sample, NDEP is reviewing. If TRX has guidance from USEPA on this it would be helpful.
 - c. Based upon a review of this Figure, TRX implies that GW is the primary source. Since the soil data is not presented it is difficult for the NDEP to concur.

Tronox Response:

4a. We wanted to discuss the placement of soil vapor samples at the meeting with the map in front of the group.

4.b Guidance regarding the 10 foot bgs depth will be provided.

4c. Soil data maps will be jointly presented with groundwater data.

NDEP Comment:

5. Table – Soil Gas, the NDEP has the following comments:
 - a. TRX should complete the broad suite analysis for each suite selected. For example, VOCs should include analysis for all of the VOCs in the standard suite. This issue has also been raised for soils and groundwater. NDEP's response is the same.
 - b. The rationale for this (for all media) is as follows:

- i. Analytical services provide the full suite of analytes at the same cost as for a paired down suite.
- ii. In the experience of the NDEP, when a lab reports a paired down suite the probability of errors in reporting is high.
- iii. It is more cost effective to report the full suite of analytes than to provide detailed justification during future reporting (and risk assessment) to explain why this full suite was not completed.
- iv. The added cost of data management for these analytes is "nominal" and in the opinion of the NDEP, does not warrant further discussion. If this price difference is not nominal it is likely that the lab or the project consultant is in error.
- v. Since the level of investigation is somewhat preliminary it is conservative and judicious to error on the side of the broader suite. It will be cost prohibitive and ineffective to resample for a few problem analytes in the future.

Tronox Response:

5a. Soil vapor will be analyzed for the standard TO-15 broad suite analysis

5b Although Tronox may not completely agree with all the statements under 5b the soil vapor will be analyzed for the standard TO-15 broad suite analysis as stated above.

NDEP Comment:

6. Table 5-14, the NDEP has the following comments:
- a. The issue of the selected DAF for the leaching pathway must be resolved before NDEP and TRX can move forward. **It would not be productive to meet until resolution is reached on this issue.**
 - b. NDEP will not review this table until the DAF issue is resolved.
 - c. TRX must provide select portions of the references listed for this table. Specifically, the relevant portions of the 1st, 2nd and 4th references. If TRX chooses not to provide these the NDEP's review will be prolonged.
 - d. TRX must reference where the site-specific data was presented.
 - e. NDEP does not concur with the selection of the DAF 20 for comparison of the leaching pathway. Reasoning follows:
 - i. The soil to groundwater pathway has been shown to be complete for any number of contaminants that exist in groundwater.
 - ii. Examination of data collected during Phase II shows contamination through the soil column for several contaminants.
 - iii. The level of investigation for many of the contaminants is preliminary. Selection of the DAF 20 is not conservative.
 - iv. The DAF 1 specified in the USEPA technical background document is valid for the reasons provided by USEPA. TRX has not provided any reasons to validate the selection of DAF 20.
 - v. Selection of the DAF 1 may not result in any additional suites being added to the evaluation. See additional reasons above re: use of complete suites during analyses.
 - vi. TRX should be able to complete adequate QC in-house without NDEP's line by line review of these tables. If this cannot be done perhaps the quality of services provided by ENSR should be evaluated.

Tronox Response:

6a The DAF 1 vrs DAF 20 will be evaluated on a constituent by constituent basis. Wwe hoped to discuss this at the meeting.

6b. Tronox will work with NDEP to resolve the DAF question.

6c. The requested references will be provided.

6d. A reference to where the site specific data was presented will be provided.

6e. Tronox provided the tables to NDEP for their information. Tronox and ENSR are not relying on NDEP for QA review, we wanted NDEP to provide feedback regarding if they agree with the process used to arrive at the numbers selected. A good example is the DAF 20 issue. NDEP does not agree with that logic so Tronox will revisit it.

NDEP Comment:

7. Table 5-20A, the NDEP has the following comments:
- a. Note "(f)" states that comparison levels were not developed for the soil to groundwater leaching pathway for radionuclides. This is problematic in that elevated levels of uranium are noted in the groundwater. In addition, lack of a comparison level limits the ability of TRX to determine if these compounds have been adequately characterized. Kd values exist and should be used to developed comparison levels.
 - b. It is difficult for the NDEP to concur with some of the reasoning on this table in that it refers the reviewer to the text.

Tronox Response:

7a. Comparison levels for the soil to groundwater leaching pathway will be developed for radionuclides.

7b. Tronox understands that a full review cannot occur until the report is submitted.

NDEP Comment:

8. Materials requested for next meeting as follows:
- a. Table listing source areas and suites of contaminants associated with each source area.
 - b. Figure showing source areas and boring/well locations (including historic).
 - c. Any Figure showing soil or groundwater data should also show the sources.

Tronox Response:

8a. The tables from the Conceptual Site Model Report, that contain the soil and groundwater samples collected at each LOU are being included in an appendix to the Phase A report. Table 1 from the Source Area investigation workplan will also be included.

8b. The figures from the Conceptual Site Model Report showing the locations of historic samples and boreholes will be included.

8c. Figures showing the suspected source areas will be included in the report. Depending on the density of other information it may not be possible to have the suspected source areas on all maps.

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 provide 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 calculate 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.

FINAL

- 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.**

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 (1/10th 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 than 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 were 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.**