Prepared for:
Tronox LLC
Henderson, Nevada

Phase B Source Area Investigation Work Plan
Area I (Northern LOUs)
Tronox LLC Facility
Henderson, Nevada

ENSR Corporation
April 2008
Document No.: 04020-023-430 – I

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TRONOX

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April 3, 2008

Ms. Shannon Harbour, P.E.
Nevada Division of Environmental Protection
2030 East Flamingo Road, Suite 230
Las Vegas, Nevada 89119-0818

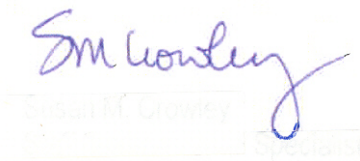
Subject: Phase B Source Area Investigation - Soil Gas Survey Work Plan
Tronox LLC, Henderson, Nevada

Dear Ms. Harbour:

Tronox LLC (Tronox) has undertaken an Environmental Conditions Assessment (ECA) as directed by the Nevada Division of Environmental Protection (NDEP). Towards this work, Tronox has prepared the attached *Phase B Source Area Investigation - Soil Gas Survey Work Plan, Tronox LLC, Henderson Nevada*. This is one of six work plans which will provide information to be used in assessing soil, soil gas and groundwater impacts at the Tronox Henderson facility.

Please contact me at (702) 651-2234 if you have any comments or questions concerning this correspondence.

Sincerely,



Susan M. Crowley
Staff Environmental Specialist

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Phase B Source Area Investigation
Work Plan – Area I
Tronox LLC Facility
Henderson, Nevada

Responsible CEM for this project

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and, to the best of my knowledge, comply with all applicable federal, state and local statutes, regulations and ordinances.

Susan M. Crowley, CEM 1428 exp. date 3/8/09
Staff Environmental Specialist
Tronox LLC

Technical Contributions by:

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Michael Flack, PG
Brian Ho, CEM
Carmen Schnell, PG
Robert Kennedy

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ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
AP	Ammonium Perchlorate
ASTM	American Society for Testing and Materials
bgs	below ground surface
BMI	Black Mountain Industrial
BRC	Basic Remediation Company
CD	compact disc
CEM	Certified Environmental Manager
CLP	Contract Laboratory Program
CSM	Conceptual Site Model
DOT	Department of Transportation
ECA	Environmental Conditions Assessment
EDD	electronic data deliverable
eV	electronic volt
FID	flame-ionization detector
ft/ft	feet per foot
HASP	Health and Safety Plan
HHRA	Human Health Risk Assessment
IDW	Investigation-Derived Wastes
LOU	Letter of Understanding
MCL	Maximum Contaminant Level
ml	milliliter
MS/MSD	matrix spike/matrix spike duplicate
NDEP	Nevada Division of Environmental Protection
NELAP	National Environmental Laboratory Accreditation Program
NTUs	nephelometric turbidity units
OCPs	organochlorine pesticides
OPPs	organophosphorus pesticides
PDF	Portable Document File
PID	photoionization detector
PRGs	Preliminary Remediation Goals
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
QC	quality control

ABBREVIATIONS AND ACRONYMS (continued)

RL	Reporting Limit
RPD	relative percent difference
SAPs	sampling and analytical plans
SOPs	standard operating procedures
SPLP	Synthetic Precipitation Leaching Procedure
SRCs	site-related chemicals
TDS	total dissolved solids
Tronox	Tronox LLC
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
%RSD	percent relative standard deviation

1.0 Introduction

This document presents the Area I Work Plan (Work Plan) which is part of the Phase B Source Area Investigation at the Tronox LLC (Tronox) facility located within the Black Mountain Industrial (BMI) Complex in Henderson, Nevada (the Site). The Site is owned and operated by Tronox, headquartered in Oklahoma City, Oklahoma. Tronox was formerly known as Kerr-McGee Chemical LLC. The Source Area Investigation, including Phase A and Phase B, is being conducted under the regulatory oversight of the Nevada Division of Environmental Protection (NDEP) and is being submitted as part of the Environmental Conditions Assessment (ECA) as required by NDEP (2004).

The Phase B activities follow the Phase A Source Area Investigation (ENSR 2007b) and are intended to further characterize soil and groundwater conditions at the source areas within the roughly 450-acre Site **(Figure 1)**.

At the request of the NDEP, the Phase B Source Area Investigation field activities have been segmented into investigations of soil gas, soil and groundwater, and background groundwater conditions with each segment requiring separate, stand-alone work plans that describe the goals, scope of work, and methods used to implement each investigation.

To investigate the approximately 70 source areas on the Site and their potential affect on soil conditions, the Site has been subdivided into four "Areas" (Area I, II, III, and IV) as shown on **Figure 2**. The Phase B soil investigation does not include investigation of soils in Parcels A through D, F, G, and H (see **Figure 2**), which are for sale and are being investigated by the Basic Remediation Company (BRC) independent of Tronox's Phase B Source Area Investigation. (Parcel E consists of land that is jointly used by Montrose Chemical and others, and evaluation of this parcel will be addressed at a later date. Soil investigations of Parcels I and J are being conducted by the tenants of those parcels independent of Tronox's Phase B Source Area Investigation.)

Whereas the Site has been subdivided into four Areas for the soil investigation, Tronox will evaluate groundwater conditions and soil gas on a Site-wide basis including Parcels A through D, and F through J.

Individual work plan documents have been prepared that describe the scope of work to investigate each of the four Areas. This document presents the Work Plan to investigate soil and groundwater conditions in Area I, and also groundwater conditions in the area north of Area I (Parcels A through D, I, and J). A separate work plan to evaluate soil gas and the vapor intrusion pathway for the entire Site has been prepared (ENSR 2008b). This work plan was approved with conditions by the NDEP on March 26, 2008.

The four Area investigation work plans focus on evaluation of potential source areas for the Site-Related Analytes as shown on **Table 1**, (which was updated and forwarded to NDEP on March 18, 2008; Tronox 2008). (The site-related analytes, herein after referred to as site-related chemicals [SRCs], vary slightly from the full list of SRCs addressed in previous reports.) Potential source areas were identified by the NDEP in their August 15, 1994 Letter of Understanding (LOU). Seventy areas have been identified as potential source areas on the Tronox Site. Sixty-nine areas are formally designated as LOUs (i.e., LOU 1 through LOU 69). An area identified as the former U.S. Vanadium Site has not been designated an LOU, but is considered herein as the 70th potential source area. Of the 70 potential source areas on the Site, 13 are within Area I as shown in **Figure 3** and as listed below):

- LOU-1 – Former Trade Effluent Settling Ponds Area

- LOU-2 – Open Area South of the Former Trade Effluent Settling Ponds Area
- LOU-10 – Former Hazardous Waste Landfill (Closed)
- LOU-22 – Pond WC-West and Associated Piping
- LOU-23 – Pond WC-East and Associated Piping
- LOU-32 – Chromium and Perchlorate Groundwater Remediation Unit Area
- LOU-35 – Former Truck Emptying/Dumping Site
- LOU-38 – Former Satellite Accumulation Point, Ammonium Perchlorate (AP) Laboratory
- LOU-39 – Satellite Accumulation Point, AP Maintenance Shop
- LOU-54 – AP Plant Area Change House/Laboratory Septic Tank Area
- LOU-58 – AP Plant Area – New Building D-1 Wash Down
- LOU 60 – Portion of the Former Acid Drain System
- LOU-64 – Former Koch Materials Company Site

The network of pipelines that make up the former Acid Drain System (LOU 60) is located between the Unit Buildings (1 through 6) and the Former Trade Effluent Settling Ponds Area (LOU 1) **(Figure 3)**. For the Area I Work Plan, only the portion of the system that is located within the Area I boundary will be discussed and evaluated. The other portions of the Acid Drawn System will be included, as appropriate, in the other three area work plans. The Area I Work Plan includes a compilation of individual sampling and analysis plans for each of the 13 LOUs that are presented in **Appendix A**. The LOUs adjacent to Area I are also shown on **Figure 3,** and will be addressed in Work Plans for Areas II, III and IV.

It is important to note that the Work Plan for Area I is designed to investigate both soil and groundwater within the Area, and also groundwater beneath Tronox sale Parcels north of Area I (**Figure 3**). Results of the BRC soil investigations on Tronox sale Parcels A, B, C, D, F and G will be incorporated into the final Phase B Source Area Investigation report. For example, soil borings completed by BRC north of the Former Trade Effluent /Settling Ponds Area (LOU-1) will be considered in evaluating possible migration of pond constituents.

1.1 Purpose and Objectives

The purpose of this Area I Work Plan is to describe the assessment of each potential source area, the sampling and data-gathering methods to be used, the locations to be sampled, the rationale for the locations proposed, and the analytical methodologies to be employed for the Phase B Source Area Investigation of Area I.

The objective of the Area I investigation is to gather information on the nature and extent of SRCs that may have been released to the environment in each of the respective potential source areas. Additionally, the scope-of-work has been designed to gather information for human health risk-based decision-making purposes. As such, samples of soil and groundwater will be collected and analyzed to support the evaluation of potential routes of exposure (e.g., direct contact pathway, soil-to-groundwater pathway, and groundwater pathway) in an industrial/commercial setting. The evaluation of the potential for migration of volatile organic compounds (VOCs) that may migrate from groundwater and/or soil to indoor air will be evaluated on a Site-wide basis under a separate soil gas work survey plan (ENSR 2008b) as noted above.

The distribution of sampling locations is designed in part to evaluate potential sources within each LOU and to provide general coverage within each Area supporting the planned future risk assessment, assuming that the receptors have equal probability of contacting environmental media within operationally (or on other basis) defined exposure areas of the Site. To evaluate source areas, proposed soil borings are placed at locations where constituents are anticipated to occur in soil at the highest concentrations or "worst case scenario" for most source areas. In a few cases, where containment structures cover "worst case" locations, sampling is proposed adjacent to the containments. Soil borings are also placed in locations outside the boundary of LOUs to gain additional insight into the horizontal extent of constituents in soil. The number of samples to be collected from Area I is designed to provide a large enough statistical sample population to allow for completion of the planned risk assessment program.

Data from the investigation will be combined with data from the other Area investigations to determine the distribution and sizing of evaluation areas that will be used to assess the risk to human health. The evaluation area layout and distribution will be based on current or planned operational areas, the SRC data, and chemical concentration and distribution across the Site. A screening level risk assessment will be performed using preliminary remediation goals (PRGs) (USEPA 2004) for each of the source areas, prior to conducting a Site-wide human health risk assessment (HHRA). This screening level risk assessment will consist of a simple comparison of the sample analytical results to the PRGs, which is in essence, the first step (Hazard Identification) of the full four-step risk assessment process.

Supplemental activities may be needed to collect data necessary to characterize the nature and extent of the SRC parameters that are inadequately characterized through Phase A and Phase B Source Area Investigations. If supplemental investigation activities become necessary, a work plan outlining additional recommended characterization work will be developed for NDEP review and approval.

1.2 Documents of Record

Previously prepared planning documents for the BMI Common Areas in general, and the Site in particular, have been reviewed and approved by the NDEP. These documents are considered documents of record and are referenced as appropriate herein to refer the reader to detailed prior discussions on Site conditions and information used to develop the LOU data packages and sampling and analysis plans. These documents include the following:

- *Environmental Conditions Assessment* (Kleinfelder 1993);
- *Response to Letter of Understanding, Henderson, Nevada Facility* (Kerr-McGee 1996);
- *Phase II Environmental Conditions Assessment, Kerr-McGee Chemical LLC, Henderson, Nevada* (ENSR 1997);
- *Conceptual Site Model, Kerr-McGee Facility, Henderson, Nevada* (ENSR 2005);
- *Upgradient Investigation Work Plan , Tronox LLC Facility, Henderson, Nevada Site* (ENSR 2006a);
- *Upgradient Investigation Work Plan Addendum, LLC Facility, Henderson, Nevada Site* (ENSR 2006b);

- *Phase A Source Area Investigation Work Plan, LLC Facility, Henderson, Nevada Site* (ENSR 2006c);
- *Upgradient Investigation Results Report, LLC Facility, Henderson, Nevada Site* (ENSR 2006e);
- *Addendum to the Phase A Source Area Investigation Work Plan, LLC Facility, Henderson, Nevada Site* (ENSR 2007a)*;*
- *Phase A Source Area Investigation Results Report, Tronox LLC Facility, Henderson, Nevada* (ENSR 2007b); and
- *Revisions to the Upgradient Investigation Results*, *LLC Facility, Henderson, Nevada Site* (ENSR 2007c).

Additional documents that have been prepared to define field procedures and protocols, quality assurance and control (QA/QC), and health and safety are as follows:

- *Basic Remediation Company (BRC) Field Sampling and Standard Operating Procedures for the BMI Common Areas* (BRC 2007).
- *Health and Safety Plan (HASP) Revision 3* (ENSR 2008a).
- *Quality Assurance Project Plan (QAPP), Tronox LLC Facility, Henderson, Nevada* (ENSR 2006d, revised 2008 [in preparation]).

1.3 Project Organization

The Tronox project manager is Susan Crowley. Ms. Crowley is a Nevada-Certified Environmental Manager (CEM # 1428, expiring March 8, 2009) and is the person who serves as the point of contact for regulatory and environmental issues pertinent to the Site. She is located at the Tronox Henderson Facility. Her telephone number is (702) 651-2234. Ms. Crowley manages the consultants and subcontractors that will be performing the tasks described in this Work Plan. Ms. Crowley will be supported by Tronox hydrogeologist Mr. Tom Reed.

ENSR Corporation is Tronox's environmental consultant. Mr. Michael Flack (Senior Program Manager and Hydrogeologist), Dr. Keith Bailey of Environmental Answers LLC (Engineer), Dr. Lisa Bradley (Senior Toxicologist), Brian Ho, CEM (Phase B Investigation Team Leader and Field Manager), Elizabeth Perry (Geostatistician), and Robert Kennedy (Senior Chemist and Data Quality Assurance/Quality Control [QA/QC] Officer) comprise ENSR's senior team, who along with ENSR Staff Geologists and Engineers will be assisting with this project as needed. Ms. Elizabeth Martinez will be responsible for QA/QC of documents.

Boart-Longyear has been selected as the drilling contractor to advance the soil borings, using either sonic or hollow-stem auger equipment and to install additional groundwater monitor wells. Boart is licensed by the State of Nevada to install water wells (License No. 0010157).

The primary analytical laboratories that will be used for the analytical program (excluding radionuclides) will be the Columbia Analytical Services (CAS) Laboratories in Rochester, NY; Kelso, WA; and Houston, TX (Nevada certification numbers NY000322008A, WA35, and TX014112007A, respectively). The radionuclides analysis

will be performed by GEL Laboratories, LLC of Charlestown, South Carolina (Nevada certification number SC12). Analysis of soil samples for asbestos will be performed by EMSL Analytical, Inc. of Westmont, New Jersey – the same laboratory that performed the asbestos analysis for the Phase A Source Area Investigation. Laboratory data for the analytical suites will be provided to Tronox in hard copy format as well as Tronox-specific EQuIS™ electronic data deliverable (EDD) format. The laboratory will provide sample receipt notification upon receipt of samples at the laboratory.

2.0 Source Area Investigation for Area I

This section provides a brief summary of the site conditions within Area I and the approach used to develop the soil and groundwater sampling and analytical plans (SAPs) for Area I. The potential source areas that will be evaluated, including associated soil borings and wells for the Area I investigation are shown on **Plate A.**

The list of SRCs for which samples will be investigated in the Phase B Source Area Investigation is presented in **Table 1**. The soil SAP is presented in **Table 2**, which lists the soil borings proposed for Area I, the rationale for each soil boring location, the sample depths, and the analytical program for each soil sample. The groundwater SAP is presented in **Table 3**, which lists the monitoring wells proposed for sampling in Area I along with the analytical plan for each groundwater sample.

2.1 Site Conditions

Background information including the Site description, Site location, physical setting, regional and local geology, hydrogeology, etc., are described in detail in the *Conceptual Site Model (CSM) Report* (ENSR 2005) and the *Phase A Source Area Investigation Report* (ENSR 2007b). **Figure 4** shows local groundwater conditions within Area I that were developed from groundwater levels collected in May and December 2007 as well as historic wind direction for the Site. The general hydrogeologic conditions within Area I are summarized as follows:

- Groundwater is encountered in the alluvium and the fine-grained facies within uppermost Muddy Creek Formation. In those areas not influenced by the groundwater barrier and interceptor wells and the recharge trenches, the depth to groundwater measured in May and December 2007 ranges from about 27 to 38 feet below ground surface (bgs).

- The groundwater flow direction in Area I is to the north at a gradient of about 0.01 to 0.014 feet per foot (ft/ft) measured in areas north of the onsite recharge trenches. Portions of the alluvial aquifer are dry in the western part of Area I, as there is a rise in the elevation of the contact with the Muddy Creek Formation in that area **(Figure 4)**. From groundwater level measurements collected in May and December 2007, the alluvial sediments in this area are above the saturated sediments of the Muddy Creek Formation.

- From groundwater level measurements collected in December in the “high” in the western portion of Area I, the groundwater flow direction for the upper portion of the Muddy Creek Formation is to the north at a gradient of about 0.01 ft/ft **(Figure 4)**. The depth to groundwater in this part of Area I was about 27 and 38 feet bgs in December 2007.

- The prevailing wind direction for the period between March 2003 and 2008 is to the northwest and south-southeast at wind speeds up to about 8 to 13 miles per hour (Community Environmental Monitoring Program 2008).

2.2 Development of Area I Sampling and Analytical Plans

The scope of work for each potential source area was designed to address the Phase B Source Area Investigation objectives as described in Section 1.1. Data packages for each LOU were generated (see Appendix A) and provide a review of operational history, historic soil and groundwater sampling results, and

the results of the Phase A Source Area Investigation (ENSR 2007b). From this review, associated analytical classes of SRCs were identified for each potential source area. For each LOU, SAPs for soil and groundwater were developed in consideration of historic chemical use, process wastes generated, operational history of adjacent or overlapping LOUs, surrounding soil and groundwater conditions, chemical distribution, and anticipated environmental fate of SRCs from suspected source areas within the potential source area.

Appendix A contains the data packages for each LOU in Area I. Included in the LOU data packages are associated historic data and recent information from the Phase A Source Area Investigation, and figures showing the LOU and locations of proposed Phase B soil and groundwater samples. Each data package contains a set of soil and groundwater SAPs that are LOU-specific. The LOU-specific SAPs have been consolidated into Area I SAPs for soil and groundwater and are shown as **Table 2** (Area I SAP - Soils) and **Table 3** (Area I SAP - Groundwater). LOU-specific sample locations as shown in the data packages have been consolidated and are shown on **Plate A.** For LOUs that include conveyances (e.g., pipelines) that cross Area I boundaries into Areas II, III, or IV for example, the Area I SAPs list only those sample locations that are in Area I. (Sample locations to evaluate conveyances that cross into Areas II, III, or IV will be listed in the respective SAPs for each Area.)

The data packages incorporate NDEP comments from their review of draft LOU data package submittals. Historic information in the data packages is derived from a number of sources including:

- *Environmental Conditions Assessment Report* (Kleinfelder 1993);
- *Response to Letter of Understanding, Henderson, Nevada Facility (*Kerr-McGee 1996);
- *Phase II Environmental Conditions Assessment, Kerr-McGee Chemical LLC, Henderson, Nevada* (ENSR 1997);
- *Conceptual Site Model (CSM), Kerr-McGee Facility, Henderson, Nevada* (ENSR 2005);
- *Aerial Reconnaissance of Hazardous Waste Sources BMI Industrial Complex, Henderson, 1943-1979* (USEPA 1980);*and,*
- *Phase A Source Area Investigation Results, Tronox LLC Facility, Henderson, Nevada (ENSR 2007b).*

Descriptions of each LOU including details of the process waste streams associated with each LOU were based on information from the Environmental Conditions Assessment (Kleinfelder 1993), the Response to Letter of Understanding (Kerr-McGee 1996), the Phase A Source Area Investigation Results (ENSR 2007b), and interviews with Tronox. The LOU data packages in Appendix A along with the LOU data packages that will be provided in the Work Plans for Areas II, III, and IV contain more detailed information than the CSM report (ENSR 2005). As such, the LOU data packages and Phase B investigation results will be used to revise the CSM including associated CSM figures and three-dimensional cartoons and measles chart. The CSM will be updated after completion of the Phase B soil, soil gas, and groundwater investigation.

2.2.1 Evaluation of LOUs

An LOU summary was prepared for each of the 70 recognized potential source areas on the Tronox property. This facilitated incorporating data on potential impacts of adjacent LOUs into the 13 LOUs in Area I. For each of the 13 LOUs the following were described:

- Closure goals;
- Site investigation area details, including size, location, and current status and features;

- LOU information such as construction details, historical and/or current operations, years of operation, materials used, and process waste streams generated and received;
- adjacent or overlapping LOUs;
- LOUs with potential to affect the specific LOU;
- known or potential chemical classes associated with the LOU;
- known or potential release mechanisms;
- results of historical sampling; and,
- historical data, including Phase A data.

Each LOU summary includes a discussion of the proposed investigation/rationale and constituents for soil, groundwater, and soil gas. A more detailed discussion of the data reviewed as part of the LOU evaluations is provided below.

As part of the evaluation of an LOU, the goal of closure was developed with the input from Tronox and is based on the current and proposed future use of the area. A summary of the closure goal for LOUs in Area I is presented in **Table 4.**

The Site investigation area for each LOU is described, including the dimensions/area, location within the Tronox property, and current status and features of the LOU. These descriptions were developed through review of historical documents, available aerial photographs, recent Site visits, and interviews with Tronox employees. The description provides information about the construction details, historical and/or current operations, years of operation, materials used, and process waste streams generated. To further evaluate potential SRCs at an LOU, process waste streams received from other LOUs or areas of the Site were included in the summary and considered when designing the Phase B scope of work for a particular LOU. SRCs associated with the known process waste streams are provided in a table in the LOU summary.

Associated SRCs for adjacent and/or overlapping LOUs were considered when evaluating an LOU. If an adjacent or overlapping LOU(s) was considered to have the potential to affect the primary LOU, the lists of known or potential chemical classes were compared and analytes were added, if necessary, to the primary LOU's scope of work based on the affecting LOU. A brief description of the affecting LOU and the additional analytes added is included in the LOU summary.

In order to evaluate suitable locations and sampling depths for the Phase B soil borings, known or potential release mechanisms were evaluated. Potential release mechanisms (i.e., infiltration, surface runoff, etc.) associated with an LOU is based on surface features, LOU construction, and historical operations. Known releases noted in historical documents are described and considered. In addition, analytical results and historical soil and groundwater sampling locations from previous investigations were evaluated for their adequacy to address potential or known releases.

Data from the Phase A Source Area Investigation (ENSR 2007b) were also evaluated. For an LOU with a Phase A sampling location within its boundaries, Phase A data were used as indicators of possible previously unknown SRCs at that LOU. SRCs detected in Phase A borings, and not already associated with an LOU, were added to the "Known or Potential Chemical Classes" list. For LOUs with no Phase A locations within their boundaries, the closest Phase A location is provided. The Phase A data in these cases is provided in the LOU summary only as an indication of subsurface soil and groundwater conditions in the vicinity of the LOU. Analytical data from the Phase A investigation were reviewed and constituent classes detected in soil were

compared to the list of "Known or Potential Chemical Classes" identified for the specific LOU. Phase A constituent classes not consistent with the "Known or Potential Chemical Classes" list were added to the Phase B analytical program. Based on the location of the Phase A sample locations, a determination was made as to whether or not they were located in "worst case" areas of the LOU. If not, Phase B investigations were proposed.

A soil boring assessment has been proposed as part of the Phase B Source Area Investigation to evaluate the known and potential source areas onsite. In general, soil borings designed to assess an LOU will be drilled within the LOU boundaries. In cases where drilling within an LOU is not possible (e.g., an LOU is active or the integrity of containment could be compromised) soil borings will be located adjacent to the LOU. Soil borings upgradient and downgradient of an LOU will also be sampled to further assess the LOU and the impact, if any, on surrounding areas.

The Phase B soil borings consist of two categories, Judgmental and Random. Judgmental boring locations are designed to evaluate known or potential chemical classes associated with a specific LOU based on the known process waste streams. These soil borings are located in or near an LOU at locations considered to be either "worst case", representative of soil conditions at the LOU, or in areas of reported or known releases. The Phase B analytical program for the Judgmental borings is based on known or potential chemical classes specifically associated with an LOU.

To further evaluate the possibility of additional potential source areas beyond the 70 already identified onsite, an additional random soil boring assessment will be implemented area-wide as part of the Phase B Source Area Investigation. With the concurrence of NDEP, the Site has been divided into 4-acre grids as shown on **Plate A**. Each grid has been further subdivided into 25 subsections, one of which was randomly selected to be sampled for the Area I investigation (**Plate A**). Soil samples from the randomly located borings will be collected at an initial interval of 0.5 feet bgs and each 10 feet thereafter, extending to the water table. In areas where surface features were noted, such as minor stains or above ground pipelines, judgmental soil samples will only be collected at 0.5 feet and 10 feet bgs.

Within Area I of the Site, the combined random and judgmental soil boring evaluation program will include the drilling of 63 soil borings. Each random sample location is designated with an identifier such as RSAQ8. The prefix symbol "R" identifies the sample as random; "SA" indicates it is a source area investigation boring, and Q8 denotes the grid identifier.

To be conservative, a modified Phase A Source Area Investigation soil sampling suite is proposed (see Section 2.3.2)

Groundwater conditions upgradient and downgradient of the LOU, and/or at the LOU will be evaluated by sampling existing or new groundwater monitoring wells. Groundwater beneath the Site is considered to be a Site-wide issue therefore, the full Phase A Source Area Investigation groundwater sampling analytical suite will be implemented for each proposed well (see Section 2.3.3).

2.2.2 Evaluation of Other Potential Sources

The Phase B scope of work includes sampling locations for potential source areas not identified as LOUs. A review of Phase A data suggests that offsite sources of constituents may exist. Soil borings designed to evaluate areas not associated with a specific LOU are listed in **Table 5**. These proposed borings are random

borings as described in Section 2.2.1 and will be analyzed for the modified Phase A analytical suite (see Section 2.3.2).

2.3 Summary of Area I Investigation

The proposed soil and groundwater sampling locations shown on **Plate A** were selected to determine the nature and extent of SRCs within Area I. Soil samples will be collected at 63 locations within Area I. Groundwater samples will be collected from 32 wells within Area I. Because the movement of groundwater transcends man-made features such as LOU boundaries, groundwater samples will also be collected from an additional 27 wells that are located north (downgradient) or east/west (cross-gradient) of Area I. In total, groundwater samples will be collected from 59 wells of which about 10 percent were sampled during the Phase A investigation **(Plate A)**.

The following is a summary of the soil and groundwater sampling program for the Phase B Source Area Investigation for Area I. Procedures and protocols for collecting soil and groundwater samples are presented in Section 3.0.

2.3.1 Surface Soil Sampling for Asbestos

Asbestos fibers were identified in surface soil samples from the Phase A Source Area Investigation (ENSR 2007b). As a result, surface soil samples will be collected and analyzed for asbestos as part of the Phase B Source Area Investigation.

Soil samples from 63 locations will be collected in Area I for asbestos analysis by the modified elutriator method of Berman and Kolk based on United States Environmental Protection Agency (USEPA) 640/R-97/028. Each sample location corresponds with a Phase B soil boring location; asbestos samples will be collected at each soil boring location proposed for the Area I investigation **(Plate A)**. **Table 2** lists the locations where surface soil samples for asbestos analysis will be collected. Sampling procedures are described in Section 3.1 of this Work Plan.

The number of samples to be collected, when combined with the Phase A Source Area Investigation results for Area I preparation is designed to provide a sufficient statistical sample population and geographic distribution in for of the Site-wide HHRA. The 63 soil sample locations in Area I include 13 locations that were suggested by the NDEP in comments to the Phase A Source Area Investigation Results Report (ENSR 2007b).

2.3.2 Subsurface Soil Sampling

Soil samples will be collected at 63 locations within Area I and analyzed for constituent classes that were identified as follows:

- constituents that were identified in an LOU based on historical site investigations;
- constituents that were identified as historically being used or stored at an LOU; and
- constituents that were or are potentially associated with process waste streams at an LOU;
- constituents that were associated with overlapping or adjacent LOUs.

In addition, soil samples from randomly selected sample locations will be analyzed for the modified Phase A list of SRCs (see below).

The analytes listed on **Table 1** are the same analytes that the Phase A samples were analyzed for with the following modifications:

- Analysis of soil for polychlorinated biphenyl (PCB) compounds will not be performed on Phase B soil samples except at locations where it is documented that PCBs were used or stored (e.g., LOU 40 – former PCB Spill Area in Unit 5 and LOU 27 – former PCB Storage Area in Unit 2) or reported in Phase A samples (e.g., boring SA09 in LOU 35 – former Truck Emptying/Dumping Area). The basis for this decision is that PCBs were only detected in one out of 130 soil samples (0.47J mg/kg at Phase A boring SA09 at 20 feet) in the Phase A Source Area Investigation (ENSR 2007b).

- Analysis of soil for organophosphorus pesticides (OPPs) will not be performed on Phase B soil samples. The basis for this decision is that there is no documentation to indicate OPPs were used, manufactured, or stored on the Tronox Site. Moreover, OPPs (Demeton-O) were detected in only one out of 36 Phase A soil samples (i.e., Phase A boring SA17 at 0.092J mg/kg). SA17 is located in Beta Ditch, which also received waste effluent from offsite sources west of the Tronox Site.

- Analysis of soil for organochlorine herbicides (OCHs) will not be performed on Phase B soil samples. The basis for this decision is that there is no documentation to indicate OCHs were used, manufactured, or stored on the Tronox site. Moreover, OCHs were not detected in any of the Phase A soil samples analyzed.

- Analyses of soil for radionuclides will consist of alpha spectroscopy for isotopic uranium, thorium, and radium-226; and radium-228 analysis will be performed using beta-counting. Unlike the Phase A investigation, Phase B soil samples will not be screened using gamma spectroscopy.

- Formaldehyde was added to the Phase B analyte list as formaldehyde may have been associated with LOUs 38 and 54.

In general, soil samples for the Phase B Source Area Investigation will be collected initially at a depth of 0.5 foot bgs and thereafter at 10-foot depth intervals to the level of the water table. The soil sampling program proposed for Area I, including a complete list of soil borings, the proposed sample depths, and the analytical program for each sample is shown in **Table 2**.

2.3.3 Groundwater Sampling

The Phase A Source Area Investigation Results Report (ENSR 2007b) identified SRCs in groundwater that were present at concentrations above comparison levels. The Phase A Source Area Investigation Results Report, the ECA report (Kleinfelder 1993), and the CSM report (ENSR 2005) form the basis for further evaluation of SRCs in shallow groundwater as part of the Phase B Source Area Investigation.

As shown on **Figure 5,**, groundwater samples will be collected from wells in Area I and in areas north of Area I as part of the Site-wide evaluation of SRCs in groundwater. **Table 3** lists all of the wells that will be sampled for laboratory analyses as part of the Area I investigation of groundwater.

Groundwater samples will be analyzed for the list of SRCs shown on **Table 1**. Unlike the Phase A analytical program for groundwater samples with one exception, the Phase B groundwater samples will not be analyzed for PCBs because PCBs were not detected in the Phase A samples that were collected from 27 wells spread across the Site. (The exception is that groundwater from well M-123 will be analyzed for PCBs because

Phase A soil sample SA09-20 exhibited a detectable concentration of PCBs. Both SA09 and M-123 are located in LOU 35.) Similarly, groundwater samples will not be analyzed for OPPs because OPPs were not detected in the Phase A samples that were collected from 27 wells spread across the Site.

2.3.3.1 Groundwater Sampling in Area I

Groundwater samples will be collected from 32 wells across Area I as shown on **Figure 5**. The sample locations were selected to:

- evaluate specific LOU areas as identified in the CSM report (ENSR 2005) as potential source areas, and
- further evaluate the horizontal extent of SRCs that was identified in the Phase A Source Area Investigation Results report (ENSR 2007b).

2.3.3.2 Groundwater Sampling North of Area I

The Phase A Source Area Investigation Results Report (ENSR 2007b) identified SRCs in groundwater in wells along the northern boundary of the Tronox Site. As a result, groundwater samples will be collected from 22 wells located in Parcels A through E, I, and J as part of the Phase B Source Area Investigation. Moreover, groundwater samples will be collected from two (2) wells (H-38 and AA-BW-02A) located west of Area I, and three (3) wells (CLD-1R, CLD-2R, and CLD-3R) that are located east of Area I.

Table 3 lists all of the groundwater wells that will be sampled east, north, and west of Area I. Groundwater samples from these wells will be analyzed for the modified Phase A Source Area Investigation suite of analytes. These SRCs are listed on **Table 1**.

2.3.4 Additional Data Collection

Additional tests will be performed on soil samples collected in Area I to gather data in support of further site characterization activities or risk assessment modeling. This includes performing tests on soil samples to: 1) evaluate the soil-to-groundwater migration potential of SRCs, and 2) gather data on the physical properties of on-site soils to provide site-specific parameters.

2.3.4.1 Soil-to-Groundwater Migration Potential of SRCs

The *Phase A Source Area Investigation Results* report (ENSR 2007b) identified SRCs in soil that have the potential to migrate to groundwater at concentrations of potential concern. Soil samples from the borings listed below will be collected for analysis of leachability in Area I.

Primary Soil Boring Number	Grid Location
RSAJ3	J-3
RSAK7	K-7
RSAM3	M-3
SA76	K-6
SA160	O-2
SA182	O-4

The potential for an SRC to partition from soil to groundwater will be determined using the Synthetic Precipitation Leaching Procedure (SPLP), USEPA Method 1312. The partitioning factor approach uses a leaching agent to evaluate the concentration of the chemical of interest (i.e., target SRC) that might leach from the solid matrix and partition into the pore water thus having the potential to affect water quality. Evaluating the potential for partitioning involves a three step process as follows:

- Soil samples are initially analyzed for the target SRCs to determine their solid matrix concentration **(Table 2)**;
- Samples are then subjected to the leaching procedure using water with a pH of about 5.0 to derive the leachate or extract it; and
- Lastly, the leachate is analyzed for the target SRCs to evaluate a chemical's potential to partition into the pore water.

The SPLP employs as the leaching agent a liquid with a pH of about 5.0 to reflect slightly acidic precipitation in areas west of the Mississippi (USEPA 1994). The analytical suite will include the SRC chemical categories shown on **Table 2**. SRCs were selected for analysis along the soil-to-groundwater pathway because they were reported above detection limits in Phase A samples, were detected in soil samples in other previous site investigations, and the CSM indicated concentrations that were greater than their respective comparison level.

2.3.4.2 Geotechnical Testing Program

A total of six soil samples will be collected and sent to a geotechnical engineering laboratory in order to measure physical parameters of the soil encountered during the course of this investigation. The soil samples will be collected from borings RSAO2, RSAJ2, and RSAJ5. Soil samples will be collected at variable depths to provide an assessment of physical parameters from the alluvial soils encountered in these borings. Data from the geotechnical tests will provide site-specific data that will be used to support risk assessment studies, modeling of the vadose zone for potential contaminant migration pathways, and to support evaluation of remedial alternatives, if necessary.

Fine-grained and coarse-grained soil samples will be collected and analyzed for the following parameters:

- Moisture content (dry weight basis) using American Society for Testing and Materials (ASTM) Method D-2216;
- Particle size analysis using ASTM Method D-422 (for sand and gravel) and C117-04 (for silt and clay);
- Soil Dry Bulk Density using ASTM Method D2937;
- Grain Density using ASTM Method D854;
- Soil Water-Filled Porosity using ASTM Method D2216;
- Vertical Hydraulic Conductivity using ASTM D5084/USEPA 9100.

3.0 Description of Field Sampling and Analytical Program

Field sampling activities will consist of collecting soil and groundwater samples for laboratory analyses. In places, surface soil samples will be collected for asbestos analysis. This section describes the methods and procedures that will be used to collect the asbestos, soil, and groundwater samples for the Area I investigation.

Pre-field activities will include underground utility clearance by a geophysical surveyor and notification of Underground Services Alert using the same procedures described in the *Phase A Source Area Investigation Work Plan* (ENSR 2006c). Data acquisition requirements and QA/QC procedures are provided in the ENSR QAPP (ENSR 2006d), which is in the process of being amended and will be provided to the NDEP prior to the work being performed. The field procedures will follow applicable *BRC Standard Operating Procedures (SOPs)* (BRC 2007) that are listed below:

- SOP-00 – QA/QC for Submissions to the NDEP
- SOP-02 – Groundwater Monitoring Well Design and Installation
- SOP-03 – Groundwater Monitoring Well Development
- SOP-05 – Water Sampling and Field Measurements
- SOP-06 – Sample Management and Shipping
- SOP-07 – Soil Sampling
- SOP-10 – Surveying
- SOP-12 - Surface Soil Sampling for Asbestos
- SOP-13 – Operating and Calibration Procedures for Field Equipment
- SOP-14 – Field Documentation
- SOP-15 – Field Logbook
- SOP-17 – Soil Logging
- SOP-19 – Borehole Abandonment
- SOP-20 – Filter Pack and Well Screen Slot-Size Determination
- SOP-23 – Split Spoon Sampling
- SOP-31 – Drilling Equipment Decontamination
- SOP-34 – Investigative-Derived Waste (IDW) Management
- SOP-39 – Photoionization Detector (PID) Screening Procedure

3.1 Soil Sampling for Asbestos

At locations where soil samples for asbestos analysis are proposed, surface soil samples will be collected according to *SOP-12 - Surface Soil Sampling for Asbestos* and sent to EMSL Analytical, Inc. for asbestos testing. Soil samples will be analyzed for asbestos using the modified elutriator method (USEPA Method 540 R-97/028 as modified by Berman and Kolk) on which BRC *SOP-12* is based. Two soil samples will be collected from each location. The first soil sample will be analyzed for asbestos, and the second sample will be analyzed for moisture and silt content determination, which is required for this analytical procedure. The

protocol structure definition for long asbestos fibers will be >10 micrometers (um) in length and <0.4 um in width per EPA guidance (USEPA 2003).

3.2 Subsurface Soil Sampling

Soil samples will be collected using the methods described in the *BRC Field Sampling and Standard Operating Procedures Manual* (BRC, 2007).

Soil samples will be collected using a variety of methods consisting of one or more of the following: sonic, hollow-stem auger, or Geoprobe™ drilling. During drilling activities, soil samples will be screened for organic vapors using a photo-ionization detector (11.8 electron volt [eV] lamp) and a flame-ionization detector (FID) using the procedures described in *SOP-39 – PID Screening Procedure*. Soil borings will be logged in the field using the procedures as described in *SOP-14 – Field* Documentation and *SOP-17 – Soil Logging*. Soil samples will be collected following the procedures described in BRC *SOP-7 – Soil Sampling*.

If a sonic drill rig or hollow-stem auger drill rig is employed, a split-spoon sampler fitted with brass liners will be used to collect soil samples for laboratory analyses using the procedures described in BRC *SOP-23 – Split Spoon Sampling* (BRC 2006). If a Geoprobe™ drill rig is used, soil samples will be collected using a Macro-corer™ sampler fitted with acetate liners. Equipment cleaning or decontamination procedures will be followed using the procedures described in *SOP-31 – Drilling Equipment Decontamination*.

Soil samples designated for volatile organic compound (VOC) analyses will be taken from the brass sleeve (or acetate liner) and placed into containers prescribed under USEPA Method 5035. These containers will consist of laboratory-supplied 40-milliliter (ml) volatile organic analysis vials filled with pre-measured amounts of preservatives. The samples will be collected using the procedures described in the *Phase A Source Area Investigation Work Plan* (ENSR 2006c). Sample containers will be sealed, labeled, and placed on ice inside an ice chest and shipped to the laboratory under chain-of-custody protocol using the procedures described in *SOP-6 – Sample Management and Shipping* (BRC 2006).

Each borehole will be abandoned once the target depth has been reached and the necessary samples are obtained. The boreholes will be abandoned by backfilling with a bentonite/neat cement grout using the procedures described in *SOP-19 – Borehole Abandonment*.

Soil cuttings (including unused soil cores) will be temporarily stored in U.S. Department of Transportation (DOT)-approved steel 55-gallon drums while awaiting receipt of the final laboratory results. Each drum will be managed according to the procedures described in *SOP-34 – Investigative Derived Waste (IDW) Management*. At the end of each day, well development groundwater and equipment decontamination water will be temporarily stored in DOT-approved 55-gallon drums. Each drum will be marked with water-proof labels and water-proof markers. Each drum will receive a unique identification number and will be catalogued for waste containment documentation purpose. Following characterization, each drum of material will be disposed of as appropriate per federal, state and local requirements.

3.3 Groundwater Investigation

Groundwater investigation will involve the installation of six monitoring wells and the collection of 59 groundwater samples from new and existing wells in Area I and wells north (downgradient), and west and east of Area I **(Figure 5)**. New groundwater monitoring wells will be placed in Area I to further delineate SRCs

detected in the groundwater grab samples collected during the Phase A Source Area Investigation (ENSR 2007b). In addition to the wells installed to further investigate SRCs identified in the Phase A Source Area Investigation, a replacement well will be installed for well M-111, which was inadvertently damaged during Tronox decommissioning activities prior to the start of the Phase A field activities in 2006. The new well will be designated M-111A and the original well (M-111) will be abandoned in accordance with Nevada Administrative Code using the procedures described in *SOP -21 – Monitoring Well Destruction*.

3.3.1 Monitoring Well Installation and Well Development

The groundwater monitoring wells will be installed according to the procedures described in S*OP-2 – Groundwater Monitoring Well Design and Installation*. Depending on the hydrostratigraphy encountered, the wells will be screened within the saturated alluvial materials or the upper unconfined portion of the Muddy Creek Formation. Well screens completed in the alluvium may extend a few feet into the upper Muddy Creek Formation. If groundwater is not encountered in the alluvium, the well will be installed in the upper portion of the Muddy Creek Formation. Recent groundwater level measurements from adjacent wells will be considered in selection of the screen interval.

Each monitoring well will be developed to remove sediments from the well and to improve the hydraulic communication between the well and the surrounding aquifer formation. Well development will be performed according to the procedures described in *SOP-3 – Groundwater Monitoring Well Development*.

To protect the well head, a steel protective casing will be cemented in-place around the well. The well casing and steel protective casing will extend at least one foot above the ground surface. A cement pad will be placed on the ground surface around the steel protective casing. If the well is completed flush with the ground surface, a flush-mount well box with a traffic-rated steel lid will be cemented around the well casing. Flush mounted well boxes will be used in traffic areas.

At the end of each day, well development groundwater as well as equipment decontamination water will be temporarily stored in DOT-approved 55-gallon drums. Each drum will be marked with water-proof labels and water-proof markers. Each drum will receive a unique identification number and will be catalogued for waste containment documentation purpose. Following characterization, each drum of material will be disposed of as appropriate per federal, state and local requirements.

3.3.2 Groundwater Sampling

Groundwater samples will be collected using the procedures described in *SOP-5 – Water Sampling and Field Measurements.* After water levels are measured, each well will be purged using low flow micropurge methods. Once the parameters (e.g., pH, temperature, conductivity, dissolved oxygen, oxidation-reduction potential, etc.) have stabilized, water samples will be collected. Groundwater parameter field measurements will be recorded on a field data sheet for each well. Consistent with *SOP-5– Water Sampling and Field Measurements*, groundwater samples designated for metals and radionuclide analyses will be filtered in the field if turbidity levels of 10 nephelometric turbidity units (NTUs) or lower are not achieved.

Groundwater sampling equipment will be cleaned after sampling each well in accordance with *SOP-5*. At the end of each day, purge water as well as equipment decontamination water will be temporarily stored in DOT-approved 55-gallon drums. Each drum will be marked with water-proof labels and water-proof markers. Each drum will receive a unique identification number and will be catalogued for waste containment documentation

purpose. Following characterization, each drum of material will be disposed of as appropriate per federal, state and local requirements.

3.4 Site Surveying

Sample locations including soil borings and new monitoring wells will be surveyed as described in *SOP-10 – Surveying*. In general, locations will be surveyed to an accuracy of 0.01-foot vertical and 0.1-foot horizontal relative to Nevada Coordinate System Datum (North American Vertical Datum 1983 and North American Datum 1983, Nevada East Plane) by a Nevada-licensed land surveyor.

3.5 Analytical Testing Program

The Phase B samples (soil and groundwater) will be analyzed using the USEPA Methods shown on **Table 1. and 3**. Sample containers, analytical methods, and holding times for the various analytes are presented in the QAPP (ENSR 2006d, revised 2008) and are shown on **Tables 6 and 7**. **Table 1** lists the Laboratory Reporting Limits (RL) for each Phase B SRC in soil and groundwater.

3.6 Field Quality Assurance/Quality Control Requirements

An integral part of the Phase B Area I Work Plan is the QA/QC program to ensure the reliability and compatibility of all data generated during this assessment. The following subsections describe the QA/QC program that will be implemented as part of the Phase B activities at the Site. These requirements are described in detail in the QAPP (ENSR 2006d, revised 2008).

3.6.1 Field QA/QC Samples

Field QA/QC procedures will be followed to ensure viability and integrity of sample analytical data. The field investigative team will be responsible for submitting QA/QC samples to the laboratory. QA/QC samples include field duplicates, trip blanks, equipment decontamination blanks, and field blanks.

3.6.1.1 Field Duplicate Samples

One field duplicate will be collected for every 10 samples submitted for analysis. The duplicate sample will be tested for the same suite of analytical parameters as the corresponding original sample. For duplicate groundwater samples, two sets of sample containers will be filled and both will be submitted for analysis.

3.6.1.2 Trip Blank Samples

Trip blanks will be provided by the laboratory. One pair of volatile organic analyses trip blanks will be included in each cooler that contains samples for VOC analyses. One trip blank per day will be analyzed for the same VOCs scheduled for analysis. The trip blanks for water samples will consist of laboratory reagent water shipped to and from the sample Site in the same type of sample containers and with the same preservative as the collected samples. Trip blanks will not be opened or exposed to the atmosphere in the field.

3.6.1.3 Equipment Decontamination Blank Samples

Equipment decontamination blanks will consist of distilled water rinsed through clean sampling devices. These devices include the soil sampling equipment and groundwater sampling equipment used in the investigation.

A minimum of one equipment blank per day of sampling per sampling team will be collected and analyzed for the same suite of analytes that the soil or groundwater samples are analyzed for (on a daily basis), including all SRC chemical categories, except organochlorine pesticides, and dioxins/furans,. If a non-dedicated groundwater pump is used, a pump decontamination blank (i.e., pump blank sample) will be obtained for each pump used before and after use for the groundwater sampling event.

3.6.1.4 Field Blank Samples

Field blank samples consisting of the decontamination source water will be analyzed for the full suite of analytes shown on **Table 1**, except for asbestos. Field blank samples will be collected from water used for the equipment blank samples.

3.7 Laboratory QA/QC Procedures

Laboratory quality control (QC) measures will be taken to confirm the integrity of the laboratory data generated during the source area investigation program. The procedures used to assess laboratory data quality are described in the QAPP (ENSR 2006d) and are summarized below:

- Method blanks will be analyzed daily to assess the effect of the laboratory environment on the analytical results. Method blanks will be performed for each parameter analyzed.

- Each sample to be analyzed for organic parameters will contain surrogate spike compounds. The surrogate recoveries will be used to determine if the analytical instruments are operating within acceptable limits. Surrogate recoveries will be compared to control limits established and updated by the laboratory based on its historical operation.

- Matrix spike and matrix spike duplicate (MS/MSD) samples will be analyzed at a frequency of approximately one sample for every 20 project samples submitted. MS/MSD results will be evaluated to determine whether the sample matrix is interfering with the laboratory analysis and provide a measure of the accuracy and precision for the associated analytical data. MS/MSD recoveries and precision will be compared to control limits established and updated by the laboratory based on its historical operation.

A full Contract Laboratory Program (CLP) laboratory QC data package will be included with the analytical results. This QC data will include method blanks, surrogate spike recoveries (for organic parameters only), matrix spike recoveries, sample duplicate or matrix spike duplicates results, initial and continuing calibration data, gas chromatography/mass spectrometry tuning data, instrument raw data including chromatograms and mass spectra, inductively coupled plasma serial dilutions and interference check sample results, standards and sample preparation worksheets, and a case narrative describing QA/QC non-conformances and corrective action. Radiochemical analyses reports will include calibration control charts and background results for detectors associated with all radiochemical results. All results will be reported including estimated values between the detection and reporting limits.

Consistent with the QAPP, prior to submitting analytical results to Tronox/ENSR, the supervising chemist will check the entire data package so that the data are acceptable. These checks include:

- Project requirements for precision, accuracy, and detection limits;
- Analytical procedure blanks, duplicates, matrix spike recoveries, and other method required QC results; and,
- Instrument standardization and response factors.

3.7.1 Data Quality Indicators

Specific quality assurance objectives for measurement are defined by precision, accuracy, representativeness, comparability, and completeness. Specific requirements for quality assurance will be based on standard laboratory methods, QAPP requirements, and data validation guidelines. Definitions of precision, accuracy, comparability, and completeness as they pertain to analytical data are briefly described below and more thoroughly described in the project QAPP (ENSR 2006d). If data do not meet data quality objectives, action will be taken to address the issues and resolve them as appropriate.

Precision will be evaluated using duplicate samples and expressed as relative percent difference (RPD) or percent relative standard deviation (%RSD). These quantities are defined as follows:

$$\%RPD = (A1 – A2)/(A1 + A2)/2 \text{ X}100$$

Where: A1 and A2 are the reported concentrations for each duplicate sample.

The objectives for field duplicate precision RPDs are 30% RPD for aqueous samples and 50% RPD for solid samples. The objectives for laboratory duplicate precision will be based on requirements within the appropriate USEPA methods or laboratory SOPs.

Accuracy will be evaluated using percent recovery data from spiked samples and laboratory control samples. Percent recovery is defined as:

$$\% \text{ Recovery} = (R/S) \text{ X } 100$$

Where:

S = spiked concentration
R = reported concentration.

Percent recovery acceptance criteria used to evaluate the results will be analyte- and laboratory-specific and based on laboratory statistical control limits.

Representativeness is the degree to which sample data accurately and precisely represent a characteristic of a population parameter, variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter that is mostly concerned with the proper design of the sampling program (i.e., that the number and locations of samples are sufficient for the purposes of the investigation). Measures can be taken to achieve a high degree of representativeness. Such measures will include but are not necessarily limited to the following:

- Obtaining samples over a range of environmental conditions. In the case of groundwater sampling, this would include: (a) the systematic collection of samples over time to account for temporal variations, and (b) an adequate number of, and appropriately located, sampling locations to account for spatial variations.

- Use of previously collected site-specific data to guide the selection of appropriate sampling locations and chemical parameters.

- Use of appropriate sample collection procedures.

Comparability is a qualitative expression of the measure of confidence that two or more data sets may contribute to a common analysis. Comparability of data within the investigation will be controlled by using standard EPA methods for sampling and analysis, reporting data, and data validation.

Completeness is the percentage of measurements made that are judged to be valid measurements. Completeness can be quantitatively assessed simply by calculating the percentage of valid data obtained. Field completeness is a measure of the amount of valid samples obtained during all sampling for the project. The field completeness objective is greater than 90 percent. Laboratory completeness is a measure of the amount of valid measurements obtained from all the measurements taken in the project. The laboratory completeness objective is greater than 95 percent.

4.0 Data Evaluation and Reporting

4.1 Data Review

Data will be evaluated to verify that soil, groundwater, and QA/QC samples were collected in compliance with the specifications contained in the Work Plan and the QAPP (ENSR 2006d). The laboratory-certified analytical reports will be reviewed to determine if samples were analyzed within holding times and that laboratory QA/QC samples, such as MS/MSD were within the laboratory-specific acceptable ranges. Deviations, if any, will be identified. One hundred percent of the laboratory data will be reviewed and 10 percent of the laboratory packages will undergo comprehensive data validation as described by NDEP guidance (NDEP 2006). For this reason, the laboratories have been requested to provide CLP-like data packages. If some of the validation packages indicate problems, a larger percentage may be validated. As appropriate, the following statistical tests may be applied to the data: T-test, Gehan Modification of the Wilcox Rank Sum, Analysis of Variance (ANOVA), Krusall-Wallis, Quantile Test, Slipage Test, and box and whisker plots.

4.2 Data Validation Reports

Data validation reports will include a description of the field methods employed, analytical methods, analytical results, data evaluation methods, and data validation results. Typed boring logs and well completion diagrams will be included in the report. The results of laboratory analysis will be presented in tabulated form. The laboratory-certified analytical reports will be provided in Adobe Acrobat (.PDF) electronic form on a compact disc (CD) in an appendix. An Access accessible data file of this data will be provided.

4.3 Assessment of Adequate Characterization for SRC Parameters

Consistent with the *EPA Risk Assessment Guidance for Superfund, Volume 1* (EPA 1989) and *EPA Guidance for Data Useability in Risk Assessment (Part A)* (EPA 1992), each of the SRC parameters investigated during Phase B will be evaluated to assess the adequacy of its characterization. A particular SRC parameter may be determined to be adequately characterized by applying a combination of the following evaluation steps:

- Determine if parameter detection-limits are below the project-specific comparison levels;
- Determine whether the data indicate that the parameter is either absent or is rare in frequency;
- Compare the parameter detections with the up-gradient and Phase A data, and assess whether the results are consistent with background conditions;
- Determine whether the probability of a parameter occurring at a specific location or depth is remote due to the lack of evidence of historical uses and/or occurrence; and
- Apply appropriate statistical tools to verify the comparability of the parameter with other data populations.

These review steps, and others as needed, will be applied to the SRC data to assess whether characterization is adequate. Once a SRC parameter is established to be adequately characterized it will be recommended for exclusion from future characterization activities.

4.4 Assessment of Inadequate Characterization for SRC Parameters

Consistent with the *EPA Risk Assessment Guidance for Superfund, Volume 1* (EPA 1989) and *EPA Guidance for Data Useability in Risk Assessment (Part A)* (EPA 1992), a particular SRC parameter may be determined to be inadequately characterized when applying a combination of the following evaluation steps:

- Determine if the parameter detection-limits are below the project specific comparison levels;
- Determine whether the data indicate that the parameter is either absent or is rare in frequency;
- Compare the parameter detections with the up-gradient and Phase A data, and assess whether the results are consistent with background conditions;
- Determine whether the probability of a parameter occurring at a specific location or depth is remote due to the lack of evidence of historical uses and/or occurrence; and
- Apply appropriate statistical tools to verify the comparability of the parameter with other data populations.

5.0 Investigation Report and Schedule

Upon completing field activities and receipt of the analytical results, the Area I investigation data will be compiled.. Elements of the Area I investigation and results will be integrated with the soil and groundwater data from the Area II, III and IV investigation, the soil gas investigation, and background water quality investigation to create a report on the results of the Phase B Source Area Investigation for the Site. One document will be provided to the NDEP, which will summarize all the Area investigation results.

The Phase B report will summarize the Site description, LOUs, previous environmental assessments conducted at the Site, including the Phase A results, site physical conditions and the findings of the soil, soil gas, and groundwater sampling program. The report will be organized similar to the *Phase A Source Area Investigation Report* (ENSR 2007b) and will include the following:

- Copies of applicable permits;
- Field logs, groundwater sampling and boring logs;
- Description of field procedures and any deviations from the proposed program;
- Presentation of field observations and analytical results;
- Certified analytical laboratory reports and chain-of-custody documentation;
- Data validation summary report and data validation memorandum;
- Summary tables of results organized by chemical species (i.e., VOCs, SVOCs, metals) and environmental media (i.e., soil, soil gas, and groundwater);
- Figures showing the results of the soil, soil gas and groundwater sampling program organized in a similar fashion as the tables by chemical species and environmental media;
- Discussion of the data and comparison to screening level criteria; and
- Recommendations for additional assessment, as applicable.

The Area I investigation activities will commence within 30 days following NDEP approval of this Work Plan. Actual start dates will depend on the availability of drilling contractors at the time of approval. General milestones and durations are provided below:

- Field Activities – three to four weeks, inclusive of utility clearance activities at the Site;
- Laboratory Analyses – four to six weeks; and
- Data Validation and Analysis – four to six weeks.

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6.0 References

BRC, 2007, Basic Remediation Company (BRC) Field Sampling and Standard Operating Procedures Manual for the BMI Common Areas, August 2007.

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TABLES

Table1

List of Site-Related Chemicals and Reporting Limits

Phase B Source Area Investigation Work Plan - Area I

Tronox LLC Facility - Henderson, Nevada

Analyte	CAS No.	Method soil / water	Lab RL soil	RL Goal soil	Lab RL water	RL Goal water
Metals			mg/kg		ug/L	
Aluminum	7429-90-5	EPA 6010	1.00E+01	7.50E+01	5.00E+01	5.00E+01
Antimony	7440-36-0	EPA 6020	5.00E-02	3.00E-01	5.00E-02	6.00E+00
Arsenic	7440-38-2	EPA 6020	5.00E-01	1.59E-01	5.00E-01	1.00E+01
Barium	7440-39-3	EPA 6010	2.00E+00	8.20E+01	5.00E+00	2.00E+03
Beryllium	7440-41-7	EPA 6020	2.00E-02	3.00E+00	2.00E-02	4.00E+00
Boron	7440-42-8	EPA 6020	5.00E-01	2.27E+00	5.00E-01	7.30E+02
Cadmium	7440-43-9	EPA 6020	2.00E-02	4.00E-01	2.00E-02	5.00E+00
Calcium	7440-70-2	EPA 6010	1.00E+01	na	5.00E+01	na
Chromium (total)	7440-47-3	EPA 6020	2.00E-01	4.48E+01	2.00E-01	1.09E+01
Chromium (hexavalent)	18540-29-9	EPA 7199/3060A / 218.6	5.00E-01	2.00E+00	1.00E+01	1.00E+02
Cobalt	7440-48-4	EPA 6010	2.00E+00	3.29E+00	1.00E+01	7.30E+01
Copper	7440-50-8	EPA 6010	2.00E+00	4.68E+02	1.00E+01	1.30E+03
Iron	7439-89-6	EPA 6010	4.00E+00	7.53E+00	2.00E+01	3.00E+02
Lead	7439-92-1	EPA 6020	5.00E-02	1.34E+01	2.00E-02	1.50E+01
Magnesium	7439-95-4	EPA 6010	4.00E+00	na	2.00E+01	1.50E+05
Manganese	7439-95-4	EPA 6010	2.00E+00	3.26E+00	5.00E+00	5.00E+01
Mercury	7439-97-6	EPA 7471/7470	2.00E-02	1.64E-01	2.00E-01	2.00E+00
Molybdenum	7439-98-7	EPA 6020	5.00E-02	3.66E-01	5.00E-02	1.82E+01
Nickel	7440-02-0	EPA 6020	2.00E-01	7.00E+00	2.00E-01	7.30E+01
Platinum	7440-06-4	EPA 6020	1.00E-01	na	1.00E-01	na
Potassium	7440-09-7	EPA 6010	2.00E+02	na	2.00E+03	na
Selenium	7782-49-2	EPA 6020	1.00E+00	5.11E+02	1.00E+00	5.00E+01
Silver	7440-22-4	EPA 6020	2.00E-02	2.00E+00	2.00E-02	1.00E+02
Sodium	7440-23-5	EPA 6010	2.00E+01	na	1.00E+02	na
Strontium	7440-24-6	EPA 6010	2.00E+00	7.69E+01	1.00E+01	2.19E+03
Tin	7440-31-5	EPA 6010	1.00E+01	5.48E+02	5.00E+01	2.19E+03
Titanium	7440-32-6	EPA 6010	2.00E+00	1.46E+04	1.00E+01	1.46E+04
Thallium	7440-28-0	EPA 6020	2.00E-02	1.42E-01	2.00E-02	2.00E+00

Table 1 (continued)
List of Site-Related Chemicals and Reporting Limits
Phase B Source Area Investigation Work Plan - Area I
Tronox LLC Facility - Henderson, Nevada

Analyte	CAS No.	Method soil / water	Lab RL soil	RL Goal soil	Lab RL water	RL Goal water
Metals			mg/kg		ug/L	
Uranium	7440-61-1	EPA 6020	2.00E-02	1.53E-02	2.00E-02	3.00E+01
Vanadium	7440-62-2	EPA 6020	2.00E-01	1.02E+02	2.00E-01	3.65E+00
Zinc	7440-66-6	EPA 6010	2.00E+00	6.20E+02	1.00E+01	5.00E+03
Wet Chem Analytes			mg/kg		ug/L	
Alkalinity (total,CO_3^-,HCO_3^-)	na	SM 2320B	2.00E+01	na	2.00E+03	na
Ammonia	7664-41-7	EPA 350.1	5.00E+00	na	5.00E+01	na
Bromide	24959-67-9	EPA 9056	1.00E+00	na	1.00E+02	na
Chlorate	7790-93-4	EPA 9056	2.00E-01	na	2.00E+01	na
Chloride	16887-00-6	EPA 9056	2.00E+00	na	2.00E+02	2.50E+05
Conductivity	na	EPA 9050A	na	na	na	na
Cyanide (total)	57-12-5	EPA 9012A	1.00E+00	1.20E+03	1.00E+01	2.00E+02
Nitrate	7697-37-2	EPA 9056	5.00E-01	na	5.00E+01	1.00E+04
Nitrite	14797-65-0	EPA 9056	5.00E-01	na	5.00E+01	1.00E+03
Perchlorate	14797-73-0	EPA 314.0	1.00E-01	1.00E+01	1.00E+00	1.80E+01
pH	na	EPA 9045C/9040B	na	na	na	na
Phosphate (total)	14265-44-2	EPA 365.1	5.00E-01	na	5.00E+01	na
Sulfate	14808-79-8	EPA 9056	2.00E+00	na	2.00E+02	2.50E+05
Surfactants (MBAS)	na	EPA 425.1	1.00E+00	na	2.00E+01	na
TDS	na	EPA 160.1	na	na	1.00E+04	1.90E+06
Total Organic Carbon	7440-44-0	EPA Lloyd Kahn/ 9060	3.00E+02	na	1.00E+03	na
TSS	na	EPA 160.2	na	na	1.00E+04	na
TPH & Fuel Alcohols			ug/kg		ug/L	
GRO(C6-C10)	na	EPA 8015B	5.00E+01	1.00E+03	na	na
DRO(C10-C28)	na	EPA 8015B	4.00E+04	1.00E+03	na	na
ORO (C28-C40)	na	EPA 8015B	4.00E+04	1.00E+03	na	na
Methanol	67-56-1	EPA 8015B	1.00E+03	3.08E+07	4.00E+02	1.82E+03
Ethanol	64-17-5	EPA 8015B	1.00E+03	na	4.00E+02	na
Ethylene glycol	107-21-1	EPA 8015B	5.00E+03	1.23E+08	5.00E+03	7.30E+03

Table 1 (continued)
List of Site-Related Chemicals and Reporting Limits
Phase B Source Area Investigation Work Plan - Area I
Tronox LLC Facility - Henderson, Nevada

Analyte	CAS No.	Method	Lab RL	RL Goal	Lab RL	RL Goal
		soil / water	soil		water	
Organochlorine Pesticides and PCBs			mg/kg		ug/L	
4,4'-DDD	72-54-8	EPA 8081A	3.30E-03	8.00E-01	5.00E-02	2.80E-02
4,4'-DDE	72-55-9	EPA 8081A	3.30E-03	7.02E-01	5.00E-02	1.98E-02
4,4'-DDT	50-29-3	EPA 8081A	3.30E-03	7.02E-01	5.00E-02	1.98E-02
Aldrin	309-00-2	EPA 8081A	1.70E-03	1.00E-02	5.00E-02	4.00E-02
alpha-BHC	319-84-6	EPA 8081A	1.70E-03	3.59E-02	5.00E-02	1.10E-03
alpha-Chlordane	5103-71-9	EPA 8081A	1.70E-03	6.47E-01	5.00E-02	2.00E+00
beta-BHC	319-85-7	EPA 8081A	1.70E-03	1.00E-04	5.00E-02	3.74E-03
Chlordane, technical	57-74-9	EPA 8081A	8.30E-03	6.47E-01	2.50E-01	2.00E+00
delta-BHC	319-86-8	EPA 8081A	1.70E-03	3.59E-02	5.00E-02	1.10E-03
Dieldrin	60-57-1	EPA 8081A	3.30E-03	1.10E-02	5.00E-02	4.20E-02
Endosulfan I	959-98-8	EPA 8081A	1.70E-03	3.70E+02	5.00E-02	2.19E+01
Endosulfan II	33213-65-9	EPA 8081A	3.30E-03	3.70E+02	5.00E-02	2.19E+01
Endosulfan sulfate	1031-07-8	EPA 8081A	3.30E-03	3.70E+02	5.00E-02	2.19E+01
Endrin	72-20-8	EPA 8081A	3.30E-03	1.85E+01	5.00E-02	2.00E+00
Endrin aldehyde	7421-93-4	EPA 8081A	3.30E-03	4.98E-02	5.00E-02	1.09E+00
Endrin Ketone	53494-70-5	EPA 8081A	3.30E-03	1.85E+01	5.00E-02	1.09E+00
gamma-BHC (Lindane)	58-89-9	EPA 8081A	1.70E-03	1.74E-01	5.00E-02	2.00E-01
gamma-Chlordane	5103-74-2	EPA 8081A	1.70E-03	6.47E-01	5.00E-02	1.20E+00
Heptachlor	76-44-8	EPA 8081A	1.70E-03	3.83E-02	5.00E-02	4.00E-01
Heptachlor epoxide	1024-57-3	EPA 8081A	1.70E-03	1.89E-02	5.00E-02	2.00E-01
Hexachlorobenzene	118-74-1	EPA 8081A	1.70E-03	1.00E-01	5.00E-02	1.00E+00
Methoxychlor	72-43-5	EPA 8081A	1.70E-02	8.00E+00	5.00E-01	4.00E+01
Toxaphene	8001-35-2	EPA 8081A	3.30E-02	1.57E-01	1.00E+00	3.00E+00
Aroclor 1016	12674-11-2	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01
Aroclor 1221	11104-28-2	EPA 8082	6.70E-02	2.03E-01	4.00E-01	5.00E-01
Aroclor 1232	11141-16-5	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01
Aroclor 1242	53469-21-9	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01
Aroclor 1248	12672-29-6	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01
Aroclor 1254	11097-69-1	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01
Aroclor 1260	11096-82-5	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01

Table 1 (continued)
List of Site-Related Chemicals and Reporting Limits
Phase B Source Area Investigation Work Plan - Area I
Tronox LLC Facility - Henderson, Nevada

Analyte	CAS No.	Method soil / water	Lab RL soil	RL Goal soil	Lab RL water	RL Goal water
Dioxins & Furans			ng/kg			
1,2,3,4,6,7,8,9-Ocatchlorodibenzofuran	39001-02-0	EPA 1613B/ 8290	5.90E-01	*	na	na
1,2,3,4,6,7,8,9-Ocatchlorodibenzo-p-dioxin	3268-87-9	EPA 1613B/ 8290	5.70E-01	*	na	na
1,2,3,4,6,7,8-Heptatchlorodibenzofuran	67562-39-4	EPA 1613B/ 8290	2.20E-01	*	na	na
1,2,3,4,6,7,8-Heptatchlorodibenzo-p-dioxin	35822-46-9	EPA 1613B/ 8290	2.60E-01	*	na	na
1,2,3,4,7,8,9-Heptatchlorodibenzofuran	55673-89-7	EPA 1613B/ 8290	3.50E-01	*	na	na
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	EPA 1613B/ 8290	9.00E-02	*	na	na
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	EPA 1613B/ 8290	1.90E-01	*	na	na
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	EPA 1613B/ 8290	1.00E-01	*	na	na
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	EPA 1613B/ 8290	1.90E-01	*	na	na
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	EPA 1613B/ 8290	1.50E-01	*	na	na
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	EPA 1613B/ 8290	1.90E-01	*	na	na
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	EPA 1613B/ 8290	1.40E-01	*	na	na
1,2,3,7,8-Pentachlorodibenzof-p-dioxin	40321-76-4	EPA 1613B/ 8290	1.50E-01	*	na	na
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	EPA 1613B/ 8290	1.10E-01	*	na	na
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	EPA 1613B/ 8290	1.60E-01	*	na	na
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	EPA 1613B/ 8290	1.20E-01	*	na	na
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	EPA 1613B/ 8290	1.70E-01	1.00E+03	na	na
Radionuclides			pCi/g		pCi/L	
Radium 226	13982-63-3	EPA 9015/ 903.1	5.00E-01	2.60E-03	1.00E+00	5.00E+00
Radium 228	15262-20-1	EPA 9320/ 904.0	5.00E-01	8.10E-09	3.00E+00	5.00E+00
Thorium 228	14274-82-9	EML HASL 300 Alpha Spec	5.00E-02	3.62E-10	3.00E-02	1.59E-02
Thorium 230	14269-63-7	EML HASL 300 Alpha Spec	5.00E-02	1.49E-05	3.00E-02	5.23E-02
Thorium 232	7440-29-1	EML HASL 300 Alpha Spec	1.00E-01	1.90E+00	3.00E-02	4.71E-02
Uranium 234	13966-29-5	EML HASL 300 Alpha Spec	4.00E-02	1.53E-02	3.00E-02	6.74E-02
Uranium 235	15117-96-1	EML HASL 300 Alpha Spec	4.00E-02	1.53E-02	3.00E-02	6.63E-02
Uranium 238	7440-61-1	EML HASL 300 Alpha Spec	4.00E-02	1.53E-02	3.00E-02	5.47E-02

Table 1 (continued)
List of Site-Related Chemicals and Reporting Limits
Phase B Source Area Investigation Work Plan - Area I
Tronox LLC Facility - Henderson, Nevada

Analyte	CAS No.	Method soil / water	Lab RL soil	RL Goal soil	Lab RL water	RL Goal water
VOCs			mg/kg		ug/L	
1,1,1,2-Tetrachloroethane	630-20-6	EPA 8260	5.00E-03	7.28E-01	1.00E+00	4.32E-02
1,1,1-Trichloroethane	71-55-6	EPA 8260	5.00E-03	1.00E-01	1.00E+00	2.00E+02
1,1,2,2-Tetrachloroethane	79-34-5	EPA 8260	5.00E-03	9.29E-02	1.00E+00	5.53E-03
1,1,2-Trichloroethane	79-00-5	EPA 8260	5.00E-03	1.61E-01	1.00E+00	5.00E+00
1,1-Dichloroethane	75-34-3	EPA 8260	5.00E-03	1.00E+00	1.00E+00	8.11E+01
1,1-Dichloroethene	75-35-4	EPA 8260	5.00E-03	4.13E+01	1.00E+00	7.00E+00
1,1-Dichloropropene	563-58-6	EPA 8260	5.00E-03	1.76E-01	2.00E+00	3.95E-02
1,2,3-Trichlorobenzene	120-82-1	EPA 8260	5.00E-03	2.34E-01	2.00E+00	7.00E+01
1,2,3-Trichloropropane	96-18-4	EPA 8260	5.00E-03	7.60E-03	2.00E+00	5.60E-04
1,2,4-Trichlorobenzene	120-82-1	EPA 8260	5.00E-03	3.00E-01	2.00E+00	7.00E+01
1,2,4-Trimethylbenzene	95-63-6	EPA 8260	5.00E-03	1.70E+01	2.00E+00	1.23E+00
1,2-Dibromo-3-chloropropane	96-12-8	EPA 8260	5.00E-03	2.02E-01	5.00E+00	2.00E-01
1,2-Dibromoethane	106-93-4	EPA 8260	5.00E-03	7.30E-03	1.00E+00	5.00E-02
1,2-Dichlorobenzene	95-50-1	EPA 8260	5.00E-03	9.00E-01	2.00E+00	2.60E+02
1,2-Dichloroethane	107-06-2	EPA 8260	5.00E-03	1.00E-03	1.00E+00	5.00E+00
1,2-Dichloropropane	78-87-5	EPA 8260	5.00E-03	7.42E-02	1.00E+00	5.00E+00
1,3,5-Trimethylbenzene	108-67-8	EPA 8260	5.00E-03	1.60E-03	2.00E+00	1.23E+00
1,3-Dichlorobenzene	541-73-1	EPA 8260	5.00E-03	1.80E-02	2.00E+00	1.83E+01
1,3-Dichloropropane	142-28-9	EPA 8260	5.00E-03	3.61E+01	2.00E+00	1.22E+01
1,4-Dichlorobenzene	106-46-7	EPA 8260	5.00E-03	1.00E-01	2.00E+00	7.50E+01
2,2-Dichloropropane	594-20-7	EPA 8260	5.00E-03	7.42E-02	2.00E+00	1.65E-02
2-Butanone	78-93-3	EPA 8260	1.00E-02	7.82E-02	1.00E+01	6.97E+02
2-Chlorotoluene	95-49-8	EPA 8260	5.00E-03	4.30E-03	5.00E+00	1.22E+01
2-Hexanone	591-78-6	EPA 8260	1.00E-02	2.79E-02	1.00E+01	2.00E+02
4-Chlorotoluene	106-43-4	EPA 8260	5.00E-03	5.60E+01	5.00E+00	1.22E+01
4-Methyl-2-pentanone	108-10-1	EPA 8260	1.00E-02	4.70E+03	1.00E+01	1.99E+02
Acetone	67-64-1	EPA 8260	2.00E-02	8.00E-01	2.00E+01	5.48E+02
Benzene	71-43-2	EPA 8260	5.00E-03	2.00E-03	1.00E+00	5.00E+00
Bromobenzene	108-86-1	EPA 8260	5.00E-03	9.22E+00	2.00E+00	2.03E+00
Bromochloromethane	74-97-5	EPA 8260	5.00E-03	1.83E-01	2.00E+00	1.81E-02

Table 1 (continued)
List of Site-Related Chemicals and Reporting Limits
Phase B Source Area Investigation Work Plan - Area I
Tronox LLC Facility - Henderson, Nevada

Analyte	CAS No.	Method	Lab RL	RL Goal	Lab RL	RL Goal
		soil / water	soil		water	
VOCs			mg/kg		ug/L	
Bromodichloromethane	75-27-4	EPA 8260	5.00E-03	1.83E-01	1.00E+00	2.10E-01
Bromoform	75-25-2	EPA 8260	5.00E-03	4.00E-02	1.00E+00	8.30E-04
Bromomethane	74-83-9	EPA 8260	5.00E-03	1.31E+00	2.00E+00	8.66E-01
Carbon Tetrachloride	56-23-5	EPA 8260	5.00E-03	3.00E-03	1.00E+00	5.00E+00
Chlorobenzene	108-90-7	EPA 8260	5.00E-03	7.00E-02	1.00E+00	3.90E+01
Chloroethane	75-00-3	EPA 8260	5.00E-03	6.49E-01	2.00E+00	4.64E-01
Chloroform	67-66-3	EPA 8260	5.00E-03	3.00E-02	1.00E+00	8.00E+01
Chloromethane	74-87-3	EPA 8260	5.00E-03	1.56E+01	2.00E+00	6.70E-01
cis-1,2-Dichloroethene	156-92-2	EPA 8260	5.00E-03	1.46E+01	1.00E+00	7.00E+01
cis-1,3-Dichloropropene	10061-01-5	EPA 8260	5.00E-03	1.76E-01	1.00E+00	3.95E-02
Dibromochloromethane	124-48-1	EPA 8260	5.00E-03	2.55E-01	1.00E+00	3.20E-01
Dibromomethane	74-95-3	EPA 8260	5.00E-03	2.34E+01	1.00E+00	6.08E+00
Dichlorodifluoromethane	75-71-8	EPA 8260	5.00E-03	3.08E+01	1.00E+00	3.95E+01
Diisopropyl ether (DIPE)	108-20-3	EPA 8260	5.00E-03	na	1.00E+00	na
Ethylbenzene	100-41-4	EPA 8260	5.00E-03	7.40E+02	1.00E+00	7.00E+02
Ethyl-tert-butyl ether (ETBE)	637-92-3	EPA 8260	5.00E-03	3.64E+00	1.00E+00	1.10E+00
Hexachlorobutadiene	87-68-3	EPA 8260	5.00E-03	1.00E-01	5.00E+00	8.62E-02
Isopropyl Benzene	98-28-8	EPA 8260	5.00E-03	2.00E+02	2.00E+00	6.58E+01
Methylene Chloride	75-09-2	EPA 8260	5.00E-03	1.00E-03	2.00E+00	5.00E+00
Methyl-tert-butyl ether (MTBE)	1634-04-4	EPA 8260	5.00E-03	3.64E+00	1.00E+00	2.00E+01
Naphthalene	91-20-3	EPA 8260	5.00E-03	4.00E+00	2.00E+00	6.20E-01
n-Butylbenzene	104-51-8	EPA 8260	5.00E-03	2.19E+02	2.00E+00	2.43E+01
n-Propylbenzene	103-65-1	EPA 8260	5.00E-03	2.19E+02	2.00E+00	2.43E+01
p-Isopropyltoluene	99-87-6	EPA 8260	5.00E-03	9.00E+01	2.00E+00	2.06E+01
sec-Butylbenzene	135-98-8	EPA 8260	5.00E-03	1.63E+02	2.00E+00	2.43E+01
Styrene	100-42-5	EPA 8260	5.00E-03	1.80E+03	1.00E+00	1.00E+02
tert-Amyl-methyl ether (TAME)	994-05-8	EPA 8260	5.00E-03	na	1.00E+00	na
tert-Butyl alcohol (TBA)	75-65-0	EPA 8260	1.00E-01	na	1.00E+02	na
tert-Butylbenzene	98-06-6	EPA 8260	5.00E-03	1.97E+02	2.00E+00	2.43E+01
Tetrachloroethene	127-18-4	EPA 8260	5.00E-03	3.00E-03	1.00E+00	5.00E+00

Table 1 (continued)
List of Site-Related Chemicals and Reporting Limits
Phase B Source Area Investigation Work Plan - Area I
Tronox LLC Facility - Henderson, Nevada

Analyte	CAS No.	Method soil / water	Lab RL soil	RL Goal soil	Lab RL water	RL Goal water
VOCs			mg/kg		ug/L	
Toluene	108-88-3	EPA 8260	5.00E-03	6.00E-01	1.00E+00	1.50E+02
trans-1,2-Dichloroethene	156-60-5	EPA 8260	5.00E-03	2.35E+01	1.00E+00	1.00E+02
trans-1,3-Dichloropropene	10061-02-6	EPA 8260	5.00E-03	1.76E-01	1.00E+00	3.95E-02
Trichloroethene	79-01-6	EPA 8260	5.00E-03	3.00E-03	1.00E+00	5.00E+00
Trichlorofluoromethane	75-69-4	EPA 8260	5.00E-03	1.09E-01	1.00E+00	1.80E+01
Vinyl Chloride	75-01-4	EPA 8260	5.00E-03	7.46E-02	1.00E+00	2.00E+00
Xylenes (total)	1330-20-7	EPA 8260	5.00E-03	9.00E+01	1.00E+00	1.00E+04
SVOCs			mg/kg		ug/L	
1,4-Dioxane	123-91-1	EPA 8270	6.60E-02	1.57E+01	2.00E-01	6.11E-01
2-Methylnaphthalene	91-57-6	EPA 8270	6.60E-03	1.88E+01	2.00E-01	6.20E-01
Acenaphthene	83-32-9	EPA 8270	6.60E-03	2.92E+03	2.00E-01	3.65E+01
Acenaphthylene	208-96-8	EPA 8270	6.60E-03	2.92E+03	2.00E-01	3.65E+01
Anthracene	120-12-7	EPA 8270	6.60E-03	2.40E+04	2.00E-01	1.83E+02
Benzo(a)anthracene	56-55-3	EPA 8270	6.60E-03	8.00E-02	2.00E-01	9.21E-03
Benzo(a)pyrene	50-32-8	EPA 8270	6.60E-03	2.11E-02	2.00E-01	2.00E-01
Benzo(b)fluoranthene	205-99-2	EPA 8270	6.60E-03	2.00E-01	2.00E-01	9.21E-03
Benzo(g,h,i)perylene	191-24-2	EPA 8270	6.60E-03	7.17E+01	2.00E-01	1.83E+01
Benzo(k)fluoranthene	207-08-9	EPA 8270	6.60E-03	2.00E+00	2.00E-01	9.21E-02
Bis(2-ethylhexyl)phthalate	117-81-7	EPA 8270	6.60E-03	1.23E+01	2.00E-01	6.00E+00
Butylbenzylphthalate	85-68-7	EPA 8270	6.60E-03	1.23E+04	2.00E-01	7.30E+02
Chrysene	218-01-9	EPA 8270	6.60E-03	8.00E+00	2.00E-01	9.21E-01
Dibenzo(a,h)anthracene	53-70-3	EPA 8270	6.60E-03	2.11E-02	2.00E-01	9.21E-04
Diethylphthalate	84-66-2	EPA 8270	6.60E-03	1.50E+00	2.00E-01	2.92E+03
Dimethylphthalate	131-11-3	EPA 8270	6.60E-03	6.16E+05	2.00E-01	3.65E+04
Di-n-butylphthalate	84-74-2	EPA 8270	6.60E-03	2.70E+02	2.00E-01	3.65E+02
Di-n-octylphthalate	117-84-0	EPA 8270	6.60E-03	2.46E+03	2.00E-01	1.46E+02
Fluoranthene	206-44-0	EPA 8270	6.60E-03	2.10E+02	2.00E-01	1.46E+02
Fluorene	86-73-7	EPA 8270	6.60E-03	2.63E+03	2.00E-01	2.43E+01
Hexachlorobenzene	118-74-1	EPA 8270	6.60E-03	1.00E-01	2.00E-01	1.00E+00

Table 1 (continued)
List of Site-Related Chemicals and Reporting Limits
Phase B Source Area Investigation Work Plan - Area I
Tronox LLC Facility - Henderson, Nevada

Analyte	CAS No.	Method soil / water	Lab RL soil	RL Goal soil	Lab RL water	RL Goal water
SVOCs			mg/kg		ug/L	
Indeno(1,2,3-cd)pyrene	193-39-5	EPA 8270	6.60E-03	2.11E-01	2.00E-01	9.21E-03
Naphthalene	91-20-3	EPA 8270	6.60E-03	4.00E+00	2.00E-01	6.20E-01
Nitrobenzene	98-95-3	EPA 8270	6.60E-03	1.03E+01	2.00E-01	3.40E-01
Octachlorostyrene	29082-74-4	EPA 8270	6.60E-03	na	2.00E-01	na
Phenanthrene	85-01-8	EPA 8270	6.60E-03	9.60E+00	2.00E-01	1.80E+02
Pyrene	129-00-0	EPA 8270	6.60E-03	2.10E+02	2.00E-01	1.83E+01
Pyridine	110-86-1	EPA 8270	6.60E-03	6.16E+01	2.00E-01	3.65E+00
Asbestos			structures/gPM10			
Amphibole Protocol Structures	na	EPA/540/R-97/028 modified	3.00E+06	na	na	na
Chrysotile Protocol Structures	na	EPA/540/R-97/028 modified	3.00E+06	na	na	na
Formaldehyde			mg/kg		ug/L	
Formaldehyde	50-00-0	EPA 8315A	1.00E+03	1.0E+04	8.00E+00	5.5E+02

** RL Goal for the TEQ sum for all congeners is 1000 pg/g*
na = not applicable

Table 2
Soil Sampling and Analysis Plan
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Grid Location	LOU Number	Phase B Boring No.	Sample ID Number	Sample Depths (ft, bgs)	Perchlorate (EPA 314.0)	Metals (EPA 6020)	Hex Cr (EPA 7199)	TPH-DRO/ORO (EPA 8015B)	TPH-GRO (EPA 8015B)	VOCs [1] (EPA 8260B)	Wet Chemistry [2]	OCPs [3] (8081A)	SVOCs [4] (EPA 8270C)	Radio-nuclides [5]	Dioxins/Furans [6]	Formaldehyde Titrant (EPA 8315A)	Asbestos EPA/540/R-97/028	Location Description and Characterized Area Rationale
Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 1 (H-2) and ending with the southeastern most grid in Area I (O-4).																		
H-3	1, 10	RSAH3	RSA3-0.0	0.0													X	Boring located to evaluate LOU 1 (former Trade Effluent Settling Ponds) and for general site coverage.
H-3	1, 10		RSA3-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
H-3	1, 10		RSA3-10	10	X	X	X	X		X	X	Hold	X	X				
H-3	1, 10		RSA3-20	20	X	X	X	X		X	X		X	X				
H-3	1, 10		RSA3-30	30	X	X	X	X		X	X		X	X				
I-2	1, 10	RSAI2	RSAI2-0.0	0.0													X	Boring located to evaluate LOU 1 (former Trade Effluent Settling Ponds) and as an eastward step-out to LOU 10 (Former Onsite Hazardous Waste Landfill).
I-2	1, 10		RSAI2-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
I-2	1, 10		RSAI2-10	10	X	X	X	X		X	X	Hold	X	X				
I-2	1, 10		RSAI2-20	20	X	X	X	X		X	X		X	X				
I-2	1, 10		RSAI2-30	30	X	X	X	X		X	X		X	X				
I-3	1, 32	RSAI3	RSAI3-0.0	0.0													X	Boring located on the west berm of the GW-11 Pond to evaluate LOU 1(former Trade Effluent Settling Ponds) and LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit).
I-3	1, 32		RSAI3-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
I-3	1, 32		RSAI3-10	10	X	X	X	X		X	X	Hold	X	X				
I-3	1, 32		RSAI3-20	20	X	X	X	X		X	X		X	X				
I-3	1, 32		RSAI3-25	25	X	X	X	X		X	X		X	X				
I-3	1, 32	SA201	SA201-0.0	0													X	Boring located to evaluate LOU 1 (former Trade Effluent Settling Ponds) and for general site coverage.
I-3	1, 32		SA201-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
I-3	1, 32		SA201-10	10	X	X	X	X		X	X	Hold	X	X				
I-3	1, 32		SA201-20	20	X	X	X	X		X	X		X	X				
I-3	1, 32		SA201-25	25	X	X	X	X		X	X		X	X				
I-4	1, 32	RSAI4	RSAI4-0.0	0.0													X	Boring located on the north berm of the GW-11 Pond to evaluate LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit), to evaluate LOU 1 (former Trade Effluent Settling Ponds) and for general site coverage.
I-4	1, 32		RSAI4-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
I-4	1, 32		RSAI4-10	10	X	X	X	X		X	X	Hold	X	X				
I-4	1, 32		RSAI4-20	20	X	X	X	X		X	X		X	X				
I-4	1, 32		RSAI4-30	30	X	X	X	X		X	X		X	X				
I-5	1, 32	RSAI5	RSAI5-0.0	0.0													X	Boring located on the north berm of the GW-11 Pond to evaluate LOU 32
I-5	1, 32		RSAI5-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
I-5	1, 32		RSAI5-10	10	X	X	X	X		X	X	Hold	X	X				
I-5	1, 32		RSAI5-20	20	X	X	X	X		X	X		X	X				
I-5	1, 32		RSAI5-30	30	X	X	X	X		X	X		X	X				
I-7	1, 22, 23, 32	RSAI7	RSAI7-0.0	0.0													X	Boring located to evaluate LOU 1 (former Trade Effluent Settling Ponds), LOUs 22 & 23 (Ponds WC-West & WC-East), and LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit).
I-7	1, 22, 23, 32		RSAI7-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
I-7	1, 22, 23, 32		RSAI7-10	10	X	X	X	X		X	X	Hold	X	X				
I-7	1, 22, 23, 32		RSAI7-20	20	X	X	X	X		X	X		X	X				
I-7	1, 22, 23, 32		RSAI7-30	30	X	X	X	X		X	X		X	X				
J-2	1, 10	RSAJ2	RSAJ2-0.0	0.0													X	Boring located to evaluate LOU 1 (former Trade Effluent Settling Ponds) and to investigate potential offsite VOC sources.
J-2	1, 10		RSAJ2-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
J-2	1, 10		RSAJ2-10	10	X	X	X	X		X	X	Hold	X	X				
J-2	1, 10		RSAJ2-20	20	X	X	X	X		X	X		X	X				
J-2	1, 10		RSAJ2-30	30	X	X	X	X		X	X		X	X				
J-3	1, 32	RSAJ3	RSAJ3-0.0	0.0													X	Boring located to evaluate LOU 1 (former Trade Effluent Settling Ponds) and for general site coverage.
J-3	1, 32		RSAJ3-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
J-3	1, 32		RSAJ3-10	10	X	X	X	X		X	X	Hold	X	X				
J-3	1, 32		RSAJ3-20	20	X	X	X	X		X	X		X	X				
J-3	1, 32		RSAJ3-30	30	X	X	X	X		X	X		X	X				
J-3	1, 32	SA202	SA202-0.0	0.0													X	Boring located to evaluate LOU 1 (former Trade Effluent Settling Ponds) and for general site coverage.
J-3	1, 32		SA202-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
J-3	1, 32		SA202-10	10	X	X	X	X		X	X	Hold	X	X				
J-3	1, 32		SA202-20	20	X	X	X	X		X	X		X	X				
J-3	1, 32		SA202-30	30	X	X	X	X		X	X		X	X				
J-5	1, 22, 23, 32	RSAJ5	RSAJ5-0.0	0.0													X	Boring located east of GW-11 Pond (LOU 32-Chromium and Perchlorate Groundwater Remediation Unit) to evaluate LOU 1 (former Trade Effluent Pond area), as an upgradient boring to evaluate LOU 22 (Pond WC-West and associated piping), and for general site coverage.
J-5	1, 22, 23, 32		RSAJ5-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
J-5	1, 22, 23, 32		RSAJ5-10	10	X	X	X	X		X	X	Hold	X	X				
J-5	1, 22, 23, 32		RSAJ5-20	20	X	X	X	X		X	X		X	X				
J-5	1, 22, 23, 32		RSAJ5-25	25	X	X	X	X		X	X		X	X				
J-6	1, 22, 23, 32	RSAJ6	RSAJ6-0.0	0.0													X	Boring located east of GW-11 Pond (LOU 32-Chromium and Perchlorate Groundwater Remediation Unit) to evaluate LOU 1 (former Trade Effluent Pond area), as an upgradient boring to evaluate LOU 22 (Pond WC-West and associated piping), and for general site coverage.
J-6	1, 22, 23, 32		RSAJ6-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
J-6	1, 22, 23, 32		RSAJ6-10	10	X	X	X	X		X	X	Hold	X	X				
J-6	1, 22, 23, 32		RSAJ6-20	20	X	X	X	X		X	X		X	X				
J-6	1, 22, 23, 32		RSAJ6-30	30	X	X	X	X		X	X		X	X				

Table 2 (Continued)
Soil Sampling and Analysis Plan
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Grid Location	LOU Number	Phase B Boring No.	Sample ID Number	Sample Depths (ft, bgs)	Perchlorate (EPA 314.0)	Metals (EPA 6020)	Hex Cr (EPA 7199)	TPH-DRO/ORO (EPA 8015B)	TPH-GRO (EPA 8015B)	VOCs [1.] (EPA 8260B)	Wet Chemistry [2.]	OCPs [3.] (8081A)	SVOCs [4.] (EPA 8270C)	Radio-nuclides [5.]	Dioxins/Furans [6.]	Formaldehyde Titrant (EPA 8315A)	Asbestos EPA/540/R-97/028	Location Description and Characterized Area Rationale
Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 1 (H-2) and ending with the southeastern most grid in Area I (O-4).																		
J-6	22, 23	SA127	SA127-0.0	0.0													X	Boring located to evaluate white crusty surface soil east of the pump house between LOU 22 and LOU 23 (Ponds WC-West and WC-East).
J-6	22, 23		SA127-0.5	0.5	X	X	X	X		X	X		X	X	X			
J-6	22, 23		SA127-10	10	X	X	X	X		X	X		X	X				
J-7	1, 22, 23, 32	RSAJ7	RSAJ7-0.0	0.0													X	Boring located east of GW-11 Pond (LOU 32-Chromium and Perchlorate Groundwater Remediation Unit) to evaluate LOU 1 (former Trade Effluent Pond area), as an upgradient boring to evaluate LOU 23 (Pond WC-East and associated piping), and for general site coverage.
J-7	1, 22, 23, 32		RSAJ7-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
J-7	1, 22, 23, 32		RSAJ7-10	10	X	X	X	X		X	X	Hold	X	X				
J-7	1, 22, 23, 32		RSAJ7-20	20	X	X	X	X		X	X		X	X				
J-7	1, 22, 23, 32		RSAJ7-30	30	X	X	X	X		X	X		X	X				
J-8	1, 32	SA79	SA79-0.0	0.0													X	Boring located south of Warm Springs Road near Timet boundary to evaluate LOU 1 (former Trade Effluent Settling Pond area).
J-8	1, 32		SA79-0.5	0.5	X	X	X				X	X		X	X			
J-8	1, 32		SA79-10	10	X	X	X				X	Hold		X				
J-8	1, 32		SA79-20	20	X	X	X				X			X				
J-8	1, 32		SA79-25	25	X	X	X				X			X				
J-8	1, 22, 23, 32	RSAJ8	RSAJ8-0.0	0.0													X	Boring located south (downgradient) of Warm Springs Road near Timet boundary to evaluate LOU 1 (former Trade Effluent Settling Pond area) and for general site coverage.
J-8	1, 22, 23, 32		RSAJ8-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
J-8	1, 22, 23, 32		RSAJ8-10	10	X	X	X	X		X	X	Hold	X	X				
J-8	1, 22, 23, 32		RSAJ8-20	20	X	X	X	X		X	X		X	X				
J-8	1, 22, 23, 32		RSAJ8-30	30	X	X	X	X		X	X		X	X				
K-2	2	SA152	SA152-0.0	0.0														Boring located to evaluate LOU 2 (open area south of Trade Effluent Settling Ponds) as a step-out boring to SA18 as requested by NDEP in comments to Phase A report.
K-2	2		SA152-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
K-2	2		SA152-10	10	X	X	X	X		X	X	Hold	X	X				
K-2	2	RSAK2	RSAK2-0.0	0.0													X	Boring located to evaluate LOU 2 (open area south of Trade Effluent Settling Ponds) and to evaluate potential offsite VOC source to the west.
K-2	2		RSAK2-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
K-2	2		RSAK2-10	10	X	X	X	X		X	X	Hold	X	X				
K-2	2		RSAK2-20	20	X	X	X	X		X	X		X	X				
K-2	2		RSAK3-30	30	X	X	X	X		X	X		X	X				
K-3	1, 2, 32	SA88	SA88-0.0	0.0													X	Boring located north (downgradient) of LOU 2 (open area south of Trade Effluent Settling Ponds) and south (upgradient) of LOU 1 (former Trade Effluent Settling Pond area) and for general site coverage.
K-3	1, 2, 32		SA88-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
K-3	1, 2, 32		SA88-10	10	X	X	X	X		X	X	Hold	X	X				
K-3	1, 2, 32		SA88-20	20	X	X	X	X		X	X		X	X				
K-3	1, 2, 32		SA88-30	30	X	X	X	X		X	X		X	X				
K-3	1, 32	RSAK3	RSAK3-0.0	0.0													X	Boring located west of GW-11 Pond to evaluate LOU 1 (former Trade Effluent Pond area) and LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit).
K-3	1, 32		RSAK3-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
K-3	1, 32		RSAK3-10	10	X	X	X	X		X	X	Hold	X	X				
K-3	1, 32		RSAK3-20	20	X	X	X	X		X	X		X	X				
K-3	1, 32		RSAK3-30	30	X	X	X	X		X	X		X	X				
K-3	2, 32, 60	SA134	SA134-0.0	0.0													X	Boring located to evaluate LOU 2 (Open Area South of Trade Effluent Settling Ponds).
K-3	2, 32, 60		SA134-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
K-3	2, 32, 60		SA134-10	10	X	X	X	X		X	X	Hold	X	X				
K-3	2, 32, 60		SA134-20	20	X	X	X	X		X	X		X	X				
K-3	2, 32, 60		SA134030	30	X	X	X	X		X	X		X	X				
K-4	1, 2, 32	RSAK4	RSAK4-0.0	0.0													X	Boring located to evaluate LOU 32 and as an upgradient boring to LOU 1 (former Trade Effluent Settling).
K-4	1, 2, 32		RSAK4-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
K-4	1, 2, 32		RSAK4-10	10	X	X	X	X		X	X	Hold	X	X				
K-4	1, 2, 32		RSAK4-20	20	X	X	X	X		X	X		X	X				
K-4	1, 2, 32		RSAK4-30	30	X	X	X	X		X	X		X	X				
K-5	1, 32	RSAK5	RSAK5-0.0	0.0													X	Boring located to evaluate LOU 1 (former Trade Effluent Settling Ponds).
K-5	1, 32		RSAK5-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
K-5	1, 32		RSAK5-10	10	X	X	X	X		X	X	Hold	X	X				
K-5	1, 32		RSAK5-20	20	X	X	X	X		X	X		X	X				
K-5	1, 32		RSAK5-30	30	X	X	X	X		X	X		X	X				
K-6	1, 32	SA76	SA76-0.0	0.0													X	Boring located north of groundwater recharge trenches to evaluate LOU 1 (former Trade Effluent Settling Ponds) and LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit).
K-6	1, 32		SA76-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
K-6	1, 32		SA76-10	10	X	X	X	X		X	X	Hold	X	X				
K-6	1, 32		SA76-20	20	X	X	X	X		X	X		X	X				
K-6	1, 32		SA76-25	25	X	X	X	X		X	X		X	X				
K-6	1, 32	RSAK6	RSAK6-0.0	0.0													X	Boring located to evaluate LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit).
K-6	1, 32		RSAK6-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
K-6	1, 32		RSAK6-10	10	X	X	X	X		X	X	Hold	X	X				
K-6	1, 32		RSAK6-20	20	X	X	X	X		X	X		X	X				
K-6	1, 32		RSAK6-30	30	X	X	X	X		X	X		X	X				

Table 2 (Continued)
Soil Sampling and Analysis Plan
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Grid Location	LOU Number	Phase B Boring No.	Sample ID Number	Sample Depths (ft, bgs)	Perchlorate (EPA 314.0)	Metals (EPA 6020)	Hex Cr (EPA 7199)	TPH-DRO/ORO (EPA 8015B)	TPH-GRO (EPA 8015B)	VOCs [1.] (EPA 8260B)	Wet Chemistry [2.]	OCPs [3.] (8081A)	SVOCs [4.] (EPA 8270C)	Radio-nuclides [5.]	Dioxins/Furans [6.]	Formaldehyde Titrant (EPA 8315A)	Asbestos EPA/540/R-97/028	Location Description and Characterized Area Rationale
Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 1 (H-2) and ending with the southeastern most grid in Area I (O-4).																		
K-7	1, 22, 23, 32	RSAK7	RSAK7-0.0	0.0													X	Boring located to evaluate LOU 1 (former Trade Effluent Settling Ponds) and LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit), and to evaluate pipeline associated with LOU 22 & LOU 23.
K-7	1, 22, 23, 32		RSAK7-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
K-7	1, 22, 23, 32		RSAK7-10	10	X	X	X	X		X	X	Hold	X	X				
K-7	1, 22, 23, 32		RSAK7-20	20	X	X	X	X		X	X		X	X				
K-7	1, 22, 23, 32		RSAK7-24	24	X	X	X	X		X	X		X	X				
K-8	1, 32	RSAK8	RSAK8-0.0	0.0													X	Boring located to evaluate LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit) and as upgradient location to LOU 1 (former Trade Effluent Settling Ponds), and for general site coverage.
K-8	1, 32		RSAK8-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
K-8	1, 32		RSAK8-10	10	X	X	X	X		X	X	Hold	X	X				
K-8	1, 32		RSAK8-20	20	X	X	X	X		X	X		X	X				
K-8	1, 32		RSAK8-27	27	X	X	X	X		X	X		X	X				
L-2	2	RSAL2	RSAL2-0.0	0.0													X	Boring located to evaluate LOU 2 (Open Area South of Trade Effluent Settling Ponds).
L-2	2		RSAL2-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
L-2	2		RSAL2-10	10	X	X	X	X		X	X	Hold	X	X				
L-2	2		RSAL2-20	20	X	X	X	X		X	X		X	X				
L-2	2		RSAL2-30	30	X	X	X	X		X	X		X	X				
L-3	2, 32, 60	SA82	SA82-0.0	0.0													X	Boring located to evaluate LOU 2 (open area south of Trade Effluent Disposal Ponds) and to evaluate pipeline route for LOU 60 (Acid Drain System).
L-3	2, 32, 60		SA82-0.5	0.5	X	X	X			X	X	X		X	X			
L-3	2, 32, 60		SA82-10	10	X	X	X			X	X	Hold		X				
L-3	2, 32, 60		SA82-20	20	X	X	X			X	X			X				
L-3	2, 32, 60		SA82-30	30	X	X	X			X	X			X				
L-3	2	RSAL3	RSAL3-0.0	0.0													X	Boring located to evaluate LOU 2 (open area south of Trade Effluent Disposal Ponds).
L-3	2		RSAL3-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
L-3	2		RSAL3-10	10	X	X	X	X		X	X	Hold	X	X				
L-3	2		RSAL3-20	20	X	X	X	X		X	X		X	X				
L-3	2		RSAL3-30	30	X	X	X	X		X	X		X	X				
L-4	32, 60	SA189	SA189-0.0	0.0													X	Boring located to evaluate former Acid Drain System (LOU 60) pipeline/flume route.
L-4	32, 60		SA189-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
L-4	32, 60		SA189-10	10	X	X	X	X		X	X	Hold	X	X				
L-4	2, 32	RSAL4	RSAL4-0.0	0.0													X	Boring located to evaluate former Acid Drain System (LOU 60) pipeline/flume route and as a step-out to LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit).
L-4	2, 32		RSAL4-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
L-4	2, 32		RSAL4-10	10	X	X	X	X		X	X	Hold	X	X				
L-4	2, 32		RSAL4-20	20	X	X	X	X		X	X		X	X				
L-4	2, 32		RSAL4-25	25	X	X	X	X		X	X		X	X				
L-5	32, 58	SA74	SA74-0.0	0.0													X	Boring located adjacent to new D-1 bldg. to evaluate LOU 58 (AP Plant Area New Building D-1 Washdown) and to evaluate LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit).
L-5	32, 58		SA74-0.5	0.5	X	X	X	X		X	X		X	X	X			
L-5	32, 58		SA74-10	10	X	X	X	X		X	X		X	X				
L-5	32, 58		SA74-20	20	X	X	X	X		X	X		X	X				
L-5	32, 58		SA74-25	25	X	X	X	X		X	X		X	X				
L-5	32, 58	RSAL5	RSAL5-0.0	0.0													X	Boring located to evaluate LOU 58 (AP Plant Area New Building D-1 Washdown) and to evaluate LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit).
L-5	32, 58		RSAL5-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
L-5	32, 58		RSAL5-10	10	X	X	X	X		X	X	Hold	X	X				
L-5	32, 58		RSAL5-20	20	X	X	X	X		X	X		X	X				
L-5	32, 58		RSAL5-25	25	X	X	X	X		X	X		X	X				
L-7	22, 23	RSAL7	RSAL7-0.0	0.0													X	Boring located to serve as a step out to the northeast for LOU 57 (AP Plant and Associated Pipelines), and to evaluate pipeline associated with LOU 23 (Pond WC-East), and for general site coverage.
L-7	22, 23		RSAL7-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
L-7	22, 23		RSAL7-10	10	X	X	X	X		X	X	Hold	X	X				
L-7	32, 57	SA75	SA75-0.0	0.0													X	Boring located to evaluate LOU 32 (Chromium and Perchlorate Groundwater Remediation Unit).
L-7	32, 57		SA75-0.5	0.5	X	X	X	X		X	X		X	X	X			
L-7	32, 57		SA75-10	10	X	X	X	X		X	X		X	X				
L-7	32, 57		SA75-20	20	X	X	X	X		X	X		X	X				
L-7	32, 57		SA75-24	24	X	X	X	X		X	X		X	X				
L-8	5	RSAL8	RSAL8-0.0	0.0													X	Boring located north of Beta Ditch (LOU 5) along Timet boundary as a downgradient boring to LOU 5 and for general site coverage.
L-8	5		RSAL8-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
L-8	5		RSAL8-10	10	X	X	X	X		X	X	Hold	X	X				
L-8	5		RSAL8-20	20	X	X	X	X		X	X		X	X				
L-8	5		RSAL8-30	30	X	X	X	X		X	X		X	X				
M-2	2	RSAM2	RSAM2-0.0	0.0													X	Boring located north of Beta Ditch along Olin (Pioneer) boundary; to evaluate potential VOC sources from the west, as a step-out boring for LOU 2 (open area south of the Trade Effluent Settling Ponds), and for general site coverage.
M-2	2		RSAM2-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
M-2	2		RSAM2-10	10	X	X	X	X		X	X	Hold	X	X				
M-2	2		RSAM2-20	20	X	X	X	X		X	X		X	X				
M-2	2		RSAM2-30	30	X	X	X	X		X	X		X	X				

Table 2 (Continued)
Soil Sampling and Analysis Plan
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Grid Location	LOU Number	Phase B Boring No.	Sample ID Number	Sample Depths (ft, bgs)	Perchlorate (EPA 314.0)	Metals (EPA 6020)	Hex Cr (EPA 7199)	TPH-DRO/ORO (EPA 8015B)	TPH-GRO (EPA 8015B)	VOCs [1] (EPA 8260B)	Wet Chemistry [2]	OCPs [3] (8081A)	SVOCs [4] (EPA 8270C)	Radio-nuclides [5]	Dioxins/Furans [6]	Formaldehyde Titrant (EPA 8315A)	Asbestos EPA/540/R-97/028	Location Description and Characterized Area Rationale
Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 1 (H-2) and ending with the southeastern most grid in Area I (O-4).																		
M-2	5	SA67	SA67-0.0	0.0													X	Boring located near west-end of Beta Ditch close to Olin (formerly Pioneer) Chemical boundary to investigate potential offsite VOC sources from the west and LOU 5 (Beta Ditch).
M-2	5		SA67-0.5	0.5	X	X	X			X	X	X	X	X	X			
M-2	5		SA67-10	10	X	X	X			X	X	Hold	X	X				
M-2	5		SA67-20	20	X	X	X			X	X		X	X				
M-2	5		SA67-30	30	X	X	X			X	X		X	X				
M-2	5		SA67-35	35	X	X	X			X	X		X	X				
M-3	2	SA100	SA100-0.0	0.0													X	Boring located to evaluate LOU 2 (open area south of Trade Effluent Settling Ponds) and evaluate potential VOC sources from the west.
M-3	2		SA100-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
M-3	2		SA100-10	10	X	X	X	X		X	X	Hold	X	X				
M-3	2		SA100-20	20	X	X	X	X		X	X		X	X				
M-3	2		SA100-30	30	X	X	X	X		X	X		X	X				
M-3	2	RSAM3	RSAM3-0.0	0.0													X	Boring to evaluate LOU 2 (open area south of Trade Effluent Settling Ponds).
M-3	2		RSAM3-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
M-3	2		RSAM3-10	10	X	X	X	X		X	X	Hold	X	X				
M-3	2		RSAM3-20	20	X	X	X	X		X	X		X	X				
M-3	2		RSAM3-30	30	X	X	X	X		X	X		X	X				
M-4	2	SA69	SA69-0.0	0.0													X	Boring located north of Beta Ditch as a step-out to LOUs 2 (open area south of Trade Effluent Settling Ponds) and 57 (AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SI's and Transfer Lines) and to investigate for potential offsite VOC sources from the west.
M-4	2		SA69-0.5	0.5	X	X	X			X	X	X	X	X	X			
M-4	2		SA69-10	10	X	X	X			X	X	Hold	X	X				
M-4	2		SA69-20	20	X	X	X			X	X		X	X				
M-4	2		SA69-30	30	X	X	X			X	X		X	X				
M-4	2	RSAM4	RSAM4-0.0	0.0													X	Boring located for general area coverage.
M-4	2		RSAM4-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
M-4	2		RSAM4-10	10	X	X	X	X		X	X	Hold	X	X				
M-4	2		RSAM4-20	20	X	X	X	X		X	X		X	X				
M-4	2		RSAM4-30	30	X	X	X	X		X	X		X	X				
M-4	5	SA66	SA66-0.0	0.0													X	Boring located at the "Y" intersection in Beta Ditch (LOU 5) to evaluate Beta Ditch and for general site coverage.
M-4	5		SA66-0.5	0.5	X	X	X	X		X	X	X		X	X			
M-4	5		SA66-10	10	X	X	X	X		X	X	Hold		X				
M-4	5		SA66-20	20	X	X	X	X		X	X			X				
M-4	5		SA66-30	30	X	X	X	X		X	X			X				
M-4	5		SA66-35	35	X	X	X	X		X	X			X				
N-2	35	SA56	SA56-0.0	0.0													X	Boring located along western Site boundary to evaluate LOU 35 (former Truck Emptying/Dumping Site) and potential offsite VOC sources from the west. PCBs and TPH-G were detected in Phase A soil boring SA09.
N-2	35		SA56-0.5	0.5	X	X	X	X	X	X	X	X	X	X	X			
N-2	35		SA56-10	10	X	X	X	X	X	X	X	Hold	X	X				
N-2	35		SA56-20	20	X	X	X	X	X	X	X		X	X				
N-2	35		SA56-30	30	X	X	X	X	X	X	X		X	X				
N-2	35		SA56-40	40	X	X	X	X	X	X	X		X	X				
N-2	35	RSAN2	RSAN2-0.0	0.0													X	Boring located along western Site boundary north of LOU 35 (former Truck Emptying/Dumping Site) as downgradient well and to evaluate potential offsite VOC sources from the west and for general site coverage.
N-2	35		RSAN2-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
N-2	35		RSAN2-10	10	X	X	X	X		X	X	Hold	X	X				
N-2	35		RSAN2-20	20	X	X	X	X		X	X		X	X				
N-2	35		RSAN2-30	30	X	X	X	X		X	X		X	X				
N-2	35		RSAN2-40	40	X	X	X	X		X	X		X	X				
N-3	54	SA85	SA85-0.0	0.0													X	Boring located northwest of AP Lab bldg. to evaluate LOU 54 (AP Lab septic tank). Dilute formaldehyde titrant was used in LOU 38 (Former Satellite Accumulation Point, AP-Laboratory) and possibly discharged to LOU 54.
N-3	54		SA85-0.5	0.5	X	X	X			X	X	X	X	X	X	X		
N-3	54		SA85-10	10	X	X	X			X	X	Hold	X	X		X		
N-3	54		SA85-20	20	X	X	X			X	X		X	X		X		
N-3	54		SA85-30	30	X	X	X			X	X		X	X		X		
N-3	54		SA85-35	35	X	X	X			X	X		X	X		X		
N-3	38	RSAN3	RSAN3-0.0	0.0													X	Boring located to evaluate LOU 38 (Former Satellite Accumulation Point, AP-Laboratory). Dilute formaldehyde titrant was used in the AP-Laboratory.
N-3	38		RSAN3-0.5	0.5	X	X	X	X		X	X	X	X	X	X	X		
N-3	38		RSAN3-10	10	X	X	X	X		X	X	Hold	X	X		X		
N-3	38		RSAN3-20	20	X	X	X	X		X	X		X	X		X		
N-3	38		RSAN3-30	30	X	X	X	X		X	X		X	X		X		
N-3	38		RSAN3-40	40	X	X	X	X		X	X		X	X		X		
N-4	39	SA87	SA87-0.0	0.0													X	Boring located at the southeast corner of the AP Maintenance shop building to evaluate LOU 39 (Satellite Accumulation Point-AP Laboratory).
N-4	39		SA87-0.5	0.5	X	X	X	X		X	X			X	X			
N-4	39		SA87-10	10	X	X	X	X		X	X			X				
N-4	39		SA87-20	20	X	X	X	X		X	X			X				
N-4	39		SA87-30	30	X	X	X	X		X	X			X				
N-4	39		SA87-40	40	X	X	X	X		X	X			X				

Table 2 (Continued)
Soil Sampling and Analysis Plan
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Grid Location	LOU Number	Phase B Boring No.	Sample ID Number	Sample Depths (ft, bgs)	Perchlorate (EPA 314.0)	Metals (EPA 6020)	Hex Cr (EPA 7199)	TPH-DRO/ORO (EPA 8015B)	TPH-GRO (EPA 8015B)	VOCs [1.] (EPA 8260B)	Wet Chemistry [2.]	OCPs [3.] (8081A)	SVOCs [4.] (EPA 8270C)	Radio-nuclides [5.]	Dioxins/Furans [6.]	Formaldehyde Titrant (EPA 8315A)	Asbestos EPA/540/R-97/028	Location Description and Characterized Area Rationale
Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 1 (H-2) and ending with the southeastern most grid in Area I (O-4).																		
N-4	39	RSAN4	RSAN4-0.0	0.0													X	Boring located to evaluate former drum storage area in LOU 39 (Satellite Accumulation Point-AP Laboratory) and for general site coverage.
N-4	39		RSAN4-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
N-4	39		RSAN4-10	10	X	X	X	X		X	X	Hold	X	X				
N-4	39		RSAN4-20	20	X	X	X	X		X	X		X	X				
N-4	39		RSAN4-30	30	X	X	X	X		X	X		X	X				
N-4	39		RSAN4-40	40	X	X	X	X		X	X		X	X				
O-2	35	RSAO2	RSAO2-0.0	0.0													X	Boring located along western Site boundary to evaluate LOU 35 (former Truck Emptying/Dumping Site) and potential offsite VOC sources from the west. PCBs and TPH-GRO were detetcted in Phase A soil boring SA09.
O-2	35		RSAO2-0.5	0.5	X	X	X	X	X	X	X	X	X	X	X			
O-2	35		RSAO2-10	10	X	X	X	X	X	X	X	Hold	X	X				
O-2	35		RSAO2-20	20	X	X	X	X	X	X	X		X	X				
O-2	35		RSAO2-30	30	X	X	X	X	X	X	X		X	X				
O-2	35		RSAO2-40	40	X	X	X	X	X	X	X		X	X				
O-2	35	SA166	SA166-0.0	0.0													X	Boring located along west boundary of Site to evaluate LOU 35 (former Truck Emptying/Dumping Site), LOU 60 (Acid Drain System), and potential offsite VOC sources from the west. PCBs and TPH-GRO were detetcted in Phase A soil boring SA09.
O-2	35		SA166-0.5	0.5	X	X	X	X	X	X	X	X	X	X	X			
O-2	35		SA166-10	10	X	X	X	X	X	X	X	Hold	X	X				
O-2	35		SA166-20	20	X	X	X	X	X	X	X		X	X				
O-2	35		SA166-30	30	X	X	X	X	X	X	X		X	X				
O-2	35		SA166-40	40	X	X	X	X	X	X	X		X	X				
O-3	35	SA48	SA48-0.0	0.0													X	Boring located along western Site boundary to evaluate LOU 35 (former Truck Emptying/Dumping Site) and potential offsite VOC sources from the west. PCBs and TPH-GRO were detetcted in Phase A soil boring SA09.
O-3	35		SA48-0.5	0.5	X	X	X	X	X	X	X	X	X	X	X			
O-3	35		SA48-10	10	X	X	X	X	X	X	X	Hold	X	X				
O-3	35		SA48-20	20	X	X	X	X	X	X	X		X	X				
O-3	35		SA48-30	30	X	X	X	X	X	X	X		X	X				
O-3	35		SA48-37	37	X	X	X	X	X	X	X		X	X				
O-3	64	SA180	SA180-0.0	0.0													X	Boring located to evaluate soil stain in northern portion of LOU 64 (Koch Materials Asphalt Batch Plant).
O-3	64		SA180-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
O-3	64		SA180-10	10	X	X	X	X		X	X	Hold	X	X				
O-3	64		SA180-20	20	X	X	X	X		X	X		X	X				
O-3	64		SA180-30	30	X	X	X	X		X	X		X	X				
O-3	64		SA180-40	37	X	X	X	X		X	X		X	X				
O-3	64	SA181	SA181-0.0	0.0													X	Boring located to evaluate soil stain in northern portion of LOU 64 (Koch Materials Asphalt Batch Plant).
O-3	64		SA181-0.5	0.5	X	X	X	X		X	X		X	X	X			
O-3	64		SA181-10	10	X	X	X	X		X	X		X	X				
O-3	64		SA181-20	20	X	X	X	X		X	X		X	X				
O-3	64		SA181-30	30	X	X	X	X		X	X		X	X				
O-3	64		SA181-37	37	X	X	X	X		X	X		X	X				
O-3	64	RSAO3	RSA03-0.0	0.0													X	Boring located to evaluate soil stain in northern portion of LOU 64 (Koch Materials Asphalt Batch Plant) and to evaluate Acid Drain System (LOU 60) from offsite property to the west.
O-3	64		RSA03-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
O-3	64		RSA03-10	10	X	X	X	X		X	X	Hold	X	X				
O-3	64		RSA03-20	20	X	X	X	X		X	X		X	X				
O-3	64		RSA03-30	30	X	X	X	X		X	X		X	X				
O-3	64		RSA03-37	37	X	X	X	X		X	X		X	X				
O-3	60, 64	SA176	SA176-0.0	0.0													X	Boring located to evaluate Acid Drain System (LOU 60) pipeline.
O-3	60, 64		SA176-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
O-3	60, 64		SA176-10	10	X	X	X	X		X	X	Hold	X	X				
O-4	64	SA46	SA46-0.0	0.0													X	Boring located to evaluate LOU 64 (Koch Materials Asphalt Batch Plant) OCPs added to SA46 at the request of NDEP in comments to the Phase A report.
O-4	64		SA46-0.5	0.5	X	X	X	X		X	X		X	X	X			
O-4	64		SA46-10	10	X	X	X	X		X	X		X	X				
O-4	64		SA46-20	20	X	X	X	X		X	X		X	X				
O-4	64		SA46-30	30	X	X	X	X		X	X		X	X				
O-4	64		SA46-35	35	X	X	X	X		X	X		X	X				
O-4	64	SA47	SA47-0.0	0.0													X	Boring located to evaluate LOU 64 (Koch Materials Asphalt Batch Plant).
O-4	64		SA47-0.5	0.5	X	X	X	X		X	X		X	X	X			
O-4	64		SA47-10	10	X	X	X	X		X	X		X	X				
O-4	64		SA47-20	20	X	X	X	X		X	X		X	X				
O-4	64		SA47-30	30	X	X	X	X		X	X		X	X				
O-4	64		SA47-35	35	X	X	X	X		X	X		X	X				
O-4	64	SA55	SA55-0.0	0.0													X	Located as a downgradient boring to LOU 64 (Koch Materials Asphalt Batch Plant) and east step-out to and LOU 35 (former Truck Emptying/Dumping Site) to investigate for VOCs from potential offsite sources to the west and for general site coverage.
O-4	64		SA55-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
O-4	64		SA55-10	10	X	X	X	X		X	X	Hold	X	X				
O-4	64		SA55-20	20	X	X	X	X		X	X		X	X				
O-4	64		SA55-30	30	X	X	X	X		X	X		X	X				
O-4	64		SA55-35	35	X	X	X	X		X	X		X	X				

Table 2 (continued)
Soil Sampling and Analysis Plan
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Grid Location	LOU Number	Phase B Boring No.	Sample ID Number	Sample Depths (ft, bgs)	Perchlorate (EPA 314.0)	Metals (EPA 6020)	Hex Cr (EPA 7199)	TPH-DRO/ORO (EPA 8015B)	TPH-GRO (EPA 8015B)	VOCs [1.] (EPA 8260B)	Wet Chemistry [2.]	OCPs [3.] (8081A)	SVOCs [4.] (EPA 8270C)	Radio-nuclides [5.]	Dioxins/Furans [6.]	Formaldehyde Titrant (EPA 8315A)	Asbestos EPA/540/R-97/028	Location Description and Characterized Area Rationale
Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 1 (H-2) and ending with the southeastern most grid in Area I (O-4).																		
O-4	64	RSAO4	RSA04-0.0	0.0													X	Boring located to evaluate LOU 64 (Koch Materials Asphalt Batch Plant).
O-4	64		RSA04-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
O-4	64		RSA04-10	10	X	X	X	X		X	X	Hold	X	X				
O-4	64		RSA04-20	20	X	X	X	X		X	X		X	X				
O-4	64		RSA04-30	30	X	X	X	X		X	X		X	X				
O-4	64		RSA04-37	37	X	X	X	X		X	X		X	X				
O-4	64	SA182	SA182-0.0	0.0													X	Boring located to evaluate soil stain in northern portion of LOU 64 (Koch Materials Asphalt Batch Plant).
O-4	64		SA182-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
O-4	64		SA182-10	10	X	X	X	X		X	X	Hold	X	X				
O-4	64		SA182-20	20	X	X	X	X		X	X		X	X				
O-4	64		SA182-30	30	X	X	X	X		X	X		X	X				
O-4	64		SA182-37	37	X	X	X	X		X	X		X	X				
O-4	64	SA183	SA183-0.0	0.0													X	Boring located to evaluate soil stain in northern portion of LOU 64 (Koch Materials Asphalt Batch Plant).
O-4	64		SA183-0.5	0.5	X	X	X	X		X	X		X	X	X			
O-4	64		SA183-10	10	X	X	X	X		X	X		X	X				
O-4	64		SA183-20	20	X	X	X	X		X	X		X	X				
O-4	64		SA183-30	30	X	X	X	X		X	X		X	X				
O-4	64		SA183-37	37	X	X	X	X		X	X		X	X				
Number of Borings:		**63**																
SPLP Samples:																		
J-3	1, 32	RSAJ3	RSAJ3-10	10	X	X	X			X	X		X	X				
K-7	1, 22, 23, 32	RSAK7	RSAK7-10	10	X	X	X			X	X		X	X				
M-3	2	RSAM3	RSAM3-10	10	X	X	X			X	X		X	X				
K-6	1, 32	SA76	SA76-10	10	X	X	X			X	X		X	X				
O-2	35	SA166	SA166-30	30	X	X	X			X	X		X	X				
O-4	64	SA182	SA182-10	10	X	X	X			X	X		X	X				
Number of Samples:					**268**	**268**	**268**	**240**	**20**	**264**	**268**	**55**	**250**	**268**	**63**	**10**	**62**	
		QA/QC Samples:																
		Field Duplicates (10%)			27	27	27	24	2	27	27	6	25	27	7	1	7	
		Field Blanks			2	2	2	2	2	2	2	2	2	2	2	2	0	
		Equipment Rinsate Blanks			18	18	18	18	4	18	18	8	18	18	18	1	0	
		Trip Blank Samples			0	0	0	0	18	0	0	0	0	0	0	0	0	
		Matrix Spike (5%)			14	14	14	12	1	13	13	3	13	14	3	1	0	
		Matrix Spike Duplicate (5%)			14	14	14	12	1	13	13	3	13	14	3	1	0	
		Total Sample Count:			**343**	**343**	**343**	**308**	**48**	**337**	**341**	**77**	**321**	**343**	**96**	**16**	**69**	

Notes:

X	Sample will be collected and analyzed.
	No sample collected under Phase B sampling program.
TPH-DRO/ORO	Total petroleum hydrocarbons - Diesel-Range Organics/Oil-Range Organics.
1.	Samples for VOC analysis will be preserved in the field using sodium bisulfate (or DI water) and methanol preservatives per EPA Method 5035.
2.	Includes wet chemistry parameters listed on Table 1 of the Phase B Source Area Work Plan.
3.	Organochlorine Pesticides (includes analysis for hexachlorobenzene).
4.	Semi-volatile Organic Compounds
5.	Radionuclides consists of isotopic Uranium and Thorium, plus Radium-226/228 (per NDEP).
6.	Dioxins/furans: 90% will be tested by immunoassay, 10% analyzed by HRGC/HRMS in the laboratory.
7.	Polychlorinated biphenyls
SPLP	Synthetic Precipitate Leaching Procedure (EPA Method 1312)

Table 3
Groundwater Sampling and Analysis Plan
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Grid Location	Location Area	Monitoring Well No.	Screen Interval (ft bgs)	Well Sampled for Phase A? (y/n)	Perchlorate (EPA 314.0)	Hex Cr (EPA 7199)	Metals	VOCs[1] (EPA 8260)	Wet Chemistry[2]	OCPs[3] (EPA 8081A)	SVOCs[4] (EPA 8270C)	Radio-nuclides[5]	Rationale
Wells are organized by grid location as shown on Plate A - Starting point is on the northwestern-most grid in Area 1 (A-1) and ending with the southeastern-most grid covering Area I (O-4).													
A-3	1N	H-48	nr	no	X	X	X	X	X	X	X	X	Serves as a stepout, generally upgradient for LOU 67 (Delbert Madsen Site), for general site coverage and for BRC Parcel A.
A-5	1N	PC-40	15 - 55	yes	X	X	X	X	X	X	X	X	Located to evaluate LOU 67; as general site coverage; and to evaluate downgradient from Area I.
B-3	1N	H-49A	nr	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 67; as general site coverage; and to evaluate downgradient from Area I.
D-3	1N	MC-62	nr	no	X	X	X	X	X	X	X	X	Located for general site coverage and to evaluate downgradient from Area I
D-4	1N	PC-72	15 -35	no	X	X	X	X	X	X	X	X	Located to serve as a lateral stepout for M95; for general site coverage; and to evaluate downgradient from Area I.
E-1	1N	MC-45	nr	yes	X	X	X	X	X	X	X	X	Located to evaluate potential offsite sources to the west; for general site coverage downgradient from Area I.
E-3	1N	MC-65	nr	no	X	X	X	X	X	X	X	X	Located for general site coverage and to evaluate downgradient from Area I
E-3	1N	MC-66	nr	no	X	X	X	X	X	X	X	X	Located for general site coverage and to evaluate downgradient from Area I
E-5	1N	M-44	5 - 35	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 68 and as a lateral stepout for well M95 and to evaluate BRC Parcels B and I.
E-6	1N	M-94	12 - 22	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 68; BRC Parcels B and I and the downgradient area of the site.
E-6	1N	M-95	12 - 22	yes	X	X	X	X	X	X	X	X	Located to evaluate LOU 68; BRC Parcel B; and the downgradient area of the site.
E-7	1N	M-96	10.5 - 20.5	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 68; BRC Parcel B; and the downgradient area of the site.
F-2	1N	MC-53	20 - 40	no	X	X	X	X	X	X	X	X	Located to evaluate potential offsite sources to the west; for general site coverage downgradient from Area I.
F-4	1N	PC-37	16.8 - 41.8	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOU 68; to evaluate downgradient areas; and for general site coverage.
G-1	1N	MC-3	nr	no	X	X	X	X	X	X	X	X	Located offsite to the west to serve general site coverage; to evaluate potential offsite sources to the west; and to evaluate BRC Parcels C and E.
G-2	1N	MC-94	nr	no	X	X	X	X	X	X	X	X	Located to evaluate potential offsite sources to the west; for general site coverage; and to evaluate downgradient from Area I.
G-2	1N	MC-97	nr	no	X	X	X	X	X	X	X	X	Located to evaluate potential offsite sources to the west; for general site coverage; and to evaluate downgradient from Area I.
G-3	1N	MC-55	nr	no	X	X	X	X	X	X	X	X	Located to evaluate potential offsite sources to the west; for general site coverage downgradient from Area I.
H-2	1N	H-28A	nr	no	X	X	X	X	X	X	X	X	Serves as a close stepout downgradient for LOU 1and LOU 10, and general site coverage and to evaluate potential offsite sources to the west.
H-2	1N	MC-32	nr	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOU 10; to evaluate potential offsite sources to the west; to provide general site coverage; and to evaluate BRC Parcels C and E.
H-3	1	M-7B	25.5 - 50.5	yes	X	X	X	X	X	X	X	X	Located as a downgradient stepout for LOU 1and LOU 10; to evaluate possible offsite sources to the West; and for general site coverage.
H-3	1N	MC-59	nr	no	X	X	X	X	X	X	X	X	Located to evaluate potential offsite sources to the west; for general site coverage downgradient from Area I.
H-6	1N	M-23	9.4 - 37.4	no	X	X	X	X	X	X	X	X	Located to serve as a upgradient stepout for LOU 68; as a downgradient stepout for LOU 1; to evaluate BRC Parcels C and D; and for general site coverage.
H-8	1N	M-48	6.1 - 36.1	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 69 and to evaluate BRC Parcels B and J.
I-4	1	M-98	19 - 29	yes	X	X	X	X	X	X	X	X	Located to evaluate LOU 1 and for general site coverage.
I-5	1	M-99	16 - 31	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 1; as a downgradient stepout for LOUs 22, 23, and 32; as an upgradient stepout for LOU 69; and for general site coverage.
I-6	1	M-100	19 - 29	yes	X	X	X	X	X	X	X	X	Located to evaluate LOU 1; as a downgradient stepout for LOUs 22, 23, and 32; as an upgradient stepout for LOU 69; and for general site coverage.

Table 3 (continued)
Groundwater Sampling and Analysis Plan
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Grid Location	Location Area	Monitoring Well No.	Screen Interval (ft bgs)	Well Sampled for Phase A? (y/n)	Perchlorate (EPA 314.0)	Hex Cr (EPA 7199)	Metals	VOCs[1] (EPA 8260)	Wet Chemistry[2]	OCPs[3] (EPA 8081A)	SVOCs[4] (EPA 8270C)	Radio-nuclides[5]	Rationale
Wells are organized by grid location as shown on Plate A - Starting point is on the northwestern-most grid in Area 1 (A-1) and ending with the southeastern-most grid covering Area I (O-4).													
I-7	1	M-101	17 - 27	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 1; as a downgradient stepout for LOUs 22, 23, and 32; as an upgradient stepout for LOU 69; and for general site coverage.
J-2	1	AA-BW-02	33 - 53	no	X	X	X	X	X	X	X	X	Located to evaluate constituents from off-site sources to the west, and for general site coverage.
J-8	1	M-102	19.4 - 39.4	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 1; as a downgradient stepout for LOUs 22, 23, and 32; as an upgradient stepout for LOU 69; and for general site coverage.
K-2	1	M-5A	40 - 50	yes	X	X	X	X	X	X	X	X	Located to evaluate LOU 2 (Open Area South of the Trade Effluent Ponds); as an upgradient stepout for LOU 1 and LOU 10; to evaluate possible offsite sources to the West; and for general site coverage.
K-2	1	TR-2	144.5 - 174.5	no	X	X	X	X	X	X	X	X	To evaluate for SRCs in upper Muddy Creek Fm.
K-3	1	MW-16	25 - 40	no	X	X	X	X	X	X	X	X	New monitoring well to evaluate SRCs from in upper Muddy Creek from offsite sources from west.
K-5	1	M-69	19.9 - 39.3	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 32 and to evaluate the western end of the Groundwater Barrier Wall.
K-5	1	M-79	10.8 - 35.4	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 32 and the western end of the Groundwater Injection Trenches; and for general site coverage.
K-6	1	M-83	10.8 - 40.3	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 32 and the Groundwater Injection Trench area; as an upgradient stepout for LOU 1, LOUs 22 and 23; and for general site coverage.
K-6	1	M-84	11.8 - 34.1	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 32 and the Groundwater Injection Trench area; as an upgradient stepout for LOU 1 and LOUs 22 and 23; and for general site coverage.
K-8	1	M-88	7.3 - 36.8	no	X	X	X	X	X	X	X	X	Located to serve as an upgradient stepout for LOU 1; as a downgradient stepout for LOU 32; to evaluate possible offsite sources to the east; and for general site coverage.
K-9	1	CLD-1R	25 -35	no	X	X	X	X	X	X	X	X	Serves as a close stepout downgradient of LOU 5 (Beta Ditch) and general site coverage located on Timet.
L-2	1	M-127	TBD	new well	X	X	X	X	X	X	X	X	New monitoring well located to evaluate LOU 2; to evaluate potential offsite sources to the west; and for general site coverage.
L-3	1	M-126	19.7 - 39.7	no	X	X	X	X	X	X	X	X	New monitoring well located to serve as an up- to crossgradient stepout for LOU 2; to evaluate potential offsite sources from the west; and for general site coverage.
L-4	1	M-14A	20 - 40	no	X	X	X	X	X	X	X	X	Located as an upgradient stepout for LOUs 30, 56, and 58; as a downgradient well for LOU 39; and for general site coverage.
L-4	1	M-57A	20 - 40	no	X	X	X	X	X	X	X	X	Located to serve as an upgradient stepout for LOU 32; to evaluate the west end of the groundwater barrier wall; and for general site coverage.
L-5	1	I-B	17.8 - 42.5	no	X	X	X	X	X	X	X	X	Located as a downgradient stepout for LOU 56 and LOU 58; as an upgradient stepout for LOU 57, and for general site coverage.
L-6	1	M-55	14.6 - 44.6	yes	X	X	X	X	X	X	X	X	Located just upgradient of the groundwater barrier wall; to evaluate LOU 32; to serve as a downgradient stepout for LOUs 19, 31, and 55 and for general site coverage.
L-6	1	M-65	14.4 - 39	no	X	X	X	X	X	X	X	X	Located to serve as an upgradient stepout for LOU 32; as a downgradient stepout for LOU 57; and for general site coverage.
L-6	1	M-78	21.5 - 41.5	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 32; as a downgradient stepout for LOU 55 and for general site coverage.
L-8	1	M-61	93 - 38.8	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 32 and the eastern end of the Groundwater Barrier Wall.
L-8	1	M-67	7.8 - 37.8	no	X	X	X	X	X	X	X	X	Located to serve as an upgradient stepout for LOU32, and for general site coverage.
L-8	1	M-68	11.2 - 39.8	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOU 5 and 20; as an upgradient stepout for LOU 32; as an evaluation of the east end of the Groundwater Barrier Wall; and for general site coverage.
L-9	1	CLD-2R	22 - 42	no	X	X	X	X	X	X	X	X	Serves as a close stepout downgradient of LOU 5; and a further downgradient stepout for LOU 20 (Pond C-1 and Associated Piping), and for general site coverage.
L-10	1	CLD-3R	nr	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 67; as general site coverage; and to evaluate downgradient from Area I.
M-1	1	H-38	25 - 5	no	X	X	X	X	X	X	X	X	To evaluate possible offsite sources from the west, as an upgradient stepout to LOU 5 (Beta Ditch) and for general site coverage.
M-2	1	TR-4	124.5 - 144.5	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOU 5; to evaluate possible offsite sources to the west (particularly for VOCs); and for general site coverage.
M-3	1	M-125	TBD	new well	X	X	X	X	X	X	X	X	New monitoring well located to serve as a downgradient stepout for LOUs 5 and 54; to evaluate potential offsite sources from the west; and for general site coverage.

Table 3 (continued)
Groundwater Sampling and Analysis Plan
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Grid Location	Location Area	Monitoring Well No.	Screen Interval (ft bgs)	Well Sampled for Phase A? (y/n)	Perchlorate (EPA 314.0)	Hex Cr (EPA 7199)	Metals	VOCs[1] (EPA 8260)	Wet Chemistry[2]	OCPs[3] (EPA 8081A)	SVOCs[4] (EPA 8270C)	Radio-nuclides[5]	Rationale
Wells are organized by grid location as shown on Plate A - Starting point is on the northwestern-most grid in Area 1 (A-1) and ending with the southeastern-most grid covering Area I (O-4).													
M-8	1	M-39	24.9 - 39.9	yes	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOUs 5, 18, 20, and 21; and for general site coverage.
N-4	1	M-142	TBD	no	X	X	X	X	X	X	X	X	New monitoring well constructed in borehole for SA87 to evaluate LOU 39 (Satellite Accumulation Point, AP Maintenance Shop).
O-2	1	M-123	TBD	new well	X	X	X	X	X	X	X	X	New monitoring well located to evaluate LOU 35; as an upgradient stepout for LOUs 38 and 54; to evaluate potential offsite sources to the west; and for general site coverage.
O-4	1	M-124	TBD	new well	X	X	X	X	X	X	X	X	New monitoring well located to evaluate LOU 64; serve as a downgradient stepout for LOU 63; as an upgradient stepout for LOU 39; and for general site coverage.
O-4	1	M-128	TBD	new well	X	X	X	X	X	X	X	X	New monitoring well to serve as a downgradient stepout for LOUs 35 and 64; as an upgradient stepout for LOUs 39, 52, and 57; and for general site coverage.
				Number of Field Samples:	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	
QA/QC Samples:													
Field Duplicates (10%)					6	6	6	6	6	6	6	6	
Field Blanks					1	1	1	1	1	1	1	1	
Equipment Rinsate Blanks					14	14	14	14	14	14	14	14	
Trip Blank Samples					0	0	0	14	0	0	0	0	
Matrix Spike (5%)					3	3	3	3	3	3	3	3	
Matrix Spike Duplicate (5%)					3	3	3	3	3	3	3	3	
Total Samples:					**86**	**86**	**86**	**100**	**86**	**86**	**86**	**86**	

Notes:

X	Sample will be collected and analyzed.
1	Volatile organic compounds- samples for VOC analysis will be preserved in the field using sodium bisulfate(or DI water) and methanol preservatives per EPA method 5035
2	Includes wet chemistry parameters listed on Table 1 of the Phase B Source Area Work Plan.
3	Organochlorine pesticides(includes analysis for hexachlorobenzene).
4	Semi-volitile organic compounds
5	Radionuclides consists of isotopic Uranium and Thorium, plus Radium-226/228 (per NDEP).
1N	Well located outside (downgradient or cross-gradient) of Area 1.
TBD	To Be Determined when well is constructed.
nr	Not recorded in Tronox database (screen intervals to be acquired from BMI).

Table 4
Summary of LOU Closure Goals
Phase B Source Area Investigation Work Plan – Area I
Tronox Facility – Henderson, Nevada

LOU	Closure Goal
LOU 1	Closure for future commercial/industrial use except for active facilities (ponds, etc.) which will be closed later.
LOU 2	Closure for commercial/industrial future use.
LOU 10	Restricted closure maintaining landfill cap integrity and possible future non-invasive commercial/industrial uses such as a paved parking lot, which could further protect the landfill.
LOU 22	Continuation of current use – regulatory closure not presently requested.
LOU 23	Continuation of current use – regulatory closure not presently requested.
LOU 32	Continuation of current use – regulatory closure not presently requested.
LOU 35	Closure for future commercial/industrial use.
LOU 38	Continuation of current use – regulatory closure not presently required.
LOU 39	Continuation of current use – regulatory closure not presently required.
LOU 54	Closure for future commercial/industrial use.
LOU 58	Continuation of current use – regulatory closure not presently requested.
LOU 60	Closure for future commercial/industrial use.
LOU 64	Closure for future commercial/industrial use.

Table 5
Soil Borings Not Associated With An LOU But Included As Part of the Site-wide Investigation
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Soil Boring No.	Grid Location	Area
RSA L8	L-8	I
RSA M8	M-8	II
RSA N5	N-5	II
RSA N2	N-2	I
RSA O7	O-7	III
RSA O8	O-8	III
RSA P5	P-5	IV
RSA Q5	Q-5	II
RSA Q6	Q-6	II
RSA Q7	Q-7	III
RSA R7	R-7	III
RSA S4	S-4	IV
RSA S5	S-5	IV
RSA S6	S-6	IV
RSA S7	S-7	IV
RSA S8	S-8	III
RSA T8	T-8	IV
RSA T7	T-7	IV
RSA T6	T-6	IV
RSA T5	T-5	IV
RSA T4	T-4	IV
RSA U4	U-4	IV
RSA U5	U-5	IV
RSA U6	U-6	IV
RSA U7	U-7	IV

Table 6
Sample Containers, Analytical Methods, and Holding Times for Soil Samples
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Analyte	Method	Container (Minimum Volume)	Holding Time
Asbestos	EPA/540/R-97/028	I kilogram in plastic bag or glass jar, no preservative	6 months
Cyanide	EPA 9012A	4-oz. glass jar	None
Dioxins/Furans	EPA Method 8290	4-oz. glass jar	30 days
Formaldehyde	EPA Method 8315A	4-oz. glass jar	14 days
Fuel Alcohols (Methanol, Ethanol, Ethylene Glycol)	EPA 8015B	4-oz. glass jar	14 days
General Chemistry Anions/Cations	Prep method 1:10 Di leach / various analytical methods****	4-oz. glass jar	None (leachate holdtime per water methods)
Hexavalent Chromium	EPA 7199 by ion chromatography, EPA 3060A for digestion	4-oz. glass jar	28 days to digestion, then 4 days to analysis of digestate
Metals*	EPA 6010 / 6020	4-oz. glass jar	6 months
Organochlorinated Pesticides and PCBs	EPA Method 8081A and 8082	4-oz. glass jar	14 days
Organophosphorous Pesticides	EPA Method 8141	4-oz. glass jar	14 days
SVOCs	EPA Method 8270	4-oz. glass jar	14 days
Total Organic Carbon	Lloyd Kahn method	4-oz. glass jar	28 days
TPH***	EPA 8015B (EPA 5035 for GRO fraction)	(3) Methanol preserved VOA vials for GRO; glass jar for DRO/ORO.	14 days
VOCs	EPA 8260B/5035	4 40-mL VOA vials**	14 days
Radionuclides:			
Radium-226	EPA 9015	4-oz. poly jar, no preservative	6 months
Radium-228	EPA 9320	4-oz. poly jar, no preservative	6 months
Thorium (Isotopic)	EML HASL 300 Alpha Spec	4-oz. poly jar, no preservative	6 months
Uranium (Isotopic)	EML HASL 300 Alpha Spec	4-oz. poly jar, no preservative	6 months

Note:
* Includes the metals listed on Table 1.
For samples listing 4-oz. glass jar, one metal sleeve can be substituted.
** Three VOA vials preserved with DI water and one VOA vial preserved with methanol.
*** TPH includes GRO, DRO, and ORO.
**** See analytes in GW list (except TDS, TSS, TOC, cyanide, and conductance)

Table 7
Sample Containers, Analytical Methods, and Holding Times for Groundwater Samples
Phase B Source Area Investigation Work Plan - Area I
Tronox Facility - Henderson, Nevada

Analyte	Method	Container (Minimum Volume)	Holding Time
Perchlorate	EPA 314.0	(1) 125-ml plastic bottle	28 days
Formaldehyde	EPA 8315A	(1) 1-liter amber glass/ no preservative	3 days
Fuel alcohols	EPA 8015B	(1) 40-mL VOA vials	14 days
Hexavalent Chromium	EPA 218.6	(1) 250-ml plastic bottle w/buffer, field filtered	24 hours
Metals*	EPA 6010B / 6020	(1) 500-ml plastic bottle w/ HNO3	6 months
Organochlorinated Pesticides	EPA 8081A	(1) 1-liter amber glass/ no preservative	7 days
Organophosphorous Pesticides	EPA 8141	(1) 1-liter amber glass/ no preservative	7 days
Polychlorinated biphenyls	EPA 8082	(1) 1-liter amber glass/ no preservative	7 days
SVOCs	EPA 8270	(1) 1-liter amber glass/ no preservative	7 days
VOCs	EPA 8260B	(3) 40-ml VOA vials w/HCl	14 days
General Water Chemistry			
Alkalinity	SM 2320B	500-ml plastic no preservative	14 days
Ammonia	EPA 350.1	500-ml plastic w/H2SO4	28 days
Bromide	EPA 9056	125-ml plastic bottle/ no preservative	28 days
Chlorate	EPA 9056	125-ml plastic bottle/ no preservative	28 days
Chloride	EPA 9056	**(2) liter plastic bottles	28 days
Cyanide	EPA 9012A	(1) 500-ml plastic bottle w/ NaOH	14 days
Electrical Conductivity	EPA 9050	125-ml plastic no preservative	28 days
Nitrate	EPA 9056	**Use same bottles	48 hours
Nitrite	EPA 9056	125-ml plastic no preservative	48 hours
pH	EPA 9040	125-ml plastic no preservative	15 minutes
Phosphate	EPA 365.1	125-ml plastic bottle, no preservative	48 hours
Sulfate	EPA 9056	**Use same bottles	28 days
Surfactants (MBAS)	EPA 425.1	125-ml plastic no preservative	48 hours
TDS	EPA 160.1	125-ml plastic no preservative	28 days
Total Organic Carbon	EPA 9060	(2) 40-ml VOA vials w/H2SO4	28 days
TSS	EPA 160.2	125-ml plastic no preservative	7 days
Radionuclides:			
Radium-226	EPA 903.1	(1) 1-liter poly bottle (must be full), Preservative pH <2 HNO3	6 months
Radium-228	EPA 904.0	(1) 1-liter poly bottle (must be full), Preservative pH <2 HNO3	6 months
Thorium (Isotopic)	EML HASL 300 Alpha Spec	(1) 1-liter poly bottle (must be full), Preservative pH <2 HNO3	6 months
Uranium (Isotopic)	EML HASL 300 Alpha Spec	(1) 1-liter poly bottle (must be full), Preservative pH <2 HNO3	6 months

Note:
* Includes the metals listed on Table.
** Chloride, Nitrate, Nitrate, Bromide, and Sulfate use same bottle for all these samples. Sample containers are (2) liter plastic bottles.

FIGURES

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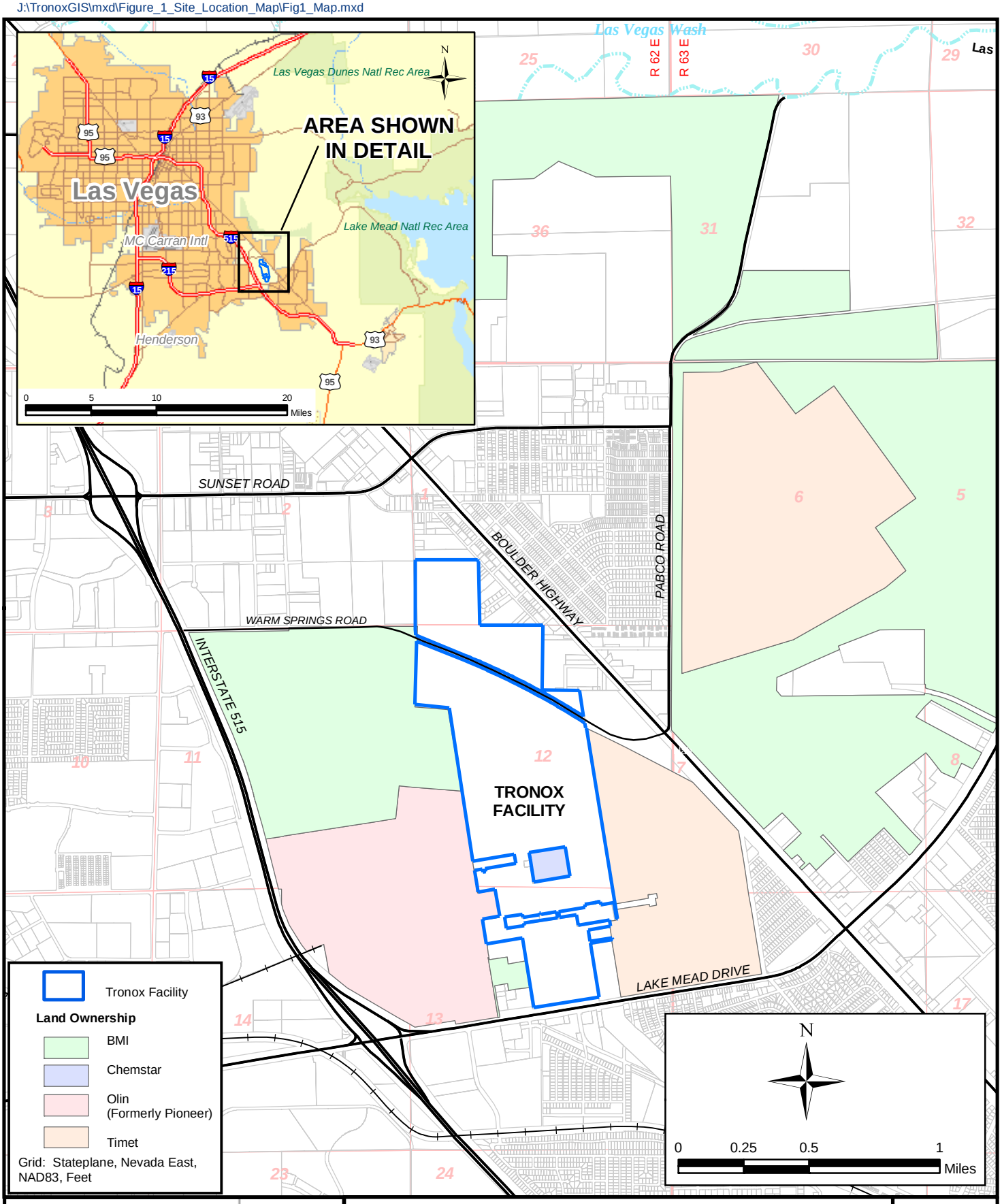

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SITE LOCATION MAP

AREA I WORKPLAN
PHASE B SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

FIGURE NUMBER:
1

DRAWN BY:	DATE:	PROJECT NUMBER:	SHEET NUMBER:
M. Scop	4/2/2008	04020-023	1 of 1

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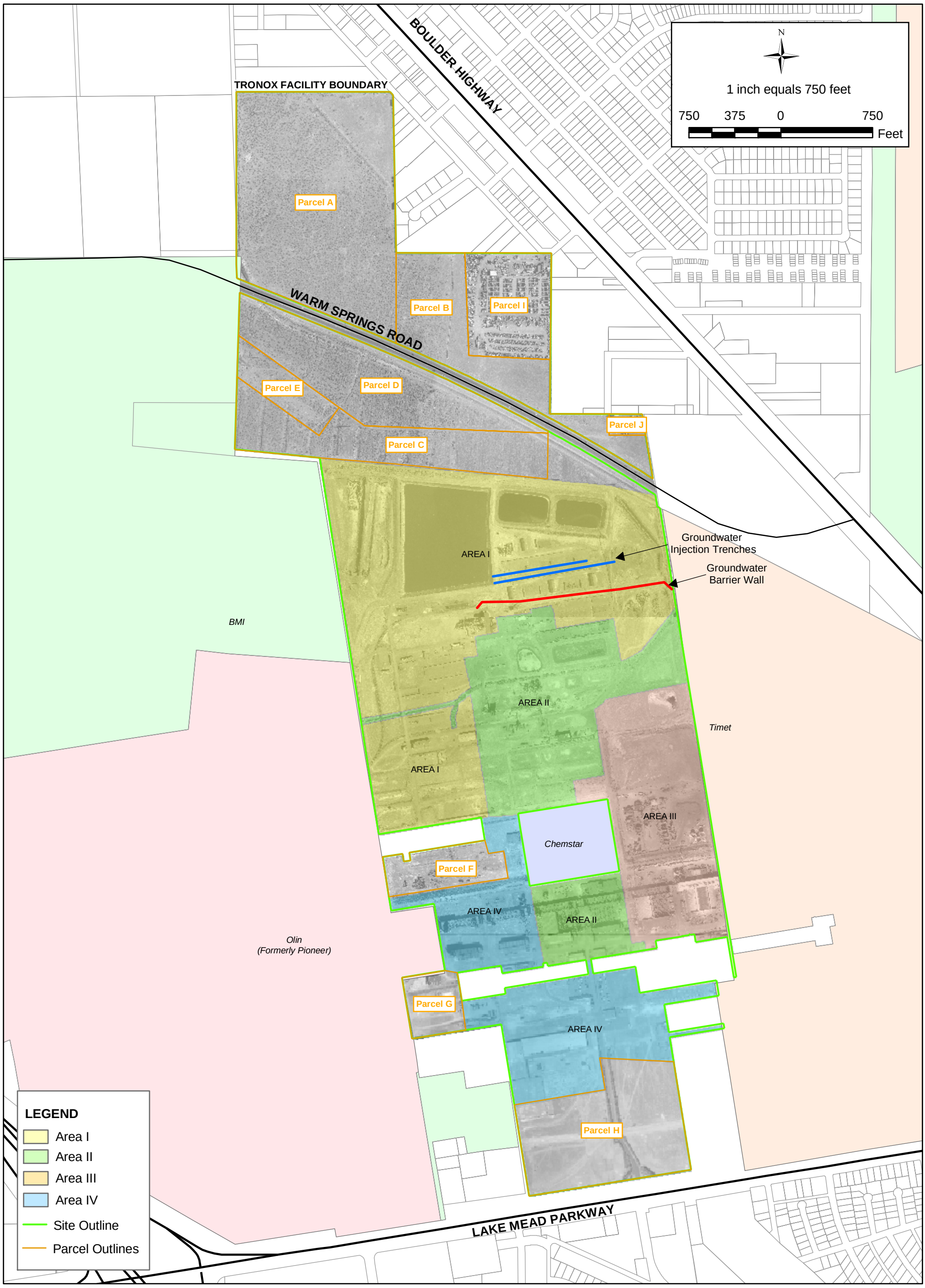

FIGURE NUMBER:	SHEET NUMBER:
2	X

PHASE B WORK PLAN SUB-AREAS
AREA I WORKPLAN
PHASE B SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
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DRAWN BY:				
T.M.				
CHECKED BY:				
B.H.				
APPROVED BY:				
M.F.				

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Parcel E

Parcel D

Parcel C

Parcel B

Parcel J

#69

BOULDER HIGHWAY

WARM SPRINGS ROAD

Area I LOUs

LOU Number	Name of LOU
1	Trade Effluent Settling Ponds
2	Open Area Due South of "Trade Effluent Disposal Ponds"
10	On-Site Hazardous Waste Landfill (Closed)
22	Pond WC-1 (WC-West) and Associated Piping
23	Pond WC-2 (WC-East) and Associate Piping
32	Ground Water Remediation Unit
35	Truck Emptying/Dumping Site
38	Former Satellite Accumulation Point, AP Laboratory
39	Satellite Accumulation Point-AP Maintenance Shop
54	AP Plant Area Change House/ Laboratory Septic Tank
58	AP Plant Area New Building D-1 Washdown
60	Acid Drain System
64	Koch Materials Company Site

LOU = Site identified in Letter of Understanding dated August 15, 1994.

See Plate A for additional LOU information.

AREA I

AREA II

AREA III

AREA IV

Groundwater Injection Trenches

Groundwater Barrier Wall

BMI

Timet

Olin (Formerly Pioneer)

Chemstar

U.S. Vanadium

Parcel F

#1 #2 #5 #10 #19 #20 #21 #22 #23 #24 #30 #31 #32 #34 #35 #37 #38 #39 #45 #46 #47 #48 #49 #50 #51 #52 #53 #54 #55 #56 #57 #58 #60 #63 #64 #65b #66 #7 #8 #9 #13 #14 #16&17 #18

LEGEND

- Tronox Site Outline
- Acid Drain System (LOU #60)
- Storm Drain System (LOU #59)

LOU Boundaries

- LOU Area
- LOU Area (Less Well Defined)

Phase B Workplan Areas

- AREA I
- AREA II
- AREA III
- AREA IV

N

400 200 0 400 Feet

REVISIONS: NO:	DESCRIPTION:	DATE:	BY:

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PHASE B AREA I LOUs
AREA I WORKPLAN
PHASE B SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	4/2/2008	04020-023-430

FIGURE NUMBER:

3

SHEET NUMBER:

X

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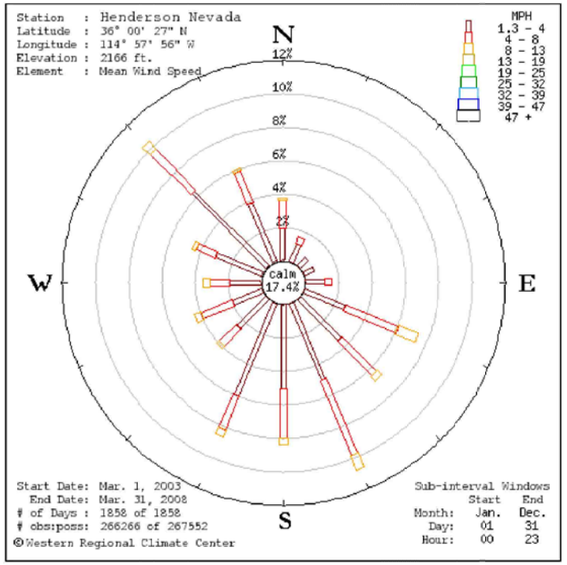
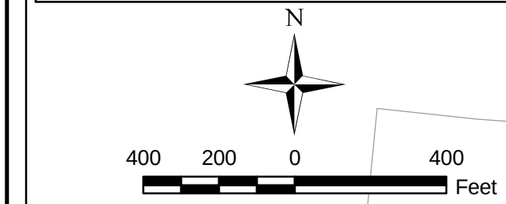
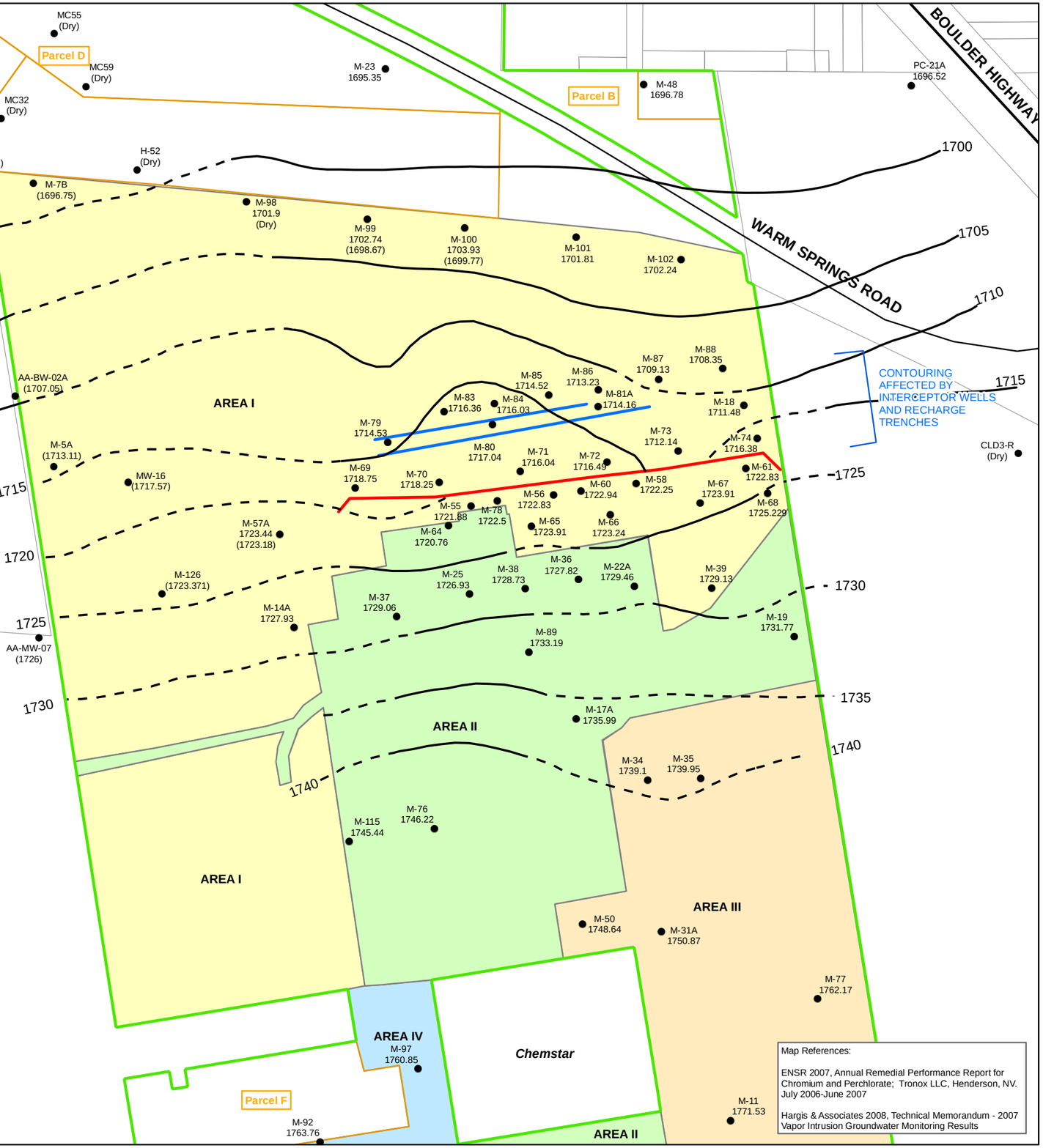
Henderson Nevada



Source: Community Environmental Monitoring Program - http://www.cemp.dri.edu/





Legend

- Groundwater Monitor Well
- 1745.44 — Water Level Elevation (feet above MSL) Measured April-May 2007 (ENSR, 2007)
- (1723.37) — Water Level Elevation (feet above MSL) Measured December 2007 (Hargis & Associates, 2008)
- Potentiometric Surface Constructed from water levels measured in April-May 2007. (Dashed where surface is located in the uppper Muddy Creek Formation fine-grained facies.)

Phase B Workplan Areas

- Area I
- Area II
- Area III
- Area IV

Map References:

ENSR 2007, Annual Remedial Performance Report for Chromium and Perchlorate; Tronox LLC, Henderson, NV. July 2006-June 2007

Hargis & Associates 2008, Technical Memorandum - 2007 Vapor Intrusion Groundwater Monitoring Results

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GROUNDWATER ELEVATION MAY 2007
AREA I WORKPLAN
PHASE B SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	5/2/2008	04020-023-430

FIGURE NUMBER:

4

SHEET NUMBER:

X

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N

1 inch equals 750 feet

750 375 0 750

Feet

BOULDER HIGHWAY

TRONOX FACILITY BOUNDARY

WARM SPRINGS ROAD

LAKE MEAD PARKWAY

Parcel A

Parcel B

Parcel I

Parcel D

Parcel E

Parcel C

Parcel J

Parcel F

Parcel G

Parcel H

AREA I

AREA II

AREA III

AREA IV

Groundwater Injection Trenches

Groundwater Barrier Wall

BMI

Olin (Formerly Pioneer)

Timet

Chemstar

H-48 PC-40 H-49A MC-62 MC-66 MC-65 PC-72 M-44 M-94 M-95 M-96 MC-45 MC-53 PC-37 MC-94 MC-55 MC-97 MC-3 MC-59 MC-32 M-23 M-48 H-28 M-7B M-98 M-99 M-100 M-101 M-102 M-88 M-83 M-84 M-79 M-5A MW-16 TR-2 M-69 M-55 M-78 M-61 CLD1R CLD2R CLD3R M-67 M-68 M-65 M-57A I-B M-64 M-39 M-127 M-126 M-14A I-AR M-25 M-38 M-22A M-19 M-110 M-89 M-111A M-17A TR-4 M-125 H-38 M-142 M-34 M-35 CLD4R M-2A M-75 M-76 M-128 M-123 CLU1 M-21 M-50 M-31A M-33 M-124 M-141 M-77 M-52 M-97 M-93 TR-6 M-92 M-11 M-122 MW-6R M-12A M-13 M-29 M-139 M-10 TR-8 M-137 M-138 TR-10 M-103 M-120 M-117 M-121 M-118 H-11

LEGEND

- Site Outline
- Parcel Outlines
- Groundwater Wells to be Sampled under Area I Workplan
- Groundwater Wells to be Constructed and Sampled under Area I Workplan
- Groundwater Wells to be Sampled under Area II, III & IV Workplans

SHEET NUMBER:	FIGURE NUMBER:
X	5

PHASE B WELL LOCATIONS
AREA I WORKPLAN
PHASE B SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
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CHECKED BY:				
B.H.				
APPROVED BY:				
M.F.				

Plate A – Phase B Sample Locations and LOUs for Area I

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LOU Number	Name of LOU	Grid
1	Trade Effluent Settling Ponds	Rows I-K
2	Open Area Due South of "Trade Effluent Disposal Ponds"	L3
3	Air Pollution Emissions Associated with Industrial Processes	-
4	Hardesty Chemical Company Site (prior to J. B. Kelley Operations)	Q4
5	On-Site Portion of Beta Ditch, Including "Small Diversion Ditch" Northwest of Pond C-1	M2-M8
6	Unnamed Drainage Ditch Segment (BMI Landfill)	Offsite
7	Old P-2 Pond and Associated Conveyance Facilities	O5
8	Old P-3 Pond and Associated Conveyance Facilities	O5
9	New P-2 Pond and Associated Piping	O6
10	On-Site Hazardous Waste Landfill (Closed)	I2
11	Sodium Chlorate Filter Cake Holding Area	Q6
12	Hazardous Waste Storage Area	R6
13	Pond S-1	Q6
14	Pond P-1 and Associated Conveyance Piping	O6
15	Platinum Drying Unit	Q6
16 & 17	Ponds AP-1, AP-2, and AP-3 and Associated Transfer Lines	M6
18	Pond AP-4	M7
19	Pond AP-5	M5, M6
20	Pond C-1 and Associated Piping	M8
21	Pond Mn-1 and Associated Piping	N8
22	Pond WC-1 (WC-West) and Associated Piping	J6
23	Pond WC-2 (WC-East) and Associate Piping	J7
24	Leach Beds, Associated Conveyance Facilities, and Mn Tailings Area	O7, O8
25	Process Hardware Storage Area	R4
26	Trash Storage Area	Q3
27	PCB Storage Area	R4
28	Hazardous Waste Storage Area	R3
29	Solid Waste Dumpsters	S6
30	AP Area-Pad 35	L5
31	Drum Recycling Area	L5
32	Ground Water Remediation Unit	Rows I-L
33	Sodium Perchlorate Platinum By-Product Filter, Unit 5	R7
34	Former Manganese Tailings Area	Q8
35	Truck Emptying/Dumping Site	O2, O3
36	Former Satellite Accumulation Point, Unit 3, Maintenance Shop	R5
37	Former Satellite Accumulation Point, Unit 6, Maintenance Shop	R8
38	Former Satellite Accumulation Point, AP-Laboratory	N3
39	Satellite Accumulation Point-AP Maintenance Shop	N4
40	PCB Transformer Spill	R7
41	Unit 1 Tenant Stains	Q3
42	Unit 2 Salt Redler	R5
43	Unit 4 and 5 Basements	R6
44	Unit 6 Basement	R8
45	Diesel Storage Tank	O6
46	Former Old Main Cooling Tower and Recirculation Lines	O7, O8
47	Leach Plant Area Manganese Ore Piles	P8
48	Leach Plant Analyte Tanks	P7
49	Leach Plant Area Sulfuric Acid Storage Tanks	P7
50	Leach Plant Area Leach Tanks	P7
51	Leach Plant Area Transfer Lines	P8
52	AP Plant Area Screening Building, Dryer Building and Associated Sump	M5
53	AP Plant Area Tank Farm	N6
54	AP Plant Area Change House/ Laboratory Septic Tank	N3
55	Area Affected by July 1990 Fire	L6
56	AP Plant Area Old Building D-1- Washdown	L5
57	AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SI's and Transfer Lines	M5
58	AP Plant Area New Building D-1 Washdown	M5
59	Storm Sewer System	Rows N-R
60	Acid Drain System	Rows K-R
61	Old Sodium Chlorate Plant Decommissioning	R6
62	State Industries, Inc. Site, Including Impoundments and Catch Basin	U4, U5
63	J. B. Kelley, Inc. Trucking Site	P3
64	Koch Materials Company Site	O3, O4
65	Nevada Precast Concrete Products, Green Ventures International, Buckles Construction Company and Ebony Construction Sites	P4, Q3, R3, S3
66	Above-Ground Diesel Storage Tank Leased by Flintkote Co.	Q5
67	Delbert Madsen and Estate of Delbert Madsen Site	B4
68	Southern Nevada Auto Parts Site (Pick A Part)	F6
69	Dillon Potter Site	H7
NA	Former U.S. Vanadium Site	P8, Q8
LOU = Site identified in Letter of Understanding dated August 15, 1994.		

Sample locations in areas II, III and IV are not finalized and subject to change.

Groundwater Injection Trenches

Groundwater Barrier Wall

Pipeline Associated with Ponds WC-West and WC-East (LOU 22 & 23)

Acid Drain System (LOU 60)

Storm Sewer System (LOU 59)

N

1:2,400

1 inch equals 200 feet

200 100 0 200

Feet

LEGEND

- Tronox Facility Boundary
- Area I Boundary
- LOU Boundary in Area I, dashed are less defined
- LOU Boundary in other areas, dashed are less defined
- Groundwater Monitoring Well Location
- Proposed Phase B Boring Location
- Proposed Phase B Soil Gas Location
- Phase A Boring Location (Sept. 2007)
- Phase II BRC Sample Location (Oct. 2007)
- Historic Sample Location (pre 2006)
- Storm Drain
- Acid Drain
- Four Acre Grid Line (Cell reference displayed row-column)

Grid: Stateplane, Nevada East, NAD83, Feet
Base Aerial Photo from PBS&J, October 2006

SHEET NUMBER: 1 of 1

FIGURE NUMBER: A

PHASE B SAMPLE LOCATIONS AND LOUs FOR AREA I

PHASE B SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	4/2/2008	04020-023-430

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CHECKED BY: C. Schnell				
APPROVED BY: B. Ho				

TRONOX