

Tronox Facility – Henderson, Nevada

Name of Facility: LOU 44 – Unit 6 Basement

LOU 37 - Former Satellite Accumulation Point - Unit 6

Maintenance Shop

Goal of Closure:

• Continuation of current use producing manganese dioxide.

Regulatory closure is not presently requested.

Site Investigation Area: LOU 44 – Unit 6 Basement

Size: Approximately 200 feet by 250 feet (1.4 acres)

 Location: Southeastern portion of the Site along the eastern boundary, in the Unit 6 building.

• Current Status/Features: Unit 6 is currently active in the manufacturing of manganese dioxide.

LOU 37 – Former Satellite Accumulation Point – Unit 6 Maintenance Shop

Size: Approximately 10 feet by 10 feet.

• Location: Northeastern portion of the Unit 6 building.

 Current Status/Features: This area currently contains a non-solvent-based parts washer.

Description: LOU 44 – Unit 6 Basement

Basement

 Since 1951, a high-purity, battery-active manganese dioxide has been produced in electrolytic cells on the first floor of Unit 6 [Ref. 4].

- From August 1942 to November 1944, Unit 6 was used to produce magnesium metal [Ref. 4].
- The basement beneath the electrolytic cells collects process spillage from overhead manganese sulfate process tanks [Ref. 4].
- The manganese dioxide electrolytic cells are covered with paraffin to reduce evaporation [Ref. 3].
- Releases from the overhead cells to the basement are returned to the cells [Ref. 4].
- By the mid-1980s, the Unit 6 basement floor had deteriorated and numerous releases were noted [Ref. 4].
- The basement has been identified as a source of soil and groundwater impact [Ref. 4].
- In 1986, the basement was cleaned, the concrete floor was removed, and sub-surface soil was re-contoured [Ref. 4].
- Concrete debris from the basement was disposed of in the Mn Tailings Area (LOU 24) [Ref. 4].



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- In December 1987, the concrete floor was lined with a 100-mil HDPE liner [Ref. 4].
- The liner is periodically checked and serviced [Ref. 4].

Manganese Dioxide Plating Process

- High concentration manganese liquor is pumped to Unit 6 where purified manganese dioxide is plated out of solution onto electrodes [Ref. 3].
- Purified manganese dioxide is removed from the electrodes and washed to remove residual manganese sulfate and sulfuric acid [Ref. 5].
- The washing takes place near the center of the northern portion of the Unit 6 building on the third and fourth floors [Ref. 5].
- Beginning in May 1989, the purified manganese dioxide wash waste (product thickener overflow) was diverted to the WC-East pond through aboveground and overhead pipelines. Currently (as of January 2008), the wash water is pumped to the WC-East pond [Ref. 5].
- Purified manganese dioxide is ground to a uniform size and placed in supersacks for sale [Ref. 3].

LOU 37 – Former Satellite Accumulation Point - Unit 6 Maintenance Shop

- The former Satellite Accumulation Point (LOU 37) included a parts washer and a drum for temporary storage of the parts washer waste (sludge) [Ref. 4].
- From 1989 to 1991, the parts cleaner used a closed circulation solvent-based (1,1,1-trichloroethane [1,1,1-TCA]) parts washer for cleaning oil and grease from valves, fittings, and other items. From 1991 to an unknown date, the parts cleaner fluid was switched to a caustic-based detergent [Ref. 4]. Currently (as of January 2008) a non-solvent-based cleaning solution, maintained by Safety-Kleen, is used [Ref. 5].
- Waste stored in the area from 1989 to 1991 included an oily sludge containing oil, grease, and 1,1,1-TCA (considered hazardous). Wastes stored in the area from 1991 to an unknown date included oil, grease and caustic detergent (non-hazardous but regulated) [Ref. 4].
- Observation of LOU 37 conducted in February 1992 indicated that the concrete floor was not cracked [Ref. 4].



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Process Waste Streams Associated With LOU 44	Known or Potential Constituents Associated with LOU 44
Electrolytes and releases from overhead	Metals (manganese)
manganese sulfate process tanks into the basement [Ref. 4].	Wet chemistry analytes
Cathode wash waste [Ref. 4].	Sodium hexametaphosphate
	Metals (magnesium, manganese from cathode scale, and manganese dioxide)
	Wet chemistry analytes
Purified manganese dioxide wash water [Ref. 4].	Metals (manganese)
	Wet chemistry analytes
Process Waste Streams Associated With LOU 37	Known or Potential Constituents Associated with LOU 44
VOCs from parts washer [Ref. 4].	• VOCs (1,1,1-TCA)
Solvent releases from parts washer [Ref. 4].	• 1,1,1-TCA • TPH
Caustic releases from parts washer [Ref. 5].	Caustic detergent (non-hazardous)
Waste sludge releases from storage drum [Ref. 4].	Metals Tour
	TPH1,1,1-TCA

Overlapping or Adjacent LOUs:

The following LOUs overlap or are adjacent to LOU 44 and LOU 37:

Overlapping LOUs

- LOU 60 (Acid Drain System) Overlaps the northern portion of LOU 44.
- LOU 37 (Former Satellite Accumulation Point Unit 6
 Maintenance Shop) Overlaps the northeastern portion of LOU 44.

Adjacent LOUs

• LOU 33 (Sodium Perchlorate Platinum By-Product Filter, Unit 5) – Located west (cross-gradient) of LOU 44.



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- LOU 43 (Unit 5 Basement) Located west (cross-gradient) of LOU 44.
- LOU 59 (Storm Sewer System) Located west and east (cross-gradient) of LOU 44.
- LOU 60 (Acid Drain System) Located west and east (cross-gradient) and north (downgradient) of LOU 44.
- Timet Located off-site to the east (cross-gradient) of LOUs 44 and 37.

Known or potential chemical classes associated with adjacent or overlapping LOUs are consistent with those listed for LOUs 44 and 37; therefore, no additional chemical classes have been added to the Phase B Analytical Plan for LOU 44 and LOU 37.

LOUs 44 and 37 are located at the initiation point of the segment of the Acid Drain System (LOU 60) in Area III; therefore, wastes from other portions of LOU 60 would not affect LOUs 44 and 37. For detailed information on these LOUs, please refer to the specific LOU data package.

Other LOUs Potentially Affecting Soils in LOUs 44 and 37:

<u>Timet:</u> Data provided by the NDEP indicates that a
uranium plume on the Timet property may potentially be
affecting LOUs 44 and 37. Known or potential chemical
classes associated with the uranium plume are consistent
with those listed for LOUs 44 and 37; therefore, no
additional chemical classes have been added to the
Phase B Analytical Plan for LOUs 44 and 37.

Known or Potential Release Mechanisms:

LOU 44 - Unit 6 Basement

- Potential infiltration to subsurface soils and groundwater.
- Prior to 1986, chemicals were known to have been released to the underlying soil and groundwater via cracks in the concrete basement. Releases caused soil heaving that further damaged the floor [Ref. 4].
- No releases documented in the current system.

LOU 37 – Former Satellite Accumulation Point - Unit 6 Maintenance Shop

- Potential infiltration to subsurface soils and groundwater.
- No releases documented in the reports reviewed.



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Known Potential Chemical Classes:

- Metals
- Wet chemistry analytes
- VOCs
- SVOCs
- TPH

Results of Historical Sampling:

LOU 44 - Unit 6 Basement

- No known soil sampling was conducted prior to the 1986 concrete floor repairs at Unit 6 (LOU 44). Records of confirmation sampling after the removal of the concrete floor were not found in the documents reviewed.
- Upgradient monitoring well M-10, and well M-29 (located in LOU 44) have been tested for total chromium, hexavalent chromium, perchlorate, manganese, pH, chlorate, nitrates, and total dissolved solids as part of periodic or routine groundwater monitoring programs [Ref. 2].

The analytical results are summarized in LOUs 44 and 37 Tables 6 and 7 (see attached).

LOU 37 – Former Satellite Accumulation Point - Unit 6 Maintenance Shop

 No known historical soil or groundwater sampling was identified in the documents reviewed.

Did Historical Samples Address Potential Release?

No

Summary of Phase A SAI:

Soil

 The closest soil boring (SA08) is located approximately 125 feet north (downgradient) of LOUs 44 and 37 and was specifically sampled to evaluate these LOUs [Ref. 1].

Groundwater

 The closest groundwater sample (GWSA08) was collected from Phase A boring SA08 located approximately 125 feet north (downgradient) of LOUs 44 and 37 and was specifically sampled to evaluate these LOUs [Ref. 1].



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Chemical classes detected in Phase A soil boring SA08:

- Metals
- Perchlorate
- Wet chemistry analytes
- VOCs
- SVOCs
- TPH-DRO/ORO
- Dioxins/furans
- Radionuclides
- Asbestos

As a result of the Phase A data, the Phase B analytical plan for samples collected from LOUs 44 and 37 will be expanded to include analyses for perchlorate, dioxins/furans, radionuclides, and asbestos.

 Analytical results for soil and groundwater from the Phase A sampling event are summarized in LOUs 44 and 37 Tables 1 through 5 and LOUs 44 and 37 Tables 8 through 23 [Ref. 1] (see attached).

Are Phase A Sample Locations in "Worst Case" Areas?

No

Is Phase B Investigation Recommended?

Yes

Proposed Phase B Soil Investigation/Rationale:

No direct investigations are proposed at LOUs 44 and 37 since the processes in Unit 6 are currently active and drilling would breach the containment. Full direct assessment is proposed when Unit 6 is removed from service in the future.

- The Phase B Source Area Investigation for LOU 44 and LOU 37 will consist of collecting soil samples from three (3) locations.
 - One (1) soil boring (RSAR8) will be drilled south (upgradient) of LOUs 44 and 37.
 - One (1) soil boring (SA177) will be drilled north (downgradient) of LOUs 44 and 37.
 - One (1) soil boring (SA34) will be drilled west (cross-gradient) of LOUs 44 and 37.
 - All three borings along with the analytical program to evaluate soil samples from LOUs 44 and 37 are listed on Table A – Soil Sampling and Analytical Plan for LOUs 44 and 37.
- Soil sample locations consist of both judgmental and randomly-placed locations.



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- Judgmental sample locations:
 - Designed to evaluate soil for known or potential chemical classes associated with LOUs 44 and 37, based on the known process waste streams.
 - Two (2) of the three sample locations are judgmental locations and include soil borings SA177 and SA34.
- Random sample grid locations:
 - Designed to assess whether unknown constituents associated with LOUs 44and 37 are present.
 - One (1) of the three sample locations is randomlyplaced (RSAR8).

Proposed Phase B Constituents List for Soils:

Both Judgmental and Random sample locations will be analyzed for the following constituents:

- Metals (Phase A list)
- Hexavalent chromium
- Perchlorate
- Wet chemistry analytes
- VOCs
- SVOCs
- TPH DRO/ORO
- Organochlorine pesticides
- Dioxins/furans
- Radionuclides
- Asbestos

Proposed Phase B Groundwater Investigation/Rationale:

No direct assessment through the active LOU is proposed in order to avoid compromising the liner in the Unit 6 basement; however, well M-29 located in the center of the basement of Unit 6 will be sampled as part of this investigation

- One (1) well (M-29) located in the basement of Unit 6 will be sampled.
- One (1) well (M-139) located south (upgradient) of LOUs 44 and 37 will be sampled.
- Three (3) wells (M-122, M-144, and MW-6R) located north and northeast (downgradient) of LOUs 44 and 37 will be sampled.
- The analytical program to evaluate groundwater samples associated with LOUs 44 and 37 is listed on Table B – Groundwater Sampling and Analytical Plan for LOU 44 and 37.



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Proposed Phase B Constituents List for Groundwater:

Groundwater samples will be analyzed for the following analytes:

- Metals (Phase A list)
- Hexavalent chromium
- Perchlorate
- Wet chemistry analytes
- VOCs
- SVOCs
- Organochlorine pesticides
- Radionuclides

Proposed phase B Soil Gas Investigation/Rationale:

Soil gas samples will be collected from two locations to evaluate area-wide conditions for the presence of vapor-phase VOCs in the vadose zone.

- SG38 will be located southwest of LOUs 44 and 37 to provide areal coverage of VOCs from a groundwater source and to assess vapor intrusion for the Unit 6 building.
- SG37 will be located north of LOUs 44 and 37 to investigate the Acid Drain System as a potential VOC source and to assess the vapor risk to the nearby Unit 6 building.

Details of the soil gas sampling program are contained in the NDEP-approved (March 26, 2008) Soil Gas Survey Work Plan, Tronox LLC, Henderson, Nevada, dated March 20, 2008.

Proposed Phase B Constituents List for Soil Gas: References:

- VOCs (EPA TO-15)
- ENSR, 2007a, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. ENSR, 2007c, Quarterly Performance Report for Remediation Systems, Tronox LLC, Henderson, Nevada, July-September 200, November 2007.
- 3. Environmental Answers, Keith Bailey, Verbal Communication, April 23, 2008.
- 4. Kleinfelder, 1993, Environmental Conditions Assessment, Kerr-McGee Chemical Corporation, Henderson, Nevada Facility, April 15, 1993 (Final).
- 5. Tronox Susan Crowley, Verbal Communication, January 15, 2008.



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LOU Figure

- UNIT 6 MAINTENANCE SHOP Phase B Area III Source Area Investigation Tronox Facility Henderson Nevada

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Sampling and Analytical Plans for LOUs 44 and 37:

Table A – Soil Sampling and Analytical Plan for LOUs 44 and 37 Table B – Groundwater Sampling and Analytical Plan for LOUs 44 and 37

Grid Location	LOU Number	Phase B Boring No.	Sample ID Number	Sample Depths ^{1.} (ft. bgs)	Perchlorate (EPA 314.0)	Metals (EPA 6020)	Hex Cr (EPA 7199)	TPH- DRO/ORO (EPA 8015B)	TPH-GRO (EPA 8015B)	VOCs ^{2.} (EPA 8260B)	Wet Chemistry ^{3.}	Total Cyanide (EPA 9012A)	OCPs ^{4.} (EPA 8081A)	SVOCs ^{5.} (EPA 8270C)	Radio- nuclides ^{6.}	Dioxins/ Furans ^{7.}	PCBs ^{8.} (EPA 8082 and 1668A)	Asbestos ^{9.} EPA/540/R- 97/028	Geo- technical Tests ^{10.}	Rationale
	Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 3 (N-7) and ending with the southeastern most grid in Area 3 (S-8).																			
Q-8															Boring located to evaluate LOU 37 (Former Satellite Accumulation Point for Unit-6),					
Q-8	34E, 37, 44, 60		SA177-0.5	0.5	X	Х	Х			Χ	Χ		Х	Χ	X	Х				LOU 44 (Unit-6 Basement), and LOU 60 (Acid Drain System). Located at a close but accessible
Q-8	34E, 37, 44, 60		SA177-10	10	X	Х	X			Χ	Χ		Hold	Χ	Х					location to evaluate releases from LOUs 37 and 44, and adjacent to LOU 60 piping at worst
Q-8	34E, 37, 44, 60		SA177-20	20	X	Х	X			Χ	Χ		Hold	Χ	Х					case location for releases at a junction.
Q-8	34E, 37, 44, 60		SA177-30	30	X	Х	X			Χ	Χ		Hold	Χ	Х					Drain System).
Q-8	34E, 37, 44, 60		SA177-40	40	X	Χ	X			Χ	X		X	Χ	X					
R-8	44	RSAR8	RSAR8-0.0	0.0														X		Boring located south of Unit-6 to evaluate LOU 44 (Unit-6 Basement) and
R-8	44		RSAR8-0.5	0.5	X	X	X	X		Χ	Χ		X	Χ	X	X				as part of site-wide coverage for potential historical chemical use. Located as close as
R-8	44		RSAR8-10	10	X	X	X	X		Χ	Χ		Hold	Χ	X					possible outside to LOU 44 near potential release point and for area wide coverage.
R-8	44		RSAR8-20	20	X	X	Х	X		Χ	Χ		Hold	Χ	X					
R-8	44		RSAR8-30	30	Х	X	Χ	X		Χ	Χ		Hold	Χ	X					
R-8	44		RSAR8-40	40	X	X	Х	X		Χ	Χ		X	Χ	X					
R-8	33, 44, 61, 59	SA34	SA34-0.0	0.0														X		Boring located to evaluate LOU 33 (Former Sodium Perchlorate Platinum By-Product Filter), LOU
R-8	33, 44, 61, 59		SA34-0.5	0.5	X	X	Χ	X		Χ	Χ		X		X	X				44 (Unit-6 Basement), LOU 59 (Storm Sewer System), and LOU 61 (Old Sodium Chlorate Plant
R-8	33, 44, 61, 59		SA34-10	10	X	X	Χ	X		Χ	Χ		Hold		X					Decommissioning and Unit-5 Basement). Located in between LOUs 44,33 and 61 to evaluate all
R-8	33, 44, 61, 59		SA34-20	20	X	X	Χ	X		Χ	Χ		Hold		X					three LOUs and adjacent to LOU 59 to evaluate pipeline releases.
R-8	33, 44, 61, 59		SA34-30	30	X	X	Χ	X		Χ	Χ		Hold		Χ					
R-8	33, 44, 61, 59		SA34-40	40	X	X	Х	X		Χ	Χ		X		X					
Νι	umber of Borings:	3																		
Nu	imber of Samples:				15	15	15	10	0	15	15	0	6	10	15	3	0	3	1	

Notes:

- n/a Not applicable - boring is not associated with a specific LOU but is located to evaluate soil for general area-wide coverage.
- Sample will be collected and analyzed. Χ
- No sample collected under Phase B sampling program.
- Sample depth to be determined in the field where DD = sample depth (ft).

PH-DRO/ORO Total petroleum hydrocarbons - Diesel-Range Organics/Oil-Range Organics.

- The 0.5 ft bgs sample will be collected from the 0.0 to 0.5 ft bgs interval, unless the area is paved, samples will be collected at 0.5 feet below or from a representative depth beneath the pavement. Alternately, if an unpaved area is within a reasonable distance, the sample will be moved to the unpaved area.
- Samples for VOC analysis will be preserved in the field using sodium bisulfate (or DI water) and methanol preservatives per EPA Method 5035.
- Consists of wet chemistry parameters (including pH) listed on Table 1 of the Phase B Source Area Work Plan.
- Organochlorine Pesticides (includes analysis for hexachlorobenzene).
- Semi-volatile Organic Compounds
- Radionuclides consists of alpha spec reporting for isotopic Thorium and isotopic Uranium, and Radium-226, plus Radium-228 by beta counting (per NDEP).
- Dioxins/furans will be analyzed by EPA Method 8290 for all samples. Screening reports will be provided for 90% of the samples and full data packages for 10% of the samples.
- Polychlorinated biphenyls Samples locations will be analyzed by USEPA methods 8082 and 1668A. Concrete srufaces at these locations will also include chip and/or wipe samples per EPA Region 1 SOP for Sampling Concrete in the Field (1997). Soil samples for asbestos analyses will be collected from a depth of 0 to 2-inches bgs.
- Geotechnical Tests consist of: moisture content (ASTM D-2216), grain size analysis (ASTM D-422 and C117-04), Soil Dry Bulk Density (ASTM D-854, Soil-Water Filled Porosity (ASTM D-2216); Vertical Hydraulic Conductivity (ASTM D-5084/USEPA 9100).

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Table B

Groundwater Sampling and Analysis Plan for LOUs 37 and 44
Phase B Source Area Investigation Area III Work Plan

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Grid Location	Location Area	Monitoring Well No.	Screen Interval (ft bgs)	Soil Type Expected Across Screen Interval ^{1.}	Well Sampled for Phase A? (y/n)	Perchlorate (EPA 314.0)	Hex Cr (EPA 7199)	Metals	VOCs ^{2.} (EPA 8260)	Wet Chemistry (a)	OCPs ^{3.} (EPA 8081A)	SVOCs ^{4.} (EPA 8270C)	Radio-nuclides ^{5.}	Rationale
		Wells	are organized b	by grid location	as shown o	n Plate A - S	Starting poi	nt is on th	e northwes	tern-most	grid in Ar	ea III (N-7	') and ending	with the southeastern-most grid covering Area III (Q-9).
Q-8	III	M-122	TBD	TBD	new well	Х	Х	Х	х	Х	Х	Х	X	New monitoring well located to serve as a downgradient step out for LOUs 37, 44, and 60; as an upgradient step out for LOUs 34E, 47, 48, 51, 59 and Area 70 (former U.S. Vanadium); to evaluate possible offsite sources to the east; and for general Site coverage.
Q-9	IIIE	MW-6R	nr	nr	no	Х	x	X	Х	Х	Х	Х	. X	Located to serve as a downgradient step out for LOUs 37and 44; as a crossgradient step out for LOUs 59 and 60; to evaluate possible offsite sources to the east; and for general Site coverage.
R-8	III	M-29	22-42	MCfg1	no	Х	Х	X	Х	Х	Х	Х	X	Located to evaluate groundwater conditions beneath the Unit 6 building for LOUs 44 and 37.
R-8	III	M-139	TBD	TBD	new well	Х	Х	Х	Х	Х	Х	Х	Х	Located as an upgradient step out for LOUs 37 and 44, and general site coverage.
R-8	III	M-145	TBD	TBD	new well	Х	Х	Χ	Х	Х	X	Х	X	New monitoring well located to serve as a crossgradient step out for LOU 44, to evaluate possible offsite sources to the east; and for general Site coverage.
				Number of	Field Samples:	5	5	5	5	5	5	5	5	

Notes:

- X Sample will be collected and analyzed.
- It is anticipated that the large majority of the flow to the well will be from the coarse-grained sediments. As such, in the cases where there are two lithologies present across the screen interval, the water sampled will represent conditions in the coarse-grained interval.
- 2 VOCs = Volatile organic compounds (to include analysis for naphthalene).
- 3 OCPs = Organochlorine pesticides (to include analysis for hexachlorobenzene).
- 4 SVOCs = Semi volatile organic compounds.
- 5 Radionuclides consists of alpha spec reporting for isotopic Thorium and isotopic Uranium, and Radium-226, plus Radium-228 by beta counting (per NDEP).
- (a) Complete list of wet chemistry parameters are shown on Table 1. All groundwater samples will have pH measured in the field.

IIIN/E/W/S Well located outside (north, east, west, or south) of Area III.

TBD To be determined when well is constructed.

nr Not recorded in the All Wells Database (June 2008).

Qal Quaternary Alluvium

MCfg1 Muddy Creek Formation - first fine-grained facies

MCcg1 Muddy Creek Formation - first coarse-grained facies

MCfg2 Muddy Creek Formation - second fine-grained facies

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Soil and Groundwater Characterization Data



Tronox Facility - Henderson, Nevada

LOU-specific analytes identified include:

- Wet chemistry analytes
- Dioxins/furans
- Metals
- Organochlorine pesticides
- Perchlorate
- Radionuclides
- SVOCs
- TPH
- VOCs
- Asbestos

The tables in **BOLD** below present historical data associated with these LOU-specific analytes.

LOUs 44 and 37 Table 1 - Soil Characterization Data - Wet Chemistry

LOUs 44 and 37 Table 2 - Groundwater Characterization Data - Wet Chemistry

LOUs 44 and 37 Table 3 - Soil Characterization Data - Dioxins and Dibenzofurans

LOUs 44 and 37 Table 4 - Soil Characterization Data - Metals

LOUs 44 and 37 Table 5 - Groundwater Characterization Data - Metals

LOUs 44 and 37 Table 6 - Groundwater Characterization Data - Routine Monitoring

LOUs 44 and 37 Table 7 - Groundwater Characterization Data - Routine Monitoring

LOUs 44 and 37 Table 8 - Soil Characterization Data - Organochlorine Pesticides (OCPs)

LOUs 44 and 37 Table 9 - Groundwater Characterization Data - Organochlorine Pesticides (OCPs)

LOUs 44 and 37 Table 10 - Soil Characterization Data - Organophosphorus Pesticides (OPPs)

LOUs 44 and 37 Table 11 - Groundwater Characterization Data - Organophosphorus Pesticides (OPPs)

LOUs 44 and 37 Table 12 - Soil Characterization Data - PCBs

LOUs 44 and 37 Table 13 - Groundwater Characterization Data - PCBs

LOUs 44 and 37 Table 14 - Soil Characterization Data - Perchlorate

LOUs 44 and 37 Table 15 - Groundwater Characterization Data - Perchlorate

LOUs 44 and 37 Table 16 - Soil Characterization Data - Radionuclides

LOUs 44 and 37 Table 17 - Groundwater Characterization Data - Radionuclides

LOUs 44 and 37 Table 18 - Soil Characterization Data - SVOCs

LOUs 44 and 37 Table 19 - Groundwater Characterization Data - SVOCs

LOUs 44 and 37 Table 20 - Soil Characteristic Data - TPH and Fuel Alcohols

LOUs 44 and 37 Table 21 - Soil Characterization Data - VOCs

LOUs 44 and 37 Table 22 - Groundwater Characteristic Data - VOCs

LOUs 44 and 37 Table 23 - Soil Characterization Data - Long Asbestos Fibers in Respirable Soil Fraction

Notes for All Phase A Data Tables are Presented at the End of the Tables.

LOUs 44 and 37 Table 1 Soil Characterization Data - Wet Chemistry

Unit 6 Building Tronox Facility - Henderson, Nevada

	_	1	DI 4	DI 4	DI 4	DI 4	
•	g Program		Ph A	Ph A	Ph A	Ph A	
Į į	Boring No.	SA8	SA8	SA8	SA8	SA8	
	Sample ID	SA8-0.5	SA8-10	SA8-20	SA8-30	SA8-37	
Sample	Depth (ft)	0.5	10	20	30	37	
Sa	11/17/2006	11/17/2006	11/17/2006	11/17/2006	11/17/2006		
Wat Chamiatus Baramatar	MSSL ²						Units
Wet Chemistry Parameter	mg/kg						Units
Percent moisture		4.8	6.3	4.7	8.4	26.6	percent
Alkalinity (as CaCO3)		134	53.4 U	52.4 U	279	68.1 U	mg/kg
Bicarbonate		358	247	293	1050	157	mg/kg
Total Alkalinity		492	281	333	1330	157	mg/kg
Ammonia (as N)		5.3 UJ	5.3 UJ	5.2 UJ	5.5 UJ	6.8 UJ	mg/kg
Cyanide	1.37E+04	R	R	R	R	R	mg/kg
MBAS		5.9	4.2 U	4.4 U	4.3 U	5.6 U	mg/kg
pH (solid)		8.4	8.2	8.5	8.9	7.7	none
Bromide		2.6 U	2.7 U	2.6 U	2.7 U	1.5 J	mg/kg
Chlorate		16.7 J-	1.9 J-	3.2 J-	4.8 J-	16.8 J-	mg/kg
Chloride		495 J+	62.3 J+	345 J+	84.5 J+	395 J+	mg/kg
Nitrate (as N)		2.6 J+	1.7 J+	4.4 J+	8.2 J+	14.9	mg/kg
Nitrite		4.7 J-	2.1 UJ	4.0 J-	2.2 UJ	2.7 UJ	mg/kg
ortho-Phosphate		2.4 J	5.3 U	5.2 U	5.5 U	6.8 U	mg/kg
Sulfate		177	696	181	193	15100	mg/kg
Total Organic Carbon		3480 J-	1220 J-	3150 J-	6400 J-	12900 J-	mg/kg

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial Outdoor Worker (March, 2008).

LOUs 44 and 37 Table 2 Groundwater Characterization Data - Wet Chemistry

Unit 6 Building Tronox Facility - Henderson, Nevada

Samn	ling Program	Ph A ¹				
- Camp	Well ID	SA8				
	Sample ID					
	Sample Date					
	MCL ²					
Wet Chemistry Parameters	ug/L		Units			
Total Dissolved Solids	5.00E+02 j	6180 J-	mg/L			
Total Suspended Solids		449 J-	mg/L			
Alkalinity (as CaCO3)		5.0 U	mg/L			
Bicarbonate		268	mg/L			
Total Alkalinity						
Ammonia (as N)		79.9	ug/L			
MBAS		0.20 U	mg/L			
Cyanide	2.00E-01	5.0 UJ	ug/L			
pH (liquid)			none			
Specific Conductance		6420 J	umhos/cm			
Bromide		14.1 J-	mg/L			
Chlorate		15.0	mg/L			
Chloride	2.50E+02	229 J-	mg/L			
Nitrate (as N)	1.00E+01	9.5	mg/L			
Nitrite	1.00E+00	2.0 U	mg/L			
ortho-Phosphate		5.0 U	mg/L			
Sulfate	2.50E+02 j	5330	mg/L			
Total Organic Carbon		2.2	mg/L			

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility Henderson, Nevada, September 2007.
- 2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
- (j) Secondary Drinking Water Regulation value.

LOUs 44 and 37 Table 3 Soil Characterization Data - Dioxins and Dibenzofurans

Unit 6 Building Tronox Facility - Henderson, Nevada

Sam	pling Program	Ph A ¹	
	Boring No.	SA8	
	Sample ID	SA8-0.5	
Sai	mple Depth (ft)	0.5	
- Cui	Sample Date	11/17/2006	
	MSSL ²	11/11/2000	
Chemical Name	ng/kg		Units
Dioxin 8290 SCREEN Total TEQ-ENSR	ng/kg		
Calculated (a) ng/kg		0.014	ng/kg
Dioxin SW 846 8290 Total TEQ-ENSR			
Calculated (a) ng/kg			ng/kg
Dioxin 8290 SCREEN Total TEQ-ENSR			
Calculated (b) ng/kg		0.063	ng/kg
Dioxin SW 846 8290 Total TEQ-ENSR			
Calculated (b) ng/kg			ng/kg
1,2,3,4,6,7,8-Heptachlorodibenzofuran		0.479	ng/kg
1,2,3,4,6,7,8-Heptachlorodibenzofuran			ng/kg
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin		0.714	ng/kg
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin			ng/kg
1,2,3,4,7,8,9-Heptachlorodibenzofuran		0.075 U	ng/kg
1,2,3,4,7,8,9-Heptachlorodibenzofuran			ng/kg
1,2,3,4,7,8-Hexachlorodibenzofuran		0.034 U	ng/kg
1,2,3,4,7,8-Hexachlorodibenzofuran			ng/kg
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin		0.043 U	ng/kg
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin			ng/kg
1,2,3,6,7,8-Hexachlorodibenzofuran		0.030 U	ng/kg
1,2,3,6,7,8-Hexachlorodibenzofuran			ng/kg
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin		0.036 U	ng/kg
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin			ng/kg
1,2,3,7,8,9-Hexachlorodibenzofuran		0.041 U	ng/kg
1,2,3,7,8,9-Hexachlorodibenzofuran			ng/kg
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin		0.040 U	ng/kg
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin			ng/kg
1,2,3,7,8-Pentachlorodibenzofuran		0.023 U	ng/kg
1,2,3,7,8-Pentachlorodibenzofuran			ng/kg
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin		0.030 U	ng/kg
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin			ng/kg
2,3,4,6,7,8-Hexachlorodibenzofuran		0.034 U	ng/kg
2,3,4,6,7,8-Hexachlorodibenzofuran			ng/kg
2,3,4,7,8-Pentachlorodibenzofuran		0.022 U	ng/kg
2,3,4,7,8-Pentachlorodibenzofuran			ng/kg
2,3,7,8-Tetrachlorodibenzofuran		0.043 U	ng/kg
2,3,7,8-Tetrachlorodibenzofuran			ng/kg
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	1.00E+03 h,v	0.028 U	ng/kg
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	1.00E+03 h,v		ng/kg
Octachlorodibenzofuran		1.403	ng/kg
Octachlorodibenzofuran			ng/kg
Octachlorodibenzo-p-Dioxin		6.973	ng/kg

LOUs 44 and 37 Table 3 (continued) Soil Characterization Data - Dioxins and Dibenzofurans

Unit 6 Building Tronox Facility - Henderson, Nevada

Sar	mpling Program	Ph A ¹				
	Boring No.					
	Sample ID	SA8-0.5				
Sa	ample Depth (ft)	0.5				
	Sample Date	11/17/2006				
Chemical Name		Units				
Chemical Name	ng/kg		Offics			
Octachlorodibenzo-p-Dioxin			ng/kg			
Tetrachlorinated Dibenzofurans, (Total)			ng/kg			
Total HpCDD			ng/kg			
Total HpCDF			ng/kg			
Total HxCDD			ng/kg			
Total HxCDF			ng/kg			
Total PeCDD		ng/kg				
Total PeCDF			ng/kg			
Total TCDD			ng/kg			

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility Henderson, Nevada, September 2007.
- 2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial Outdoor Worker (March, 2008).
- (a) Calculated assuming 0 for non-detected congeners and 2006 toxic equivalency factors (TEFs).
- (b) Calculated assuming 1/2 detection limit as proxy for non-detected congeners and 2006 TEFs.
- (h) Dioxins and furans were expressed as 2,3,7,8- TCDD TEQ (toxic equivalents), calculated using the TEFs published by Van den Berg et al., 2006.
- (v) USEPA. 1998. Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites. OSWER Directive 9200.4-26. April, 1998. A value of 1000 ng/kg is applicable to residential soils. The range of 5000 to 20000 ng/kg is applicable to commercial/industrial soils. The Agency for Toxic Substances and Disease Registry (ATSDR) provides a screening level of 50 ng/kg for dioxin in residential soil [http://www.atsdr.cdc.gov/substances/dioxin/policy/].

LOUs 44 and 37 Table 4 Soil Characterization Data - Metals

Unit 6 Building Tronox Facility - Henderson, Nevada

5	Sampling Program	Ph A ¹	Ph A	Ph A	Ph A	Ph A	
	Boring No.	SA8	SA8	SA8	SA8	SA8	
	Sample ID	SA8-0.5	SA8-10	SA8-20	SA8-30	SA8-37	
	Sample Depth (ft)	0.5	10	20	30	37	
	Sample Date	11/17/2006	11/17/2006	11/17/2006	11/17/2006	11/17/2006	
Matala	MSSL ²						11
Metals	mg/kg						Units
Aluminum	1.00E+05	6450	6650	6270	6930	8070	mg/kg
Antimony	4.50E+02	0.15 J-	0.24 J-	0.13 J-	0.18 J-	0.20 J-	mg/kg
Arsenic	2.80E+02	1.8	2.5	3.4	3.7	44.3	mg/kg
Barium	1.00E+05	143 J+	165 J	161 J	168 J	81.9 J	mg/kg
Beryllium	2.20E+03	0.40 J-	0.46 J-	0.42 J-	0.45 J-	0.47 J-	mg/kg
Boron	1.00E+05	2.5 J-	3.5 J-	6.5 J-	5.6 J-	28.3 J-	mg/kg
Cadmium	5.60E+02	0.085	0.087	0.090	0.065	0.058 J	mg/kg
Calcium		9930 J+	10500 J+	28800 J+	22800 J+	79600 J+	mg/kg
Chromium (Total)	7.10E+01	10.1 J-	11.2 J-	9.3 J-	11.7 J-	40.9 J-	mg/kg
Chromium-hexavalent	5.00E+02	0.21 U	0.21 U	0.21 U	0.22 U	0.27 U	mg/kg
Cobalt	2.10E+03	7.0 J-	6.4 J-	7.6 J-	5.1 J-	3.5 J-	mg/kg
Copper	4.20E+04	12.4 J-	13.5 J	15.6 J	11.7 J	11.7 J	mg/kg
Iron	1.00E+05	14000	13600	12900	13300	7600	mg/kg
Lead	8.00E+02	7.6	8.4	6.9	7.8	4.4	mg/kg
Magnesium		6390 J-	5350 J-	7920 J-	7520 J-	51900 J-	mg/kg
Manganese	3.50E+04	316 J	349 J	289 J	214 J	111 J	mg/kg
Molybdenum	5.70E+03	0.55	0.54	0.47 J	0.56	0.51 J	mg/kg
Nickel	2.30E+04	12.4 J-	12.7 J	18.7 J-	11.5 J-	12.4 J-	mg/kg
Platinum		0.016 J	0.013 J	0.014 J	0.015 J	0.014 U	mg/kg
Potassium		1380 J-	2390 J-	1120 J-	1350 J-	2390 J-	mg/kg
Selenium	5.70E+03	0.11 UJ	0.12 UJ	0.11 UJ	0.12 UJ	0.15 UJ	mg/kg
Silver	5.70E+03	0.12 J	0.12 J	0.12 J	0.12 J	0.10 J	mg/kg
Sodium		689 J-	1410 J-	591 J-	586 J-	1540 J-	mg/kg
Strontium	1.00E+05	119 J+	141 J	201 J	206 J	542 J	mg/kg
Thallium		0.087 U	0.14 U	0.080 U	0.076 U	0.16 U	mg/kg
Tin		1.2	0.99	0.55	0.60	0.39	mg/kg
Titanium		583	654	627	577 J	431	mg/kg
Tungsten		0.37 UJ	0.36 UJ	0.28 UJ	0.25 UJ	0.41 UJ	mg/kg
Uranium		0.75	0.93	1.3	2.0	10.2	mg/kg
Vanadium	5.70E+03	43.1 J-	44.5 J-	41.9 J-	39.5 J-	40.3 J-	mg/kg
Zinc	1.00E+05	25.5 J-	26.9 J-	23.8 J-	25.0 J-	19.2 J-	mg/kg
Mercury	3.41E+02 (t)	0.011 J-	0.0073 J-	0.007 UJ	0.010 J-	0.0091 UJ	mg/kg

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial Outdoor Worker (March, 2008).
- (t) Value for mercury and compounds.

LOUs 44 and 37 Table 5 Groundwater Characterization Data - Metals

Unit 6 Building Tronox Facility - Henderson, Nevada

Sa	mpling Program	Ph A ¹	
	Well ID:	SA08	
	Sample ID	M-29 ²	
	Sample Date	11/17/2006	
Metals	MCL ³		Unit
Alexandra and	ug/L	7011	/1
Aluminum	5.00E+01 j	7.9 U	ug/L
Antimony	6.00E+00	0.94 J	ug/L
Arsenic	1.00E+01	100	ug/L
Barium	2.00E+03	17.2	ug/L
Beryllium	4.00E+00	0.088 UJ	ug/L
Boron	7.30E+03	2670	ug/L
Cadmium	5.00E+00	0.078 J	ug/L
Calcium		395000	ug/L
Chromium (Total)	1.00E+02	24.7 J-	ug/L
Chromium-hexavalent	1.09E+02	25.8 J	ug/L
Cobalt	7.30E+02	5.1 J-	ug/L
Copper	1.30E+03 p	11.1 J-	ug/L
Iron	3.00E+02 j	94 U	ug/L
Lead	1.50E+01 u	0.49 U	ug/L
Magnesium	1.50E+05 a	619000	ug/L
Manganese	5.00E+01 j	108 J-	ug/L
Molybdenum	1.82E+02	23.9	ug/L
Nickel	7.30E+02	16.8 J-	ug/L
Platinum		0.1 U	ug/L
Potassium		15900 J-	ug/L
Selenium	5.00E+01	5.4 J	ug/L
Silver	1.00E+02 j	0.2 U	ug/L
Sodium		525000	ug/L
Strontium	2.19E+04	10400	ug/L
Thallium	2.00E+00	0.32 U	ug/L
Tin	2.19E+04	0.2 U	ug/L
Titanium	1.46E+05	6.5 J-	ug/L
Tungsten		5 U	ug/L
Uranium	3.00E+01	241	ug/L
Vanadium	3.65E+01	50.7 J-	ug/L
Zinc	5.00E+03 j	16.8 J-	ug/L
Mercury	2.00E+00	0.093 UJ	ug/L

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. Denotes groundwater grab sample from open borehole (filtered in the field to remove suspended particulates >0.45 um).
- 3. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
- (j) Secondary Drinking Water Regulation value.
- (p) The national primary drinking water regulations (b) lists a treatment technology action level of 1.3 mg/l as the MCL for Copper. Therefore, the secondary value is not used.
- (u) See footnote (b). Treatment technology action level.
- (a) NAC 445A.455 Secondary standards. Certain provisions of the National Primary Drinking Water Regulations are adopted by reference (NAC 445A.4525). These values are listed in the first column of this table and are therefore not listed again here. Only NAC 445A.455 Secondary standards are listed.

LOUs 44 and 37 Table 6 Groundwater Characterization Data - Routine Monitoring¹

Unit 6 Building Tronox Facility - Henderson, Nevada

Well ID	Date	Depth to water (ft)	Perchlorate mg/L	Qual	MCL ² mg/L	Total Chromium mg/L	Qual	MCL ² mg/L	TDS mg/L	Qual	MCL ² mg/L	Nitrate (as N) mg/L		MCL ² mg/L	Chlorate mg/L	Qual	MCL ² mg/L
M-29	5/3/2007	34.77	1.88		1.80E-02 a,m	0.041	d	1.00E-01	4970		5.00E+02 j	4.33	d	1.00E+01	3.01	d	
M-10	1/31/2006	48.03			1.80E-02 a,m	0.9	d	1.00E-01			5.00E+02 j			1.00E+01			
M-10	1/31/2006	48.03	23	d	1.80E-02 a,m	0.89	d	1.00E-01	3180		5.00E+02 j	1.8	d	1.00E+01			
M-10	5/2/2006	49.76	22	d	1.80E-02 a,m	1	d	1.00E-01	2660		5.00E+02 j	<0.1	ud	1.00E+01	195	d	
M-10	8/2/2006	50.01			1.80E-02 a,m	1.1	d	1.00E-01			5.00E+02 j	<0.1	ud	1.00E+01			
M-10	8/2/2006	50.01	23.8	d	1.80E-02 a,m	1.1	d	1.00E-01	2510		5.00E+02 j	1	d	1.00E+01	420	d	
M-10	10/31/2006	49.31			1.80E-02 a,m	0.91	d	1.00E-01			5.00E+02 j	<0.1	ud	1.00E+01			
M-10	10/31/2006	49.31	29.4	d	1.80E-02 a,m	0.86	d	1.00E-01	3160		5.00E+02 j	2.61	d	1.00E+01	252	d	
M-10	1/31/2007	49.22	32		1.80E-02 a,m	0.61		1.00E-01	3190		5.00E+02 j	2.8	d	1.00E+01			
M-10	5/1/2007	49.63	25.6		1.80E-02 a,m	0.71		1.00E-01	3160		5.00E+02 j	3.2		1.00E+01	220		
M-10	8/2/2007	49.47	30.1		1.80E-02 a,m	0.96		1.00E-01	3260		5.00E+02 j	3.6		1.00E+01			

Notes:

- 1. ENSR, 2007, Quarterly Performance Report for Remediation Systems, Tronox LLC, Henderson, Nevada, July-September 2007, November 2007.
- 2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
- (a) NAC 445A.455 Secondary standards. Certain provisions of the National Primary Drinking Water Regulations are adopted by reference (NAC 445A.4525). These values are listed in the first column of this table and are therefore not listed again here. Only NAC 445A.455 Secondary standards are listed.
- (m) Equal to the provisional action level derived by NDEP as referenced in "Defining a Perchlorate Drinking Water Standard". NDEP Bureau of Corrective Action. URL [http://ndep.nv.gov/bca/perchlorate02_05.htm].
- (j) Secondary Drinking Water Regulation value.
- < = less than the reporting limit
 Blank cell or --- = no data and or no qualifier
 Qual = data qualifiers applied by laboratory or during data validation
 TDS = Total Dissolved Solids
 mg/l = milligram per liter

Laboratory Qualifiers:

d = the sample was diluted

ud = the sample was dilluted and was not detected above the sample reporting limit

LOUs 44 and 37 Table 7 Groundwater Characterization Data - Routine Monitoring¹

Unit 6 Building Tronox Facility - Henderson, Nevada

Well ID	Sample Date	Total Depth (ft bgs)	Depth to Water (ft TOC)	pH (Lab)	EC (Lab, µmho/cm)	Cr ₊₆ (ppm)	Cr- total (ppm)	Mn (ppm)	CIO ₄ (ppm)
M-10	5/6/99	67.99	49.92	7.13	4210		1.50	0.27	54
M-10	5/5/00	67.99	48.50	7.36	4630		0.28	0.32	15
M-10	5/1/02	67.99	47.88	6.9	3840		0.022	0.48	2
M-10	12/10/02	67.99	48.79	7.5	4330		0.12	1.20	11
M-10	11/4/03	67.99	48.28	7.0	4180		0.52	390	18
M-10	8/4/04	67.99		7.6	3980	0.016	0.078	640	16
M-29	5/6/99	41.02	33.88	6.29	6630		0.15	760	<10
M-29	5/5/00	41.02	34.14	6.41	6610		0.09	570	0.420
M-29	5/1/02	41.02	33.90	6.5	5350		0.18	440	0.150

Notes:

1. ENSR, 2007, Quarterly Performance Report for Remediation Systems, Tronox LLC, Henderson, Nevada, July-September 2007, November 2007.

ft bgs = feet below ground surface EC = Electrical Conductivity ppm = parts per million Cr-total: Total Chromium

 μ mho/cm = micromhos per centimeter Mn = Manganese ft TOC = feet from Top of Casing CIO₄: Perchlorate

ND<0.15 = Not determined, not detected above the designated detection limit.

--- = Either no data was obtained or was not analyzed for the respective constituent.

LOUs 44 and 37 Table 8 Soil Characterization Data - Organochlorine Pesticides (OCPs)

Unit 6 Building Tronox Facility - Henderson, Nevada

	Sampling Program	Ph A ¹	
	Boring No.	SA8	
	Sample ID	SA8-0.5	
	Sample Depth (ft)	0.5	
	11/17/2006		
	Sample Date MSSL ²	11,11,2000	
Organochlorine Pesticides	mg/kg		Unit
4,4'-DDD	1.10E+01	0.018 U	mg/kg
4,4'-DDE	7.80E+00	0.018 U	mg/kg
4,4'-DDT	7.80E+00	0.018 U	mg/kg
Aldrin	1.10E-01	0.018 U	mg/kg
Alpha-BHC	4.00E-01	0.018 U	mg/kg
Alpha-chlordane	1.40E+00 (y)	0.018 U	mg/kg
Beta-BHC	1.40E+00	0.018 U	mg/kg
Delta-BHC		0.018 U	mg/kg
Dieldrin	1.20E-01	0.018 U	mg/kg
Endosulfan I	4.10E+03 (aa)	0.018 U	mg/kg
Endosulfan II	4.10E+03 (aa)	0.018 U	mg/kg
Endosulfan Sulfate	4.10E+03 (aa)	0.018 U	mg/kg
Endrin	2.10E+02	0.018 U	mg/kg
Endrin Aldehyde	2.10E+02 (k)	0.018 U	mg/kg
Endrin Ketone	2.10E+02 (k)	0.018 U	mg/kg
Gamma-BHC (Lindane)	1.90E+00	0.018 U	mg/kg
Gamma-Chlordane	1.40E+00 (y)	0.018 U	mg/kg
Heptachlor	4.30E-01	0.018 U	mg/kg
Heptachlor Epoxide	2.10E-01	0.018 U	mg/kg
Methoxychlor	3.40E+03	0.035 U	mg/kg
Tech-Chlordane	1.40E+00	0.11 U	mg/kg
Toxaphene	1.70E+00	0.53 U	mg/kg

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial Outdoor Worker (March, 2008).
- (y) Value for chlordane (technical) used as surrogate for alpha-chlordane and gamma-chlordane based on structural similarities.
- (aa) Value for endosulfan used as surrogate for endosulfan I, endosulfan II and endosulfan sulfate based on structural similarities.
- (k) Value for endrin used as surrogate for endrin aldehyde and endrin ketone due to structural similarities.

LOUs 44 and 37 Table 9 Groundwater Characterization Data - Organochlorine Pesticides (OCPs)

Unit 6 Building Tronox Facility - Henderson, Nevada

	Sampling F	Program	Ph A ¹	
		Well ID	SA8	
	Sa	mple ID	M-29 ²	
	Sam	ple Date	11/17/2006	
Organochlorine Pesticides	MCL ³ ug/L		ug/L	Unit
4,4'-DDD	2.80E-01		0.050 U	ug/L
4,4'-DDE	1.98E-01		0.050 U	ug/L
4,4'-DDT	1.98E-01		0.050 U	ug/L
Aldrin	4.00E-03		0.050 U	ug/L
Alpha-BHC	1.10E-02		0.050 U	ug/L
Alpha-chlordane	2.00E+00	(I)	0.050 U	ug/L
Beta-BHC	3.74E-02		0.050 U	ug/L
Delta-BHC	1.10E-02	(z)	0.050 U	ug/L
Dieldrin	4.20E-03	(z)	0.050 U	ug/L
Endosulfan I	2.19E+02	(aa)	0.050 U	ug/L
Endosulfan II	2.19E+02	(aa)	0.050 U	ug/L
Endosulfan Sulfate	2.19E+02	(aa)	0.050 U	ug/L
Endrin	2.00E+00		0.050 U	ug/L
Endrin Aldehyde	1.09E+01	(k)	0.050 U	ug/L
Endrin Ketone	1.09E+01	(k)	0.050 U	ug/L
Gamma-BHC (Lindane)	2.00E-01		0.050 U	ug/L
Gamma-Chlordane	2.00E+00	(I)	0.050 U	ug/L
Heptachlor	4.00E-01		0.050 U	ug/L
Heptachlor Epoxide	2.00E-01		0.050 U	ug/L
Methoxychlor	4.00E+01		0.10 U	ug/L
Tech-Chlordane	2.00E+00	(I)	0.50 U	ug/L
Toxaphene	3.00E+00		2.0 U	ug/L

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. Groundwater grab sample taken from open borehole.
- 3. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
- (I) Value for chlordane used as surrogate for alpha-chlordane, chlordane (technical) and gamma-chlordane due to structural similarities.
- (z) Value for alpha-BHC used as surrogate for delta-BHC based on structural similarities.
- (aa) Value for endosulfan used as surrogate for endosulfan I, endosulfan II and endosulfan sulfate based on structural similarities.
- (k) Value for endrin used as surrogate for endrin aldehyde and endrin ketone due to structural similarities.

LOUs 44 and 37 Table 10 Soil Characterization Data - Organophosphorus Pesticides (OPPs)

Unit 6 Building Tronox Facility - Henderson, Nevada

	Sampling Program	Ph A ¹	
	Boring No.	SA8	
	Sample ID	SA8-0.5	
	Sample Depth (ft)	0.5	
	Sample Date	11/17/2006	
OPPs	MSSL ²	mg/kg	Unit
0113	mg/kg		
Azinphos-methyl		0.014 U	mg/kg
Bolstar		0.014 U	mg/kg
Chlorpyrifos	2.10E+03	0.021 U	mg/kg
Coumaphos		0.014 UJ	mg/kg
Demeton-O		0.041 U	mg/kg
Demeton-S		0.016 U	mg/kg
Diazinon	6.20E+02	0.023 U	mg/kg
Dichlorvos	6.60E+00	0.024 U	mg/kg
Dimethoate		0.023 U	mg/kg
Disulfoton	2.70E+01	0.050 U	mg/kg
EPN		0.014 U	mg/kg
Ethoprop		0.016 U	mg/kg
Ethyl Parathion	4.10E+03	0.019 U	mg/kg
Famphur		0.014 U	mg/kg
Fensulfothion		0.014 U	mg/kg
Fenthion	1.70E+02 (ff)	0.035 U	mg/kg
Malathion	1.40E+04	0.016 U	mg/kg
Merphos		0.032 U	mg/kg
Methyl parathion	1.70E+02	0.021 U	mg/kg
Mevinphos		0.016 U	mg/kg
Naled	1.40E+03	0.035 UJ	mg/kg
Phorate		0.021 U	mg/kg
Ronnel	3.40E+04	0.019 U	mg/kg
Stirphos		0.016 U	mg/kg
Sulfotep		0.021 U	mg/kg
Thionazin		0.019 U	mg/kg
Tokuthion		0.021 UJ	mg/kg
Trichloronate		0.021 U	mg/kg

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial Outdoor Worker (March, 2008).
- (ff) Value for methyl parathion used as surrogate for fenthion based on structural similarities.

LOUs 44 and 37 Table 11 Groundwater Characterization Data - Organophosphorus Pesticides (OPPs)

Unit 6 Building Tronox Facility - Henderson, Nevada

	Campling Drawan	DL 41	
	Sampling Program Well ID	Ph A ¹	
		SA8	
	Sample ID	M-29 ²	
	Sample Date	11/17/2006	
OPPs	MCL ³	ug/L	Unit
	ug/L	_	
Azinphos-methyl		2.5 U	ug/L
Bolstar		1.0 U	ug/L
Chlorpyrifos	1.09E+02	1.0 U	ug/L
Coumaphos		1.0 U	ug/L
Demeton-O	1.46E+00 (cc)	1.0 U	ug/L
Demeton-S	1.46E+00 (cc)	1.0 U	ug/L
Diazinon	3.28E+01	1.0 U	ug/L
Dichlorvos	2.32E-01	1.0 U	ug/L
Dimethoate	7.30E+00	1.0 U	ug/L
Disulfoton	1.46E+00	0.50 U	ug/L
EPN	3.65E-01	1.2 U	ug/L
Ethoprop		0.50 U	ug/L
Ethyl Parathion	9.12E+00 (tt)	1.0 U	ug/L
Famphur		1.0 U	ug/L
Fensulfothion		2.5 U	ug/L
Fenthion	9.10E+00 (ff)	2.5 U	ug/L
Malathion	7.30E+02	1.2 U	ug/L
Merphos	1.09E+00	5.0 U	ug/L
Methyl parathion	9.12E+00	4.0 U	ug/L
Mevinphos		6.2 U	ug/L
Naled	7.30E+01	1.0 UJ	ug/L
Phorate	7.30E+00	1.2 U	ug/L
Ronnel	1.82E+03	10 U	ug/L
Stirphos		3.5 U	ug/L
Sulfotep	1.82E+01	1.5 U	ug/L
Thionazin		1.0 U	ug/L
Tokuthion		1.6 U	ug/L
Trichloronate		0.50 U	ug/L

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. Groundwater grab sample taken from open borehole.
- 3. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
- (cc) Value for demeton used as surrogate for demeton-o and demeton-s based on structural similarities.
- (tt) Value for parathion-methyl used as surrogate for parathion-ethyl due to structural similarities.
- (ff) Value for methyl parathion used as surrogate for fenthion based on structural similarities.

LOUs 44 and 37 Table 12 Soil Characterization Data - PCBs

Unit 6 Building Tronox Facility - Henderson, Nevada

	Sampling Program	Ph A ¹	Ph A	Ph A	Ph A	Ph A	
	Boring ID	SA8	SA8	SA8	SA8	SA8	
	Sample ID	SA8-0.5	SA8-10	SA8-20	SA8-30	SA8-37	
	Sample Depth (ft)	0.5	10	20	30	37	
	Sample Date	11/17/2006	11/17/2006	11/17/2006	11/17/2006	11/17/2006	
PCBs	MSSL ²						Unit
1 003	mg/kg						Oilit
Aroclor-1016	2.40E+01 (i)	0.035 U	0.035 U	0.035 U	0.036 U	0.045 U	mg/kg
Aroclor-1221	8.30E-01 (i)	0.035 U	0.035 U	0.035 U	0.036 U	0.045 U	mg/kg
Aroclor-1232	8.30E-01 (i)	0.035 U	0.035 U	0.035 U	0.036 U	0.045 U	mg/kg
Aroclor-1242	8.30E-01 (i)	0.035 U	0.035 U	0.035 U	0.036 U	0.045 U	mg/kg
Aroclor-1248	8.30E-01 (i)	0.035 U	0.035 U	0.035 U	0.036 U	0.045 U	mg/kg
Aroclor-1254	8.30E-01 (i)	0.035 U	0.035 U	0.035 U	0.036 U	0.045 U	mg/kg
Aroclor-1260	8.30E-01 (i)	0.035 U	0.035 U	0.035 U	0.036 U	0.045 U	mg/kg

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial Outdoor Worker (March, 2008)
- (i) For PCBs, the individual Aroclors were compared to the TSCA action level of 10 mg/kg, for high occupancy, restricted (non-residential) use. (40 CFR Part 761; 63 FR 35383-35474, June 29, 1998).

LOUs 44 and 37 Table 13 Groundwater Characterization Data - PCBs

Unit 6 Building Tronox Facility - Henderson, Nevada

S	ampling Program	Ph A ¹	
	Well ID	SA8	
	Sample ID	$M-29^{2}$	
	Sample Date	11/17/2006	
PCBs	MCL ³		Unit
PGD5	ug/L		Offic
Aroclor-1016	5.00E-01 (bb)	0.10 UJ	ug/L
Aroclor-1221	5.00E-01 (bb)	0.10 UJ	ug/L
Aroclor-1232	5.00E-01 (bb)	0.10 UJ	ug/L
Aroclor-1242	5.00E-01 (bb)	0.10 UJ	ug/L
Aroclor-1248	5.00E-01 (bb)	0.10 UJ	ug/L
Aroclor-1254	5.00E-01 (bb)	0.10 UJ	ug/L
Aroclor-1260	5.00E-01 (bb)	0.10 UJ	ug/L

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. Groundwater grab sample taken from open borehole.
- 3. U.S. EPA Maximum Contaminant Level (MCL) values unless noted. (bb) Value for total PCBs.

LOUs 44 and 37 Table 14 Soil Characterization Data - Perchlorate

Unit 6 Building Tronox Facility - Henderson, Nevada

Boring ID	Sample ID	Sample Depth (ft)	Sample Date	Perchlorate ug/kg	MSSL ¹ ug/kg	Sampling Program
SA8	SA8-0.5	0.5	11/17/2006	17500	7.95E+05	Ph A ²
SA8	SA8-10	10	11/17/2006	1500	7.95E+05	Ph A
SA8	SA8-20	20	11/17/2006	3300	7.95E+05	Ph A
SA8	SA8-30	30	11/17/2006	2690	7.95E+05	Ph A
SA8	SA8-37	37	11/17/2006	12100	7.95E+05	Ph A

- 1. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial Outdoor Worker (March, 2008).
- 2. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.

LOUs 44 and 37 Table 15 Groundwater Characterization Data - Perchlorate

Unit 6 Building Tronox Facility - Henderson, Nevada

Well ID Number	Sample ID	Sample Date	Perchlorate	Perchlorate Units		Sampling Program
SA8	M-29 ²	11/17/2006	2410	ug/L	1.80E+01 a,(m)	Ph A ³

- 1. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
- 2. Groundwater grab sample taken from open borehole.
- 3. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- (a) NAC 445A.455 Secondary standards. Certain provisions of the National Primary Drinking Water Regulations are adopted by reference (NAC 445A.4525). These values are listed in the first column of this table and are therefore not listed again here. Only NAC 445A.455 Secondary standards are listed.
- (m) Equal to the provisional action level derived by NDEP as referenced in "Defining a Perchlorate Drinking Water Standard". NDEP Bureau of Corrective Action. URL [http://ndep.nv.gov/bca/perchlorate02_05.htm].

LOUs 44 and 37 Table 16 Soil Characterization Data - Radionuclides

Unit 6 Building Tronox Facility - Henderson, Nevada

				Ra-226	Ra-228	Th-228	Th-230	Th-232	U-233/234	U-235/236	U-238	
				(gamma)	(gamma)	(TH MOD)	(TH MOD)	(TH MOD)	(U MOD)	(U MOD)	(U MOD)	
				pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	
Boring ID Number	Sample ID	Sample Depth (ft)	Date									Sampling Program
SA8	SA8-0.5	0.5	11/17/2006	1.07 J-	1.76 J-							Ph A ¹
SA8	SA8-10	10	11/17/2006	1.08 J-	2.05 UJ							Ph A
SA8	SA8-20	20	11/17/2006	1 J-	1.88 J-							Ph A
SA8	SA8-30	30	11/17/2006	1.34 J-	1.85 J-							Ph A
SA8	SA8-37	37	11/17/2006	3.16 J-	0.771 UJ							Ph A

Notes:

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada, September 2007.

LOUs 44 and 37 Table 17 Groundwater Characterization Data - Radionuclides

Unit 6 Building Tronox Facility - Henderson, Nevada

			Ra-226	Ra-228	Th-228	Th-230	Th-232	U-233/234	U-235/236	U-238	
			pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	
Well ID	Sample ID	Data									Sampling
Number	Sample ID	Date									Program
SA8	M-29 ¹	11/17/2006	0.745 J	0.602 UJ							Ph A ²

- 1. Denotes groundwater grab sample taken from open borehole (filtered in the field to remove suspended particulates >0.45 um).
- 2. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.

LOUs 44 and 37 Table 18 Soil Characterization Data - SVOCs

Unit 6 Building Tronox Facility - Henderson, Nevada

	Sar	npling Progr	ram	Ph A ¹	Ph A	Ph A	Ph A	Ph A
		Boring		SA8	SA8	SA8	SA8	SA8
		Sample		SA8-0.5	SA8-10	SA8-20	SA8-30	SA8-37
	Sa	ample Depth			10	20	30	37
		Sample D				11/17/2006		11/17/2006
		_						
svoc	Analytical			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	Method	ug/kg		0 0	0 0	0 0	0 0	0 0
1,4-Dioxane	non-SIM	1.70E+05		69 U	350 U	350 U	360 U	450 U
2-Methylnaphthalene	non-SIM	2.10E+05	(jj)	350 U	350 U	350 U	360 U	450 U
2-Methylnaphthalene	SIM		(jj)	6.9 U				
Acenaphthene	non-SIM	3.30E+07		350 U	350 U	350 U	360 U	450 U
Acenaphthene	SIM	3.30E+07		6.9 U				
Acenaphthylene	non-SIM		pp)	350 U	350 U	350 U	360 U	450 U
Acenaphthylene	SIM		pp)	6.9 U				
Anthracene	non-SIM	1.00E+08		350 U	350 U	350 U	360 U	450 U
Anthracene	SIM	1.00E+08		6.9 U				
Benz(a)anthracene	non-SIM	2.30E+03		350 U	350 U	350 U	360 U	450 U
Benz(a)anthracene	SIM	2.30E+03		6.9 U				
Benzo(a)pyrene	non-SIM	2.30E+02		350 U	350 U	350 U	360 U	450 U
Benzo(a)pyrene	SIM	2.30E+02		6.9 U				
Benzo(b)fluoranthene	non-SIM	2.30E+03		350 U	350 U	350 U	360 U	450 U
Benzo(b)fluoranthene	SIM	2.30E+03		6.9 U				
Benzo(g,h,i)perylene	non-SIM		(w)	350 U	350 U	350 U	360 U	450 U
Benzo(g,h,i)perylene	SIM		(w)	6.9 U				
Benzo(k)fluoranthene	non-SIM	2.30E+04		350 U	350 U	350 U	360 U	450 U
Benzo(k)fluoranthene	SIM	2.30E+04		6.9 U				
bis(2-Ethylhexyl)phthalate	non-SIM	1.40E+05		350 U	350 U	350 U	360 U	450 U
Butyl benzyl phthalate	non-SIM	2.40E+05		350 U	350 U	350 U	360 U	450 U
Chrysene	non-SIM	2.30E+05		350 U	350 U	350 U	360 U	450 U
Chrysene	SIM	2.30E+05		7.0				
Dibenz(a,h)anthracene	non-SIM	2.30E+02		350 U	350 U	350 U	360 U	450 U
Dibenz(a,h)anthracene	SIM	2.30E+02		6.9 U	0 = 0 1 1	0.70.11	00011	4=0.11
Diethyl phthalate	non-SIM	1.00E+08		350 U	350 U	350 U	360 U	450 U
Dimethyl phthalate	non-SIM	1.00E+08		350 U	350 U	350 U	360 U	450 U
Di-N-Butyl phthalate	non-SIM	6.80E+07		350 U	350 U	350 U	360 U	450 U
Di-N-Octyl phthalate Fluoranthene	non-SIM	 2.40E+07		350 U	350 U	350 U	360 U	450 U
	non-SIM SIM	2.40E+07 2.40E+07		350 U	350 U	350 U	360 U	450 U
Fluoranthene	non-SIM	2.40E+07 2.60E+07		27 350 U	350 U	350 U	360 11	450 II
Fluorene Fluorene	SIM	2.60E+07 2.60E+07		6.9 U	330 0	330 0	360 U	450 U
Hexachlorobenzene	non-SIM	1.20E+07		350 U	350 U	350 U	360 U	450 U
Hexachlorobenzene	SIM	1.20E+03 1.20E+03		6.9 U	330 0	350 0	300 0	450 0
Indeno(1,2,3-cd)pyrene	non-SIM	2.30E+03		350 U	350 UJ	350 UJ	360 UJ	450 UJ
Indeno(1,2,3-cd)pyrene	SIM	2.30E+03		6.9 U	330 03	330 03	300 03	400 00
Naphthalene	non-SIM	2.30E+03 2.10E+05		0.79 J	5.3 U	5.2 U	5.5 U	6.8 U
Naphthalene	non-SIM	2.10E+05 2.10E+05		350 U	350 U	350 U	360 U	450 U
Naphthalene	SIM	2.10E+05 2.10E+05		6.9 U	330 0	330 0	300 0	450 0
Nitrobenzene	non-SIM	1.10E+05			350 11	350 11	36011	450 II
INITIONELIZETIE	11011-01111	1.10⊑+03		350 U	350 U	350 U	360 U	450 U

LOUs 44 and 37 Table 18 (continued) Soil Characterization Data - SVOCs

Unit 6 Building Tronox Facility - Henderson, Nevada

	Ph A ¹	Ph A	Ph A	Ph A	Ph A		
Boring No.			SA8	SA8	SA8	SA8	SA8
	SA8-0.5	SA8-10	SA8-20	SA8-30	SA8-37		
	Sa	ample Depth (ft)	0.5	10	20	30	37
		Sample Date	11/17/2006	11/17/2006	11/17/2006	11/17/2006	11/17/2006
svoc	Analytical Method	MSSL² ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Octachlorostyrene	non-SIM		350 U	350 U	350 U	360 U	450 U
Phenanthrene	non-SIM	1.00E+08 (n)	350 U	350 U	350 U	360 U	450 U
Phenanthrene	SIM	1.00E+08 (n)	6.9 U				
Pyrene	non-SIM	3.20E+07	350 U	350 U	350 U	360 U	450 U
Pyrene	SIM	3.20E+07	12				
Pyridine	non-SIM	6.80E+05	1700 U	1700 U	1700 U	1700 U	2200 U

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial Outdoor Worker (March, 2008).
- (jj) Value for naphthalene used as surrogate for 2-methylnaphthalene based on structural similarities.
- (pp) Value for acenaphthene used as surrogate for acenapthylene based on structural similarities.
- (w) Value for pyrene used as surrogate for benzo(g,h,i)perylene based on structural similarities.
- (n) Value for anthracene used as surrogate for phenanthrene due to structural similarities.

LOUs 44 and 37 Table 19 Groundwater Characterization Data - SVOCs

Unit 6 Building Tronox Facility - Henderson, Nevada

	s	ampling Pro	gram	Ph A ¹
			II No.	SA8
				M-29 (GWSA08)
		Sample		11/17/2006
	Analytic	MCL ²	Duto	
SVOCs	Method	ug/L		ug/L
1,4-Dioxane	non-SIM	6.11E+00		10 U
2-Methylnaphthalene	non-SIM	6.20E+00	(jj)	10 U
2-Methylnaphthalene	SIM	6.20E+00	(jj)	
Acenaphthene	non-SIM	3.65E+02	())/	10 U
Acenaphthene	SIM	3.65E+02		
Acenaphthylene	non-SIM	+	(pp)	10 U
Acenaphthylene	SIM	+	(pp)	
Anthracene	non-SIM	1.83E+03	(1.1.)	10 U
Anthracene	SIM	1.83E+03		
Benz(a)anthracene	non-SIM	9.21E-02		10 U
Benz(a)anthracene	SIM	9.21E-02		
Benzo(a)pyrene	non-SIM	2.00E-01		10 U
Benzo(a)pyrene	SIM	2.00E-01		
Benzo(b)fluoranthene	non-SIM	9.21E-02		10 U
Benzo(b)fluoranthene	SIM	9.21E-02		
Benzo(g,h,i)perylene	non-SIM	1.83E+02	(w)	10 U
Benzo(g,h,i)perylene	SIM	1.83E+02	(w)	
Benzo(k)fluoranthene	non-SIM	9.21E-01	` '	10 U
Benzo(k)fluoranthene	SIM	9.21E-01		
bis(2-Ethylhexyl)phthalate	non-SIM	6.00E+00		1.5 J
Butyl benzyl phthalate	non-SIM	7.30E+03		10 U
Chrysene	non-SIM	9.21E+00		10 U
Chrysene	SIM	9.21E+00		
Dibenz(a,h)anthracene	non-SIM	9.21E-03		10 U
Dibenz(a,h)anthracene	SIM	9.21E-03		
Diethyl phthalate	non-SIM	2.92E+04		10 U
Dimethyl phthalate	non-SIM	3.65E+05		10 U
Di-N-Butyl phthalate	non-SIM	3.65E+03		10 U
Di-N-Octyl phthalate	non-SIM	1.46E+03		10 U
Fluoranthene	non-SIM	1.46E+03		10 U
Fluoranthene	SIM	1.46E+03		
Fluorene	non-SIM	2.43E+02		10 U
Fluorene	SIM	2.43E+02		
Hexachlorobenzene	non-SIM	1.00E+00		10 U
Hexachlorobenzene	SIM	1.00E+00		
Indeno(1,2,3-cd)pyrene	non-SIM	9.21E-02		10 U
Indeno(1,2,3-cd)pyrene	SIM	9.21E-02		
Naphthalene	non-SIM	6.20E+00		5.0 U
Naphthalene	non-SIM	6.20E+00		10 U
Naphthalene	SIM	6.20E+00		
Nitrobenzene	non-SIM	3.40E+00		10 U
Octachlorostyrene	non-SIM			10 U

LOUs 44 and 37 Table 19 (continued) Groundwater Characterization Data - SVOCs

Unit 6 Building Tronox Facility - Henderson, Nevada

	Ph A ¹		
	SA8		
		Sample ID	M-29 (GWSA08)
		Sample Date	11/17/2006
SVOCs	Analytic	MCL ²	/1
SVOCS	Method	ug/L	ug/L
Phenanthrene	non-SIM	1.80E+03 (n)	10 U
Phenanthrene	SIM	1.80E+03 (n)	
Pyrene	non-SIM	1.83E+02	10 U
Pyrene	SIM	1.83E+02	
Pyridine	non-SIM	3.65E+01	20 U

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- 2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
- (jj) Value for naphthalene used as surrogate for 2-methylnaphthalene based on structural similarities.
- (pp) Value for acenaphthene used as surrogate for acenapthylene based on structural similarities.
- (w) Value for pyrene used as surrogate for benzo(g,h,i)perylene based on structural similarities.
- (n) Value for anthracene used as surrogate for phenanthrene due to structural similarities.

LOUs 44 and 37 Table 20 Soil Characteristic Data - TPH and Fuel Alcohols

Unit 6 Building Tronox Facility - Henderson, Nevada

					Fuel Alcoh	ols	Total Pet	roleum Hydr	ocarbons	
				Ethanol	Ethylene glycol	Methanol	TPH - ORO	TPH - DRO	TPH - GRO	
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
			MSSL ¹ mg/kg		1.00E+05	1.00E+05	1.00E+02 vv	1.00E+02 vv	1.00E+02 vv	
Boring No.	Sample ID.	Sample Depth (ft)	Sample Date							Sampling Program
SA8	SA8-0.5	0.5	11/17/2006			530 U	3600	0.13		Ph A ²
SA8	SA8-10	10	11/17/2006			27 U	27 U	0.11 U		Ph A
SA8	SA8-20	20	11/17/2006			26 U	26 U	0.10 U		Ph A
SA8	SA8-30	30	11/17/2006			27 U	27 U	0.11 U		Ph A
SA8	SA8-37	37	11/17/2006			34 U	34 U	0.14 U		Ph A

- 1. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial Outdoor Worker (March, 2008).
- 2. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- (w) Value for pyrene used as surrogate for benzo(g,h,i)perylene based on structural similarities.

LOUs 44 and 37 Table 21 Soil Characterization Data - VOCs

Unit 6 Building Tronox Facility - Henderson, Nevada

	Sampling Program	Ph A ¹	Ph A	Ph A	Ph A	Ph A
	Boring No.	SA8	SA8	SA8	SA8	SA8
	Sample ID	SA8-0.5	SA8-10	SA8-20	SA8-30	SA8-37
	Sample Depth (ft)		10	20	30	37
	Sample Date					11/17/2006
	MSSL ²					
VOCs	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Naphthalene	2.10E+05	0.79 J	5.3 U	5.2 U	5.5 U	6.8 U
1,1,1,2-Tetrachloroethane	7.60E+03	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,1,1-Trichloroethane	1.40E+06	0.95 J	5.3 U	5.2 U	5.5 U	6.8 U
1,1,2,2-Tetrachloroethane	9.70E+02	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,1,2-Trichloroethane	2.10E+03	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,1-Dichloroethane	2.30E+06	3.0 J	5.3 U	5.2 U	5.5 U	6.8 U
1,1-Dichloroethene	4.70E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,1-Dichloropropene	1.75E+03 (gg)	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,2,3-Trichlorobenzene	2.60E+05 (hh)	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,2,3-Trichloropropane	1.60E+03	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,2,4-Trichlorobenzene	2.60E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,2,4-Trimethylbenzene	2.20E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,2-Dibromo-3-chloropropane	2.00E+01	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,2-Dichlorobenzene	3.70E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,2-Dichloroethane	8.40E+02	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,2-Dichloropropane	8.50E+02	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,3,5-Trimethylbenzene	7.80E+04	5.3 UJ	5.3 UJ	5.2 UJ	5.5 UJ	6.8 UJ
1,3-Dichlorobenzene	1.40E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,3-Dichloropropane	4.10E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
1,4-Dichlorobenzene	8.10E+03	16 J	5.3 U	5.2 U	5.5 U	6.8 U
2,2-Dichloropropane	8.50E+02 (ii)	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
2-Butanone	3.40E+07	14 J	11 U	38	14	14 U
2-Chlorotoluene	5.10E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
2-Hexanone	1.72E+07 (nn)	11 UJ	11 UJ	3.8 J	11 UJ	14 UJ
2-Methoxy-2-methyl-butane		5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
4-Chlorotoluene	5.10E+05 (ww)	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
4-Isopropyltoluene	` ´	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
4-Methyl-2-pentanone	1.70E+07	11 UJ	11 U	10 U	11 U	14 U
Acetone	6.00E+07	90 J	24	250	100	45
Benzene	1.60E+03	5.3 UJ	5.3 U	0.62 J	0.72 J	6.8 U
Bromobenzene	1.20E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Bromochloromethane	1.75E+03 (qq)	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Bromodichloromethane	2.60E+03	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Bromoform	2.40E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Bromomethane	1.50E+04	11 UJ	11 UJ	10 UJ	11 UJ	14 UJ
Carbon tetrachloride	5.80E+02	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Chlorobenzene	5.00E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Chloroethane	7.20E+03	5.3 UJ	5.3 UJ	5.2 UJ	5.5 UJ	6.8 UJ
Chloroform	5.80E+02	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Chloromethane	1.70E+05	5.3 UJ	5.3 UJ	5.2 UJ	5.5 UJ	6.8 UJ
cis-1,2-Dichloroethene	1.60E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
cis-1,3-Dichloropropene	1.75E+03 (gg)	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Dibromochloromethane	2.60E+03	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U

LOUs 44 and 37 Table 21 (continued) Soil Characterization Data - VOCs

Unit 6 Building Tronox Facility - Henderson, Nevada

Sa	mpling Program	Ph A ¹	Ph A	Ph A	Ph A	Ph A
	Boring No.	SA8	SA8	SA8	SA8	SA8
	Sample ID	SA8-0.5	SA8-10	SA8-20	SA8-30	SA8-37
S	ample Depth (ft)	0.5	10	20	30	37
	Sample Date	11/17/2006	11/17/2006	11/17/2006	11/17/2006	11/17/2006
VOCs	MSSL ²	ua/ka	ua/ka	ua/ka	ug/kg	ug/kg
VOCS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dibromomethane	5.90E+05 (xx)	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Dichlorodifluoromethane	3.40E+05	5.3 UJ	5.3 UJ	5.2 UJ	5.5 UJ	6.8 UJ
Ethyl t-butyl ether	7.90E+04 (kk)	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Ethylbenzene	2.30E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Ethylene dibromide	7.00E+01	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Hexachlorobutadiene	2.50E+04	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
isopropyl ether		5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Isopropylbenzene	5.80E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Methyl tert butyl ether	7.90E+04	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Methylene chloride	2.20E+04	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
N-Butylbenzene	2.40E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
N-Propylbenzene	2.40E+05	5.3 UJ	5.3 UJ	5.2 UJ	5.5 UJ	6.8 UJ
sec-Butylbenzene	2.20E+05	5.3 UJ	5.3 UJ	5.2 UJ	5.5 UJ	6.8 UJ
Styrene	1.70E+06	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
t-Butyl alcohol		11 UJ	11 UJ	10 UJ	11 UJ	14 UJ
tert-Butylbenzene	3.90E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Tetrachloroethene	1.70E+03	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Toluene	5.20E+05	0.82 J	5.3 U	5.2 U	5.5 U	6.8 U
trans-1,2-Dichloroethylene	2.00E+05	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
trans-1,3-Dichloropropene	1.75E+03 (gg)	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Trichloroethene	1.00E+02	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Trichlorofluoromethane	1.40E+06	5.3 UJ	5.3 UJ	5.2 UJ	5.5 UJ	6.8 UJ
Vinylchloride	8.60E+02	5.3 UJ	5.3 U	5.2 U	5.5 U	6.8 U
Xylene (Total)	2.10E+05	11 UJ	11 U	10 U	11 U	14 U

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility Henderson, Nevada, September 2007.
- 2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial Outdoor Worker (March, 2008).
- (gg) Value for 1,3-dichloropropene used as surrogate for 1,1-dichloropropene, cis-1,3-dichloropropene and trans-1,3-dichloropropene based on structural similarities.
- (hh) Value for 1,2,4-trichlorobenzene used as surrogate for 1,2,3-trichlorobenzene based on structural similarities.
- (ii) Value for 1,2-dichloropropane used as surrogate for 2,2-dichloropropane based on structural similarities.
- (nn) Value for methyl isobutyl ketone used as surrogate for 2-hexanone based on structural similarities.
- (ww) Value for 2-chlorotoluene used as surrogate for 4-chlorotoluene based on structural similarities.
- (qq) Value for bromodichloromethane used as surrogate for bromochloromethane due to structural similarities.
- (xx) Value for methylene bromide used as surrogate for dibromomethane based on structural similarities.
- (kk) Value for methyl tertbutyl ether (MTBE) used as surrogate for ethyl-tert-butyl ether (ETBE) based on structural similarities.

LOUs 44 and 37 Table 22 Groundwater Characteristic Data - VOCs

Unit 6 Building Tronox Facility - Henderson, Nevada

		D: A1
	Sampling Program	Ph A ¹
	Well ID	M-29
	Sample ID	M-29
	Sample Date	11/17/2006
VOCs	MCL ²	ug/L
	ug/L	-
Naphthalene	6.20E+00	5.0 U
1,1,1,2-Tetrachloroethane	4.32E-01	5.0 U
1,1,1-Trichloroethane	2.00E+02	5.0 U
1,1,2,2-Tetrachloroethane	5.00E+00	5.0 U
1,1,2-Trichloroethane	5.00E+00	5.0 U
1,1-Dichloroethane	8.11E+02	5.0 U
1,1-Dichloroethene	7.00E+00	5.0 U
1,1-Dichloropropene	3.95E-01 gg	5.0 U
1,2,3-Trichlorobenzene	7.16E+00 hh	5.0 U
1,2,3-Trichloropropane	5.60E-03	5.0 U
1,2,4-Trichlorobenzene	7.00E+01	5.0 U
1,2,4-Trimethylbenzene	1.23E+01	5.0 U
1,2-Dibromo-3-chloropropane	2.00E-01	5.0 U
1,2-Dichlorobenzene	6.00E+02	5.0 U
1,2-Dichloroethane	5.00E+00	5.0 U
1,2-Dichloropropane	5.00E+00	5.0 U
1,3,5-Trimethylbenzene	1.23E+01	5.0 U
1,3-Dichlorobenzene	1.83E+02	5.0 U
1,3-Dichloropropane	1.22E+02	5.0 U
1,4-Dichlorobenzene	7.50E+01	0.92 J
2,2-Dichloropropane	1.65E-01 ii	5.0 U
2-Butanone	6.97E+03	10 U
2-Chlorotoluene	1.22E+02	5.0 U
2-Hexanone	2.00E+03 nn	10 UJ
2-Methoxy-2-methyl-butane		5.0 U
4-Chlorotoluene	1.22E+02 ww	5.0 U
4-Isopropyltoluene		5.0 U
4-Methyl-2-pentanone	1.99E+03	10 UJ
Acetone	5.48E+03	10 U
Benzene	5.00E+00	5.0 U
Bromobenzene	2.03E+01	5.0 U
Bromochloromethane	1.81E-01 qq	5.0 U
Bromodichloromethane	8.00E+01 r	5.0 U
Bromoform	8.00E+01 r	5.0 U
Bromomethane	8.66E+00	10 U
Carbon tetrachloride	5.00E+00	5.0 U
Chlorobenzene	1.00E+02 o	5.0 U
Chloroethane	4.64E+00	5.0 UJ
Chloroform	8.00E+01 r	4.1 J
Chloromethane	1.58E+02	5.0 UJ
cis-1,2-Dichloroethene	7.00E+01	5.0 U
cis-1,3-Dichloropropene	3.95E-01 gg	5.0 U
Dibromochloromethane	8.00E+01 r	5.0 U
Dibromomethane	6.08E+01 xx	5.0 U
Dichlorodifluoromethane	3.95E+02	5.0 UJ
Ethyl t-butyl ether	1.10E+01 kk	5.0 U
Ethylbenzene	7.00E+02	5.0 U
Ethylene dibromide	7.00E+02	5.0 U
Hexachlorobutadiene	8.62E-01	5.0 U
i iexaciliorobutadiene	0.02E-01	5.0 0

LOUs 44 and 37 Table 22 (continued) Groundwater Characteristic Data - VOCs

Unit 6 Building Tronox Facility - Henderson, Nevada

	Sampling Program	Ph A ¹
	. Well ID	M-29
	Sample ID	M-29
	Sample Date	11/17/2006
VOCs	MCL ²	/1
VOCS	ug/L	ug/L
isopropyl ether		5.0 U
Isopropylbenzene	6.58E+02	5.0 U
Methyl tert butyl ether	2.00E+01 a,uu	5.0 U
Methylene chloride	5.00E+00	5.0 U
N-Butylbenzene	2.43E+02	5.0 U
N-Propylbenzene	2.43E+02	5.0 U
sec-Butylbenzene	2.43E+02	5.0 U
Styrene	1.00E+02	5.0 U
t-Butyl alcohol		10 UJ
tert-Butylbenzene	2.43E+02	5.0 U
Tetrachloroethene	5.00E+00	5.0 U
Toluene	1.00E+03	5.0 U
trans-1,2-Dichloroethylene	1.00E+02	5.0 U
trans-1,3-Dichloropropene		5.0 U
Trichloroethene	5.00E+00	5.0 U
Trichlorofluoromethane		5.0 UJ
Vinylchloride	2.00E+00	5.0 U
Xylene (Total)	1.00E+04	10 U

- 1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility Henderson, Nevada, September 2007.
- 2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
- (gg) Value for 1,3-dichloropropene used as surrogate for 1,1-
- dichloropropene, cis-1,3-dichloropropene and trans-1,3-dichloropropene based on structural similarities.
- (hh) Value for 1,2,4-trichlorobenzene used as surrogate for 1,2,3-trichlorobenzene based on structural similarities.
- (ii) Value for 1,2-dichloropropane used as surrogate for 2,2-dichloropropane based on structural similarities.
- (nn) Value for methyl isobutyl ketone used as surrogate for 2-hexanone based on structural similarities.
- (ww) Value for 2-chlorotoluene used as surrogate for 4-chlorotoluene based on structural similarities.
- (qq) Value for bromodichloromethane used as surrogate for bromochloromethane due to structural similarities.
- (o) See footnote (b). Listed under synonym monochlorobenzene.
- (xx) Value for methylene bromide used as surrogate for dibromomethane based on structural similarities.
- (kk) Value for methyl tertbutyl ether (MTBE) used as surrogate for ethyltert-butyl ether (ETBE) based on structural similarities.
- (a) NAC 445A.455 Secondary standards. Certain provisions of the National Primary Drinking Water Regulations are adopted by reference (NAC 445A.4525). These values are listed in the first column of this table and are therefore not listed again here. Only NAC 445A.455 Secondary standards are listed.
- (uu) NDEP, 1998. Oxygenated Fuel Corrective Action Guidance. Draft. October, 12 1998. URL [http://ndep.nv.gov/bca/mtbe_doc.htm].

LOUs 44 and 37 Table 23 Soil Characterization Data - Long Asbestos Fibers in Respirable Soil Fraction

Unit 6 Building Tronox Facility - Henderson, Nevada

			Long Amphibole Protocol Structures	Long Amphibole Protocol Structures	Long Chrysotile Protocol Structures	Long Chrysotile Protocol Structures	Sampling Program
No.	Sample ID	Sample Date	s/gPM10	(structures/samples)	s/gPM10	(structures/samples)	
SA8	SA8	12/07/2006	2997000 U	0	5990000	2	Ph A ¹

Notes:

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.

LOUs 44 and 37 **Notes for Phase A Data Tables**

Unit 6 Building Tronox Facility - Henderson, Nevada

Blank Not analyzed.

Bold values are constituents detected above the laboratory sample quantitation limit. Bold

Grav Grayed out values are non-detected values with the laboratory sample quantitation limits shown.

В The result may be a false positive totally attributable to blank contamination.

Dissolved Metals D DO Dissolved Oxygen

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the

analyte in the sample.

The result is an estimated quantity and the result may be biased low. J-J+ The result is an estimated quantity and the result may be biased high. JΒ The result may be biased high partially attributable to blank contamination.

JK The result is an estimated maximum possible concentration.

The result was rejected and unusable due to serious data deficiencies. The presence or absence of the analyte R

cannot be verified.

S Soluable metals Т **Total Metals**

U The analyte was analyzed for, but was not detected above the laboratory sample quantitation limit.

UJ The analyte was not detected above the laboratory sample quantitation limit and the limit is approximate

mg/kg Milligrams per kilogram mg/L Milligrams per liter ml/min Milliliters per minute ng/kg Nanogram per kilogram

Not measured. nm

NTUs Nephelometric Turbidity Units **ORP** Oxidation-reduction potential

PicoCuries per gram pCi/g pci/L PicoCuries per liter

s/qPM10 Revised protocol structures per gram PM10 fraction dust.

TEF Toxic Equivalency Factor **TEQ Toxic Equivalent Concentration** ug/kg Micrograms per kilogram Micrograms per liter ug/L

umhos/cm MicroSiemens per centimeter

L Sample ID suffix indicating the sample was collected using low low-flow pumping rates (100-150 ml/min). F

Sample ID suffix indicating the sample was collected using low-flow pumping rates (150-480 ml/min) and field

Ζ Sample ID suffix indicating the sample was collected using low-flow pumping rates (150-480 ml/min).

No analytical data is available for this sample due to a laboratory error.

(a) Calculated assuming 0 for non-detected congeners and 2006 toxic equivalency factors (TEFs).

Calculated assuming 1/2 detection limit as proxy for non-detected congeners and 2006 TEFs. (b)

Not established