

**Summary of Available Data for LOU 32 –  
Chromium and Perchlorate Groundwater Remediation Unit  
Tronox Facility – Henderson, Nevada**

<b>Name of Facility:</b>	<b>Chromium and Perchlorate Groundwater Remediation Unit</b>
<b>Goal of Closure:</b>	<ul style="list-style-type: none"> <li>• Continuation of current use – regulatory closure not presently requested.</li> </ul>
<b>Site Investigation Area:</b>	<ul style="list-style-type: none"> <li>• Size: Approximately 1,470 feet by 510 feet (17.2 acres) [Ref. 1].</li> <li>• Location: South of Warm Springs Road.</li> <li>• Current Status/Features: LOU 32 is currently active and includes the chromium and perchlorate groundwater remediation units and includes the GW-11 Pond and the area to the southeast of the GW-11 Pond (not originally within the LOU 32 boundary). LOU 32 also includes portions of LOUs 1, 55, and 58.</li> </ul>
<b>Description:</b>	<ul style="list-style-type: none"> <li>• The Chromium and Perchlorate Groundwater Remediation Unit intercepts and treats a plume of hexavalent chromium and perchlorate-impacted shallow groundwater from beneath the Site [Ref. 5].</li> <li>• LOU 32 consists of a groundwater barrier wall, interceptor wells, two recharge trenches, the chromium treatment system, groundwater monitoring wells, associated piping, and (since 1998) a perchlorate treatment system and the GW-11 Pond [Ref. 1]. <ul style="list-style-type: none"> <li>– <u>Interceptor wells</u>: Initially the system was made up of 11 groundwater interceptor wells (I-AR through I-K) in a 900-foot-long configuration. <ul style="list-style-type: none"> <li>▪ Fifteen additional groundwater wells (I-L through I-Z) were progressively installed in 1993, 1998, 1999, 2000, and 2003 [Ref. 4].</li> <li>▪ A twenty-seventh interceptor well (I-AA) was installed in December 2007 [ENSR, report in-preparation].</li> </ul> </li> <li>– <u>Groundwater barrier wall</u>: The barrier wall is approximately 1,600 feet in length, three feet thick, 60 feet deep, and consists of a slurry of bentonite clay mixed with the native soil removed from the trench excavation. This includes about 30 feet of alluvium and 30 feet of Muddy Creek formation materials [Ref. 8].</li> </ul> </li> </ul>

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- Groundwater Recharge Trenches: The initial treatment system consisted of two recharge trenches constructed in 1985 or 1986. They were approximately three feet wide, five feet deep, and several hundred feet long [Ref. 8].
  - In 1994, the trench walls became plugged with an iron precipitate material causing brownish red water to flow on to the ground surface [Ref. 8].
  - The trenches were replaced in 1994 and the iron material and gravel were disposed of as non-hazardous waste [Ref. 8].
  - Two east-west trending replacement recharge trenches, 75 feet apart and approximately 250 feet north of the interceptor well line, were constructed in 1994. The replacement trenches are approximately 800-feet and 1,100 feet long, respectively [Ref. 8].
- Groundwater monitoring wells: Wells upgradient, downgradient, and in the immediate vicinity of the barrier wall and interceptor well system are used to evaluate the impact of the interceptor wells and the recharge system [Ref. 1].
- Chromium Treatment Plant: Groundwater from the interceptor wells flow to the chromium treatment plant, where an electrolytic reduction process is used to reduce hexavalent chromium to trivalent chromium. This process generates an iron oxide sludge that contains heavy metals [Ref. 1].
- GW-11 Pond: This lined pond is approximately 11-acres and is used as a temporary holding pond. Treated groundwater from the chromium treatment unit flows into the GW-11 Pond prior to entering the perchlorate treatment system [Ref. 2].
- Perchlorate Treatment Plant: Water from the GW-11 Pond flows into the Perchlorate Treatment Plant - a biological Fluidized-Bed Reactor (FBR) designed to remove perchlorate from the recovered groundwater [Ref. 2]. The system is capable of treating 825 gallons per minute (gpm) [Ref. 2].
- Associated piping: Piping located with the LOU 32 boundary.

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- Sodium dichromate (hexavalent chromium) was used in the production of sodium chlorate and sodium perchlorate in Units 4 and 5 [Ref. 5]. A more detailed discussion is provided in the LOU 43 data package (Unit 4 Basement) summary.
- Groundwater remediation for chromium began in September 1987 in response to the September 1986 NDEP Consent Order [Ref 5].
- Chromium treatment capacity ranges from 65 to 100 gpm [Ref. 5, 6].
- Waste product (iron oxide sludge and filter cake) generated at the chromium treatment facility has been characterized as non-hazardous and is placed in a drum and transported off-site for disposal [Ref. 5].
- The concrete pad (approximately 60 feet by 20 feet) on which the chromium treatment unit is located, slopes gently to the north toward a sump along the north berm; water in the sump is recycled back into the treatment system [Ref. 5].
- In 1991, no cracks, cold joints, or other types of deterioration of the concrete containment pad and berms were observed [Ref. 5].
- Prior to 1998, groundwater was pumped from the interceptor wells, treated to remove hexavalent chromium, and injected into the recharge trenches [Ref. 7].
- In 1998, the GW-11 pond was constructed as part of the perchlorate treatment system [Ref. 7], in accordance with the Administrative Order on Consent for remediation of perchlorate impacted groundwater in the Henderson area, October 8, 2001 (as amended) [Ref. 3].
- Since December 30, 1998, effluent from the chromium treatment system has been re-directed from the recharge trenches to the GW-11 pond for temporary containment. An interim ion-exchange perchlorate treatment system was constructed on the Site and operated from 2002 to 2004. The treated groundwater was then discharged to the Las Vegas Wash under an NPDES permit [Ref. 8].
- In 2001, the groundwater barrier wall was installed (Ref. 8).

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- In 2004, construction was completed on the permanent on-site FBR perchlorate treatment system. Elements of the FBR system are housed within the New D-1 Building (LOU 58) [Ref. 2]. The interim ion-exchange system was taken off-line and water from the GW-11 pond currently flows into the FBR system. After perchlorate has been removed, the treated groundwater is discharged to Las Vegas Wash under the NPDES permit.
- Solid waste from the FBR perchlorate treatment system consists of filtered non-hazardous solid biomass. About one ton per day dry weight basis of solid waste is generated and is disposed of off-site at a landfill [Ref. 6].

<b>Process Waste Streams Associated with LOU 32</b>	<b>Known or Potential Constituents Associated with LOU 32</b>
Extracted Groundwater (pre-treatment)	<ul style="list-style-type: none"> <li>• Metals</li> <li>• Hexavalent chromium</li> <li>• Perchlorate</li> <li>• Wet chemistry analytes</li> </ul>
Metal oxides from the chromium treatment unit [Ref. 9].	<ul style="list-style-type: none"> <li>• Iron oxide</li> <li>• Total chromium</li> </ul>
Filter cake from the chromium treatment unit [Ref. 9].	<ul style="list-style-type: none"> <li>• Metals (Iron and total chromium)</li> </ul>
Filtered non-hazardous solid biomass containing negligible amounts of perchlorate from the perchlorate treatment unit [Ref. 9]	<ul style="list-style-type: none"> <li>• Perchlorate</li> </ul>

**Overlapping or Adjacent LOUs:** The following LOUs overlap or are adjacent to LOU 32:

Overlapping LOUs

- LOU 1 (Trade Effluent Settling Ponds) – Overlaps the northern half of LOU 32.
- LOU 58 (AP Plant Area New D-1 Building Washdown) – Overlaps the southwestern portion of LOU 32.
- LOU 55 (Area Affected by July 1990 Fire) – The northern portion of LOU 55 overlaps the southern portion of LOU 32.

Adjacent LOUs

- LOU 2 (Open Area Due South of “Trade Effluent Disposal Ponds”) – located southwest (upgradient) of LOU 32.

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- LOU 56 (AP Plant Area Old Building D-1- Washdown) – located south (upgradient) of LOU 32.

With the exception of LOUs 1 and 55 (see discussion below), known or potential chemical classes that are associated with LOUs 2, 56, and 58 are consistent with those listed for LOU 32; therefore, no additional chemical classes have been added to the analytical plan for LOU 32. For detailed information on the LOUs listed above, please refer to the specific LOU data package.

**LOUs Potentially Affecting Soils in LOU 32:**

- LOU 1: The former Trade Effluent Settling Ponds were located mostly within the footprint of LOU 32. These unlined ponds received wastes from the Acid Drain System (LOU 60); therefore soils in LOU 32 may potentially be impacted by LOU 1. As a result, the analytical plan for samples collected from LOU 32 will include analyses for VOCs, SVOCs, TPH, and OCPs.
- LOUs 56 and 58: Used for dry material handling, mixing, and blending of ammonium perchlorate (AP). The small amounts of AP that fell to the floor were swept up and the building was washed down on an infrequent basis. Wash-water could have potentially drained from LOU 58, potentially affecting the soils in LOU 32. Known or potential chemical classes associated with LOUs 56 and 58 are included as part of the Phase B Analytical Plan for LOU 32.
- LOU 55: This area was used to store 55-gallon drums containing AP. A fire occurred on July 18, 1990 and soil surrounding the pad was impacted with AP and decomposition products as the fire-fighting wash water drained off the pad. As a result, the analytical plan for samples collected from LOU 32 will include analyses for SVOCs.

For detailed information on these LOUs, please refer to the specific LOU data package.

**Known or Potential Chemical Classes:**

- Metals
- Hexavalent chromium
- Perchlorate
- Wet chemistry analytes
- VOCs (associated with LOU 1)
- SVOCs (associated with LOU 1 and 55)
- TPH (associated with LOU 1)
- Organochlorine pesticides (associated with LOU 1)

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**Known or Potential Release Mechanisms:**

- Potential impacts to surrounding soils from surface releases.
- Potential releases to surrounding soils from conveyance and process piping.
- Small quantities of iron oxide filter cake were observed on the soil surface adjacent to the south side of the pad [Ref. 5].
- A small quantity of iron oxide sludge was observed outside the bermed area on the soil north of the treatment unit. [Ref. 5].
- Surface releases associated with overflow of the recharge trenches. In 1994, the groundwater recharge trenches overflowed resulting in surface releases of groundwater [Ref. 8]. The volume of water flowing onto the ground as surface runoff is not known, but the groundwater contained perchlorate. In 1994, the state-of-the-art laboratory instrumentation was not sensitive enough to detect the perchlorate levels in the water.

**Results of Historical Sampling:**

- Iron oxide sludge and filter cake contains chromium; however, concentrations are below EP toxicity and TCLP limit levels [Ref. 5].
- Several downgradient and upgradient monitoring wells are tested for hexavalent chromium and perchlorate as part of periodic or routine groundwater monitoring program. Analytical results are summarized: LOU 32 Table 6 [Ref. 3].

**Did Historical Samples Address Potential Release?**

- No

**Summary of Phase A SAI:**

Soil:

- Borings SA19 and SA20 are located south (upgradient) of LOU 32 but were not specifically sampled to evaluate this LOU [Ref. 2].

Groundwater:

- Well M-55 is located within LOU 32; however, this well was not sampled specifically to evaluate LOU 32 [Ref. 2].
- Well I-AR are located south (upgradient) of LOU 32 but were not sampled specifically to evaluate this LOU [Ref. 2].

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Chemical classes detected in Phase A soil borings SA20 and SA19:

- Metals
- Perchlorate
- Wet chemistry analytes
- VOCs
- Organochlorine pesticides (SA20 only)
- Dioxins
- Radionuclides
- Asbestos (SA19 only)

As a result of the Phase A data, the Phase B analytical plan for samples collected from LOU 32 will be expanded to include analyses for dioxins/furans, radionuclides, and asbestos.

- Analytical results for soil and groundwater from the Phase A sampling event are summarized: LOU 32 Tables 1 through 5 and 7 through 21 (see attached) [Ref. 2].

**Are Phase A Sample Locations in “Worst Case” Areas?**

- No

**Is Phase B Investigation Recommended?**

- Yes

**Proposed Phase B Soil Investigation/Rationale:**

- The Phase B investigation of LOU 32 consists of collecting soil samples from 28 locations.
  - Fourteen (14) soil boring locations will be placed within the boundaries of LOU 32:
  - Five (5) soil boring locations will be drilled south (upgradient) of LOU 32.
  - Nine (9) soil boring locations will be drilled north (downgradient) or cross-gradient of LOU 32.
  - All 28 borings along with the analytical program to evaluate soil samples from LOU 32 are listed on **Table A – Soil Sampling and Analytical Plan for LOU 32.**
- 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 LOU 32, based on the known process waste streams.
  - Ten (10) of the 28 sample locations are judgmental locations and include soil borings SA74, SA75, SA76, SA79, SA134, SA189, SA82, SA201, SA202, and SA88.
- Random sample locations:
  - Designed to assess whether unknown constituents associated with LOU 32 are present.
  - Eighteen (18) of the 28 sample locations are randomly-placed locations and include soil borings RSAL5, RSAK5, RSAK6, RSAK7, RSAJ7, RSAJ6, RSAJ5, RSAI3, RSAL6 (located in Area II), RSAL4, RSAK4, RSAK8, RSAJ8, RSAI7, RSAI5, RSAI4, RSAJ3, RSAK3

**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:**

- The Phase B groundwater investigation of LOU 32 consists of collecting groundwater samples from 17 locations to evaluate local groundwater conditions and as part of the Site-wide evaluation of constituent trends in groundwater.
  - Eight (8) wells will be sampled within the boundaries of LOU 32. These wells are: I-B, M-69, M-79, M-83, M-84, M-55, M-78, M-61.
  - Three (3) wells south (upgradient) of LOU 32 will be sampled. These wells are M-65, M-67, and I-AR (located in Area II).



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- Six (6) wells north (downgradient or cross-gradient) of LOU 32 and will be sampled. These wells are: M-88, M-98, M-99, M-100, M-101, and MW-16.
- All 17 wells along with the analytical program to evaluate groundwater samples associated with LOU 32 are listed on **Table B – Groundwater Sampling and Analytical Plan for LOU 32.**

**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 eight (8) locations to evaluate area conditions for the presence of vapor-phase VOCs in the vadose zone.

- SG21 will be located independently to assess indoor air risk to Perchlorate Treatment Building.
- SG23 will be located adjacent to well M-55 to evaluate VOCs from a groundwater source as indicated by Phase A Well M55 (690 µg/L Chloroform/12+ µg/L TCE).
- SG24 is located to evaluate VOCs from a groundwater source as a companion for Phase B well M-99; also to provide area-wide coverage.
- SG52 is located to evaluate VOCs (270 µg/L Chlorobenzene; 93 µg/L Benzene) from a groundwater source as a companion for Phase B well MW-16.
- SG90 is located to evaluate VOCs from a groundwater source as indicated by Phase A well M-98 (810J µg/L Chloroform).
- SG91 is located to evaluate VOCs from a groundwater source as indicated by Phase A well M-100 (36 µg/L Chloroform).
- SG92 is located to provide area-wide coverage and to evaluate potential VOCs in groundwater; also as a companion to soil boring RSAJ5.

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- SG93 is located to provide area-wide coverage as a companion to well M-88.

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:**

- VOCs (EPA TO-15)

**References:**

1. ENSR, 2005, Conceptual Site Model, Kerr-McGee Facility, Henderson, Nevada, ENSR, Camarillo, California, 04020-023-130, February 2005 and August 2005.
2. ENSR, 2007a, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
3. ENSR, 2007b, Quarterly Performance Report for Remediation Systems, Tronox LLC, Henderson, Nevada, July-September 2007, November 2007.
4. Kerr-McGee Chemical Corporation, 1981 to 2003, Boring Logs M-1 to M-114 and I-A to I-Z-Volume I.
5. Kleinfelder, 1993, Environmental Conditions Assessment, Kerr-McGee Chemical Corporation, Henderson, Nevada Facility, April 15, 1993 (Final).
6. Tronox and ENSR, 2007, Semi-Annual Performance Report for Chromium and Perchlorate, Tronox LLC, Henderson, Nevada, July – December 2006, February 26, 2007.
7. Tronox, 2007, Keith Bailey, verbal communication, February 2007.
8. Tronox, 2008, Tom Reed, verbal communication, January 30, 2008.
9. Environmental Answers, Keith Bailey, electronic-mail communication, March 10, 2008.

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**LOU Map**



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**Sampling and Analytical Plans for LOU 32:**

- Table A – Soil Analytical Plan for LOU 32
- Table B – Groundwater Analytical Plan for LOU 32

**Table A**  
**Soil Sampling and Analytical Plan for LOU 32**  
Phase B Source Area Investigation Work Plan  
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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.	Formal-dehyde Titrant (EPA 8315A)	Asbestos EPA/540/R-97/028	Location Description and Characterized Area Rationale		
<b>Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 1 (I-3) and ending with the southeastern most grid (L-7).</b>																				
I-3	1, 32	RSAI3	RSIAI3-0.0	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		RSIAI3-0.5	0.5	X	X	X	X		X	X	X	X		X					
I-3	1, 32		RSIAI3-10	10	X	X	X	X		X	X	Hold	X	X						
I-3	1, 32		RSIAI3-20	20	X	X	X	X		X	X		X	X						
I-3	1, 32		RSIAI3-25	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					
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	RSIAI4-0.0	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		RSIAI4-0.5	0.5	X	X	X	X		X	X	X	X		X					
I-4	1, 32		RSIAI4-10	10	X	X	X	X		X	X	Hold	X	X						
I-4	1, 32		RSIAI4-20	20	X	X	X	X		X	X		X	X						
I-4	1, 32		RSIAI4-30	30	X	X	X	X		X	X		X	X						
I-5	1, 32	RSAI5	RSIAI5-0.0	0.0													X	Boring located on the north berm of the GW-11 Pond to evaluate LOU 32		
I-5	1, 32		RSIAI5-0.5	0.5	X	X	X	X		X	X	X	X		X					
I-5	1, 32		RSIAI5-10	10	X	X	X	X		X	X	Hold	X	X						
I-5	1, 32		RSIAI5-20	20	X	X	X	X		X	X		X	X						
I-5	1, 32		RSIAI5-30	30	X	X	X	X		X	X		X	X						
I-7	1, 22, 23, 32	RSAI7	RSIAI7-0.0	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		RSIAI7-0.5	0.5	X	X	X	X		X	X	X	X		X					
I-7	1, 22, 23, 32		RSIAI7-10	10	X	X	X	X		X	X	Hold	X	X						
I-7	1, 22, 23, 32		RSIAI7-20	20	X	X	X	X		X	X		X	X						
I-7	1, 22, 23, 32		RSIAI7-30	30	X	X	X	X		X	X		X	X						
J-3	1, 32	RSAJ3	RSIAJ3-0.0	0.0													X	Boring located to evaluate LOU 1 (former Trade Effluent Settling Ponds) and for general site coverage.		
J-3	1, 32		RSIAJ3-0.5	0.5	X	X	X	X		X	X	X	X		X					
J-3	1, 32		RSIAJ3-10	10	X	X	X	X		X	X	Hold	X	X						
J-3	1, 32		RSIAJ3-20	20	X	X	X	X		X	X		X	X						
J-3	1, 32		RSIAJ3-30	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					
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	RSIAJ5-0.0	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		RSIAJ5-0.5	0.5	X	X	X	X		X	X	X	X		X					
J-5	1, 22, 23, 32		RSIAJ5-10	10	X	X	X	X		X	X	Hold	X	X						
J-5	1, 22, 23, 32		RSIAJ5-20	20	X	X	X	X		X	X		X	X						
J-5	1, 22, 23, 32		RSIAJ5-25	25	X	X	X	X		X	X		X	X						
J-6	1, 22, 23, 32	RSAJ6	RSIAJ6-0.0	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		RSIAJ6-0.5	0.5	X	X	X	X		X	X	X	X		X					
J-6	1, 22, 23, 32		RSIAJ6-10	10	X	X	X	X		X	X	Hold	X	X						
J-6	1, 22, 23, 32		RSIAJ6-20	20	X	X	X	X		X	X		X	X						
J-6	1, 22, 23, 32		RSIAJ6-30	30	X	X	X	X		X	X		X	X						
J-7	1, 22, 23, 32	RSAJ7	RSIAJ7-0.0	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		RSIAJ7-0.5	0.5	X	X	X	X		X	X	X	X		X					
J-7	1, 22, 23, 32		RSIAJ7-10	10	X	X	X	X		X	X	Hold	X	X						
J-7	1, 22, 23, 32		RSIAJ7-20	20	X	X	X	X		X	X		X	X						
J-7	1, 22, 23, 32		RSIAJ7-30	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	X		X					
J-8	1, 32		SA79-10	10	X	X	X	X		X	X	Hold	X	X						
J-8	1, 32		SA79-20	20	X	X	X	X		X	X		X	X						
J-8	1, 32		SA79-25	25	X	X	X	X		X	X		X	X						
J-8	1, 22, 23, 32	RSAJ8	RSIAJ8-0.0	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		RSIAJ8-0.5	0.5	X	X	X	X		X	X	X	X		X					
J-8	1, 22, 23, 32		RSIAJ8-10	10	X	X	X	X		X	X	Hold	X	X						
J-8	1, 22, 23, 32		RSIAJ8-20	20	X	X	X	X		X	X		X	X						
J-8	1, 22, 23, 32		RSIAJ8-30	30	X	X	X	X		X	X		X	X						

**Table A**  
**Soil Sampling and Analytical Plan for LOU 32**  
Phase B Source Area Investigation Work Plan  
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		
<b>Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 1 (I-3) and ending with the southeastern most grid (L-7).</b>																				
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						
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-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	X	X					
L-3	2, 32, 60		SA82-10	10	X	X	X	X		X	X	Hold	X	X						
L-3	2, 32, 60		SA82-20	20	X	X	X	X		X	X		X	X						
L-3	2, 32, 60		SA82-30	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						

**Table A**  
**Soil Sampling and Analytical Plan for LOU 32**  
Phase B Source Area Investigation Work Plan  
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		
<b>Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 1 (I-3) and ending with the southeastern most grid (L-7).</b>																				
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						
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						
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-6	55	RSAL6	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-6	32, 58		RSAL5-0.5	0.5	X	X	X	X		X	X	X	X	X						
L-6	32, 58		RSAL5-10	10	X	X	X	X		X	X	Hold	X	X						
L-6	32, 58		RSAL5-20	20	X	X	X	X		X	X		X	X						
L-6	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						
L-7	22, 23		RSAL7-10	10	X	X	X	X		X	X	Hold	X	X						
L-7	32, 57		SA75-0.0	0															X	
L-7	32, 57		SA75-0.5	0.5	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						
L-7	22, 23		RSAL7-10	10	X	X	X	X		X	X	Hold	X	X						
L-7	32, 57		SA75-0.0	0															X	
L-7	32, 57		SA75-0.5	0.5	X	X	X	X		X	X		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						
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						
<b>Number of Borings:</b>		<b>30</b>																		
<b>Number of Samples:</b>					<b>116</b>	<b>116</b>	<b>116</b>	<b>108</b>	<b>0</b>	<b>112</b>	<b>116</b>	<b>28</b>	<b>108</b>	<b>116</b>	<b>32</b>	<b>0</b>	<b>32</b>			
<b>Notes:</b>																				
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 alpha spec reporting for Thorium-230/232, Uranium 234/235, Uranium-238, and beta spec for Radium-226/228 (per NDEP).																				
6. Dioxins/furans: 90% will be tested by immunoassay, 10% analyzed by HRGC/HRMS in the laboratory.																				



**Table B**  
**Groundwater Sampling and Analysis Plan for LOU 32**  
Phase B Source Area Investigation Area I Work Plan  
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	VOCs1 (EPA 8260)	Wet Chemistry2	OCPs3 (EPA 8081A)	SVOCs4 (EPA 8270C)	Radio-nuclides5	Rationale
<b>Wells are organized by grid location as shown on Plate A - Starting point is on the northwestern-most grid in Area 1 (I-4) and ending with the southeastern-most grid covering Area I (L-5).</b>													
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.
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.
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.
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-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.
<b>Number of Field Samples:</b>					<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	

**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-volatile organic compounds
- 5 Radionuclides consists of alpha spec reporting for Thorium-230/232, Uranium 234/235, Uranium-238, and beta spec for Radium-226/228 (per NDEP)

**Summary of Available Data for LOU 32 –  
Chromium and Perchlorate Groundwater Remediation Unit  
Tronox Facility – Henderson, Nevada**

**Soil and Groundwater Characterization Data**

**Summary of Available Data for LOU 32 –  
Chromium and Perchlorate Groundwater Remediation Unit  
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 Phase A data associated with these LOU specific analytes listed above.

**LOU 32 Table 1 - Soil Characterization Data - Wet Chemistry**

**LOU 32 Table 2 - Groundwater Characterization Data - Wet Chemistry**

**LOU 32 Table 3 - Soil Characterization Data - Dioxins and Dibenzofurans**

**LOU 32 Table 4 - Soil Characterization Data - Metals**

**LOU 32 Table 5 - Groundwater Characterization Data - Metals**

LOU 32 Table 6 - Groundwater Characterization Data - Routine Monitoring

**LOU 32 Table 7 - Soil Characterization Data - Organochlorine Pesticides (OCP)**

**LOU 32 Table 8 - Groundwater Characterization Data - Organochlorine Pesticides (OCP)**

LOU 32 Table 9 - Soil Characterization Data - Organophosphorus Pesticides (OPPs)

LOU 32 Table 10 - Groundwater Characterization Data - Organophosphorus Pesticides (OPPs)

LOU 32 Table 11 - Soil Characterization Data - PCBs

LOU 32 Table 12 - Groundwater Characterization Data - PCBs

**LOU 32 Table 13 - Soil Characterization Data - Perchlorate**

**LOU 32 Table 14 - Groundwater Characterization Data - Perchlorate**

**LOU 32 Table 15 - Soil Characterization Data - Radionuclides**

**LOU 32 Table 16 - Groundwater Characterization Data - Radionuclides**

**LOU 32 Table 17 - Soil Characterization Data - SVOC**

**LOU 32 Table 18 - Groundwater Characterization Data - SVOC**

**LOU 32 Table 19 - Soil Characterization Data - VOCs**

**LOU 32 Table 20 - Groundwater Characteristic Data - VOCs**

**LOU 32 Table 21 - Soil Characterization Data - Long Asbestos Fibers in Respirable Soil Fraction**

Notes for all tables presented at the end of the tables.

**LOU 32 Table 1  
Soil Characterization Data - Wet Chemistry**

Groundwater Remediation Unit  
Tronox Facility - Henderson, Nevada

Sampling Program	Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	
Boring No.	SA19	SA19	SA19	SA19	SA20	SA20	SA20	SA20	SA20	SA20	
Sample ID	SA19-0.5	SA19-10	SA19-20	SA19-25	SA20-0.5	SA20-0.5D	SA20-10	SA20-20	SA20-25		
Sample Depth (ft)	0.5	10	20	25	0.5	0.5	10	20	25		
Sample Date	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	
Wet Chemistry Parameter	PRG <sup>2</sup> mg/kg										Units
Percent moisture	--	9.4	8.5	8.8	13.9	10.1	19.5	15.8	5.2	15.5	percent
Alkalinity (as CaCO <sub>3</sub> )	--	55.2 U	97.2	54.8 U	58.1 U	133	177	97.6	52.8 U	59.2 U	mg/kg
Bicarbonate	--	184	486	583	181	714	1120	277	229	265	mg/kg
Total Alkalinity	--	196	583	606	219	847	1300	374	240	265	mg/kg
Ammonia (as N)	--	5.5 UJ	5.5 UJ	5.5 UJ	5.8 UJ	5.6 UJ	6.2 UJ	5.9 UJ	5.3 UJ	5.9 UJ	mg/kg
Cyanide	1.20E+04	R	R	R	R	R	R	R	R	R	mg/kg
MBAS	--	4.7 U	4.5 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	3.3 J	3.1 J	mg/kg
pH (solid)	--	8.1	8.8	8.2	8.0	9.4	9.3	8.8	8.7	7.9	none
Bromide	--	2.8 UJ	2.7 UJ	2.7 UJ	2.9 UJ	2.8 UJ	3.1 UJ	3.0 UJ	2.6 UJ	3.0 UJ	mg/kg
Chlorate	--	18.4 J-	5.5 UJ	5.5 UJ	5.8 UJ	5.6 UJ	6.2 UJ	5.9 UJ	1.8 J-	4.3 J-	mg/kg
Chloride	--	11.8 J-	6.1 J-	3.8 J-	8.5 J-	1.5 J-	4.8 J-	3.4 J-	283 J-	382 J-	mg/kg
Nitrate (as N)	--	61.8 J+	4.9 J+	10.3 J+	1.0 J+	0.53 J+	0.25 U	1.1 J+	4.6 J+	6.3 J+	mg/kg
Nitrite	--	0.31 J-	0.33 J-	0.78 J-	0.23 UJ	0.95 J-	0.25 UJ	0.30 J-	2.1 UJ	2.4 UJ	mg/kg
ortho-Phosphate	--	55.2 U	5.5 U	5.5 U	5.8 U	5.6 UJ	6.2 U	5.9 U	5.3 U	4.1 J	mg/kg
Sulfate	--	16.4 J+	22.1 J+	8160	961	19.7 J+	27.3 J+	325	1810	12000	mg/kg
Total Organic Carbon	--	8000 J-	11100 J-	4200 J-	6300 J-	11700 J	2100 J	7500 J	1100 J	1400 J	mg/kg

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004).

**LOU 32 Table 2**  
**Groundwater Characterization Data - Wet Chemistry**

Groundwater Remediation Unit  
Tronox Facility - Henderson, Nevada

<b>Sampling Program</b>		Ph A <sup>1</sup>	Ph A	
<b>Well ID</b>		IAR	M55	
<b>Sample ID</b>		IAR	M55	
<b>Sample Date</b>		12/01/2006	12/07/2006	
<b>Wet Chemistry Parameters</b>	<b>MCL<sup>2</sup> ug/L</b>			<b>Units</b>
Total Dissolved Solids	5.00E+05 j	<b>7870</b>	<b>9560</b>	mg/L
Total Suspended Solids	--	<b>18 J</b>	<b>6.0 J</b>	mg/L
Alkalinity (as CaCO3)	--	5.0 U	5.0 U	mg/L
Bicarbonate	--	<b>172 J+</b>	<b>156</b>	mg/L
Total Alkalinity	--	<b>172 J</b>	<b>156</b>	mg/L
Ammonia (as N)	--	<b>507000</b>	<b>2630</b>	ug/L
MBAS	--	<b>2.3</b>	<b>3.3</b>	mg/L
Cyanide	2.00E+02	R	R	ug/L
pH (liquid)	--	<b>7.4 J</b>	<b>7.1 J</b>	none
Specific Conductance	--	<b>4470</b>	<b>3000 J+</b>	umhos/cm
Bromide	--	25.0 U	2.5 U	mg/L
Chlorate	--	<b>46.8</b>	<b>3340</b>	mg/L
Chloride	2.50E+05	<b>518</b>	<b>2030</b>	mg/L
Nitrate (as N)	1.00E+04	<b>283</b>	<b>28.8</b>	mg/L
Nitrite	1.00E+03	<b>138</b>	0.20 U	mg/L
ortho-Phosphate	--	5.0 U	500 U	mg/L
Sulfate	2.50E+05 j	<b>1250</b>	<b>1210</b>	mg/L
Total Organic Carbon	--	50.0 U	50.0 U	mg/L

**Notes:**

2. U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004).
2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
- (j) Secondary Drinking Water Regulation value.

**LOU 32 Table 3**  
**Soil Characterization Data - Dioxins and Dibenzofurans**

Groundwater Remediation Unit  
Tronox Facility - Henderson, Nevada

Sampling Program				Ph A <sup>1</sup>	Ph A	Ph A
Boring No.				SA19	SA20	SA20
Sample ID				SA19-0.5	SA20-0.5	SA20-0.5D
Sample Depth (ft)				0.5	0.5	0.5
Sample Date				11/16/2006	11/16/2006	11/16/2006
chemical_name:	Method	Unit	PRG <sup>2</sup> mg/kg			
Dioxin 8290 SCREEN Total TEQ-ENSR Calculated (a) ng/kg		ng/kg	--	<b>288</b>	<b>0.24</b>	
Dioxin SW 846 8290 Total TEQ-ENSR Calculated (a) ng/kg		ng/kg	--	<b>268</b>		
Dioxin 8290 SCREEN Total TEQ-ENSR Calculated (b) ng/kg		ng/kg	--	<b>288</b>	<b>0.31</b>	
Dioxin SW 846 8290 Total TEQ-ENSR Calculated (b) ng/kg		ng/kg	--	<b>268</b>		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	8290 Screen	ng/kg	--	<b>1676.277</b>	<b>1.328</b>	<b>0.543</b>
1,2,3,4,6,7,8-Heptachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>1580.034 J</b>		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>145.429</b>	<b>1.317</b>	<b>0.910</b>
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	<b>145.429</b>		
1,2,3,4,7,8,9-Heptachlorodibenzofuran	8290 Screen	ng/kg	--	<b>779.803</b>	<b>0.805</b>	0.071 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>831.444 J</b>		
1,2,3,4,7,8-Hexachlorodibenzofuran	8290 Screen	ng/kg	--	<b>669.437</b>	<b>0.535</b>	<b>0.172</b>
1,2,3,4,7,8-Hexachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>652.232 J</b>		
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>17.947</b>	<b>0.211</b>	0.056 U
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	<b>17.947</b>		
1,2,3,6,7,8-Hexachlorodibenzofuran	8290 Screen	ng/kg	--	<b>425.764</b>	<b>0.442</b>	<b>0.095</b>
1,2,3,6,7,8-Hexachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>425.762</b>		
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>32.612</b>	<b>0.338</b>	0.050 U
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	<b>32.612</b>		
1,2,3,7,8,9-Hexachlorodibenzofuran	8290 Screen	ng/kg	--	<b>52.982</b>	<b>0.345</b>	0.053 U
2. U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004).	SW 846 8290	ng/kg	--	<b>52.981</b>		
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>37.309</b>	<b>0.351</b>	0.052 U
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	<b>37.309</b>		
1,2,3,7,8-Pentachlorodibenzofuran	8290 Screen	ng/kg	--	<b>314.427</b>	<b>0.143</b>	0.054 U
1,2,3,7,8-Pentachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>314.428</b>		
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>24.099</b>	<b>0.086</b>	0.074 U
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	<b>24.099</b>		
2,3,4,6,7,8-Hexachlorodibenzofuran	8290 Screen	ng/kg	--	<b>216.800</b>	<b>0.361</b>	0.047 U
2,3,4,6,7,8-Hexachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>216.799</b>		
2,3,4,7,8-Pentachlorodibenzofuran	8290 Screen	ng/kg	--	<b>128.464</b>	<b>0.089</b>	0.050 U
2,3,4,7,8-Pentachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>128.463</b>		
2,3,7,8-Tetrachlorodibenzofuran	8290 Screen	ng/kg	--	<b>357.802</b>	<b>0.220</b>	0.080 U
2,3,7,8-Tetrachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>181.098 J</b>		
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	1.00E+04 h,v	<b>7.426</b>	0.078 U	0.082 U
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	1.00E+04 h,v	<b>7.426</b>		
Octachlorodibenzofuran	8290 Screen	ng/kg	--	<b>4873.315</b>	<b>3.376</b>	<b>1.398</b>
Octachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>4379.503 J</b>		
Octachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>157.307</b>	<b>7.056</b>	<b>6.993</b>
Octachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	157.306 U		
Tetrachlorinated Dibenzofurans, (Total)	SW 846 8290	ng/kg	--	<b>2089.117 J</b>		
Total HpCDD	SW 846 8290	ng/kg	--	<b>228.544</b>		
Total HpCDF	SW 846 8290	ng/kg	--	<b>3521.881 J</b>		
Total HxCDD	SW 846 8290	ng/kg	--	<b>260.194</b>		
Total HxCDF	SW 846 8290	ng/kg	--	<b>2886.323 J</b>		
Total PeCDD	SW 846 8290	ng/kg	--	<b>229.389</b>		
Total PeCDF	SW 846 8290	ng/kg	--	<b>2623.048</b>		
Total TCDD	SW 846 8290	ng/kg	--	<b>205.418</b>		

Notes:

- ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004).
  - 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.
- Dioxins and furans were expressed as 2,3,7,8- TCDD TEQ (toxic equivalents), calculated using the TEFs (Toxic Equivalency Factors) published by Van den Berg et al., 2006.
- USEPA, 1998. Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites. OSWER Directive 9200.4-26. April, 1998. Midpoint of the range of 0.005 to 0.02 mg/kg for commercial/industrial soils.

**LOU 32 Table 4  
Soil Characterization Data - Metals**

Groundwater Remediation Unit  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	
Boring No.		SA19	SA19	SA19	SA19	SA20	SA20	SA20	SA20	SA20	
Sample ID		SA19-0.5	SA19-10	SA19-20	SA19-25	SA20-0.5	SA20-0.5D	SA20-10	SA20-20	SA20-25	
Sample Depth (ft)		0.5	10	20	25	0.5	0.5	10	20	25	
Sample Date		11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	
Metals	PRG <sup>2</sup> mg/kg										Units
Aluminum	9.21E+05 (oo)	7090	6620	6020	6280	8090	9460	7230	4170	4710	mg/kg
Antimony	4.09E+02	0.17 J-	0.15 J-	0.16 J-	0.12 J-	0.19 J-	0.23 J-	0.16 J-	0.13 J-	0.14 J-	mg/kg
Arsenic	1.59E+00	2.2	3.9	14.7	16.0	2.7	3.1	2.3	8.8	14.1	mg/kg
Barium	6.66E+04	150 J	145 J	131 J	105	176	221	149 J	129 J	107 J	mg/kg
Beryllium	1.94E+03	0.46	0.44	0.38	0.33	0.53	0.62	0.49	0.30	0.28	mg/kg
Boron	2.00E+05 (oo)	2.8 J-	4.1 J-	10.2 J-	10.0 J	4.7 J	7.7 J	5.5 J-	6.0 J-	9.7 J-	mg/kg
Cadmium	4.50E+02	0.094	0.065	0.073	0.073	0.091	0.12	0.091	0.086	0.049 J	mg/kg
Calcium	--	15000	25900	25200	44000	16600	21900	14900	37600	15200	mg/kg
Chromium (Total)	4.48E+02	10.3 J-	8.4 J-	9.3 J-	14.0	10.7 J-	12.6 J-	9.3 J-	8.5 J-	9.6 J-	mg/kg
Chromium-hexavalent	6.40E+01	0.22 U	9.0	0.11 J	0.18 J	0.22 U	0.25 U	0.24 U	0.72	0.29	mg/kg
Cobalt	1.92E+03	6.2 J-	5.0 J-	3.3 J-	3.3	6.5	8.2	6.1 J-	2.5 J-	3.2 J-	mg/kg
Copper	4.09E+04	12.4 J-	10.7 J-	7.1 J-	6.9 J-	12.0 J-	14.1 J-	11.6 J-	5.8 J-	7.2 J-	mg/kg
Iron	3.00E+05 (oo)	11800	9700	6940	7120	12100	14300	10300	4890	6620	mg/kg
Lead	8.00E+02	9.0	6.8	5.3	5.2	9.7	11.9	8.2	4.9	5.5	mg/kg
Magnesium	--	6680 J-	9230 J-	7870 J-	18600	7500 J-	8460 J-	6390 J-	4590 J-	6080 J-	mg/kg
Manganese	1.95E+04	275	180	148	154	304	396	334	102	116	mg/kg
Molybdenum	5.11E+03	0.45 J	0.41 J	0.44 J	0.66	0.47 J	0.61 J	0.40 J	0.37 J	0.50 J	mg/kg
Nickel	2.04E+04	12.7 J-	11.0 J-	8.6 J-	8.6 J-	13.4 J-	15.6 J-	11.5 J-	7.6 J-	11.0 J-	mg/kg
Platinum	--	0.013 J	0.013 J	0.012 J	0.012 U	0.014 J	0.019 J	0.012 U	0.011 U	0.012 U	mg/kg
2. U.S. EPA, Region 9, Pr	--	1900	1630	1970	1780	2470	2910	2260	1170	1390	mg/kg
Selenium	5.11E+03	0.12 U	0.12 U	0.12 U	0.13 U	0.12 U	0.13 U	0.13 U	0.11 U	0.13 U	mg/kg
Silver	5.11E+03	0.14 J	0.12 J	0.11 J	0.11 J	0.15 J	0.17 J	0.29	0.068 J	0.081 J	mg/kg
Sodium	--	214 J-	302 J-	324 J-	466	362	420	298 J-	625 J-	603 J-	mg/kg
Strontium	6.12E+05 (oo)	84.3 J	160 J	739 J	178 J-	121	141	102 J	852 J	639 J	mg/kg
Thallium	6.75E+01	0.098 J	0.077 J	0.082 J	0.081 U	0.12 J	0.25 J	0.14 J	0.077 J	0.083 U	mg/kg
Tin	6.12E+05 (oo)	0.51	0.47	0.39	0.38	0.51	0.67	0.43	0.32	0.34	mg/kg
Titanium	3.80E+06 (oo)	529 J+	464 J+	326 J+	366 J+	507	572	403 J+	252 J+	318 J+	mg/kg
Tungsten	--	0.24 J-	0.28 J-	0.56 J-	0.36 J-	0.33 J-	0.47 J-	0.32 J-	0.24 J-	0.42 J-	mg/kg
Uranium	2.04E+02	0.85	1.4	2.5	2.3	0.81	0.97	0.70	1.4	1.7	mg/kg
Vanadium	1.02E+03	30.9 J-	30.5 J-	30.5 J-	22.7	30.5 J-	34.8 J-	23.4 J-	18.0 J-	35.2 J-	mg/kg
Zinc	3.10E+05 (oo)	24.9 J-	21.6 J-	17.9 UJ	16.6 UJ	26.8 J-	30.4 J-	22.8 J-	13.3 UJ	15.8 UJ	mg/kg
Mercury	3.10E+02 (t)	0.010 U	0.0073 UJ	0.0095 U	0.0078 UJ	0.046 U	0.028 U	0.0079 UJ	0.0071 UJ	0.0079 UJ	mg/kg

**Notes:**

- ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
- U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004).  
(oo) PRG is based on maximum (1E+05 mg/kg). Therefore, the risk-based value provided in the electronic backup to the PRG table was used.  
(t) Value for mercury and compounds.

**LOU 32 Table 5  
Groundwater Characterization Data - Metals**

Groundwater Remediation Unit  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	
Well ID:		IAR	M55	
Sample ID		IAR-Z	M55-Z	
Sample Date		05/08/2007	05/08/2007	
Metals	MCL <sup>2</sup> ug/L			Unit
Aluminum	5.00E+01 j	7.9 U	393 U	ug/L
Antimony	6.00E+00	1.1	25.0 U	ug/L
Arsenic	1.00E+01	110	128 J	ug/L
Barium	2.00E+03	36.3	46.5 J	ug/L
Beryllium	4.00E+00	1.8 U	4.4 U	ug/L
Boron	7.30E+03 c	2980	9980	ug/L
Cadmium	5.00E+00	0.10 J	2.9 U	ug/L
Calcium	--	540000	578000	ug/L
Chromium (Total)	1.00E+02	291 J-	12600 J-	ug/L
Chromium-hexavalent	1.09E+02 c	302 J	14300 J	ug/L
Cobalt	7.30E+02 c	0.94 J-	15.7 UJ	ug/L
Copper	1.30E+03 p	2.7 U	12.5 U	ug/L
Iron	3.00E+02 j	188 UJ	470 UJ	ug/L
Lead	1.50E+01 u	0.49 U	24.6 U	ug/L
Magnesium	1.50E+05 a	248000	340000	ug/L
Manganese	5.00E+01 j	29.8 U	34.9 U	ug/L
Molybdenum	1.82E+02 c	26.8	25.0 U	ug/L
Nickel	7.30E+02 c	10.3 UJ	25.8 UJ	ug/L
Platinum	--	1.1	5.0 U	ug/L
Potassium	--	34800	48100	ug/L
2. U.S. EPA, Region 9, P	5.00E+01	1.0 U	50.0 U	ug/L
Silver	1.00E+02 j	0.20 U	10.1 U	ug/L
Sodium	--	918000	1780000	ug/L
Strontium	2.19E+04 c	8820	16100	ug/L
Thallium	2.00E+00	0.71 U	16.0 U	ug/L
Tin	2.19E+04 c	0.20 U	10.0 U	ug/L
Titanium	1.46E+05 c	4.2 U	19.6 U	ug/L
Tungsten	--	0.82 UJ	25.0 UJ	ug/L
Uranium	3.00E+01	37.5 J+	49.1 J+	ug/L
Vanadium	3.65E+01 c	32.0 U	80.0 UJ	ug/L
Zinc	5.00E+03 j	40.2 UJ	50.0 UJ	ug/L
Mercury	2.00E+00	0.093 U	0.11 J+	ug/L

**Notes:**

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.
  - (c) Equal to the USEPA Region 9 Preliminary Remediation Goals (PRGs) for tapwater (October, 2004).
  - (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.



LOU 32 Table 6  
Groundwater Characterization Data - Routine Monitoring

Groundwater Remediation Unit  
Tronox LLC, Henderson, Nevada

Well ID	Date	Depth to water (ft)	Perchlorate mg/l	Qual	MCL <sup>1</sup> ug/L	Total Chromium mg/l	Qual	MCL <sup>1</sup> ug/L	TDS mg/l	Qual	MCL <sup>1</sup> ug/L	MCL <sup>1</sup> ug/L	MCL <sup>1</sup> ug/L
M-61	5/3/2006	22.72	73	d	1.80E+01	a,m	1.2	d	1.00E+02	3940	5.00E+05	1.00E+04	--
M-61	5/7/2006	36.86	92	d	1.80E+01	a,m				5680	5.00E+05	1.00E+04	--
M-61	5/7/2006	36.86	89	d	1.80E+01	a,m				5900	5.00E+05	1.00E+04	--
M-61	8/3/2006	23.88	71.6	d	1.80E+01	a,m	1.1	d		4540	5.00E+05	1.00E+04	--
M-61	11/1/2006	24.78	72.7	d	1.80E+01	a,m	1.1	d		5370	5.00E+05	1.00E+04	--
M-61	1/31/2007	24.16	60.8		1.80E+01	a,m	1			5410	5.00E+05	1.00E+04	--
M-61	5/3/2007	24.00	72		1.80E+01	a,m	1.2	d		5680	5.00E+05	1.00E+04	--
M-61	8/1/2007	24.64	81		1.80E+01	a,m	1			5500	5.00E+05	1.00E+04	--
M-64	1/31/2006	25.63	1000	d	1.80E+01	a,m	8	d			5.00E+05	1.00E+04	--
M-64	5/2/2006	25.63	990	d	1.80E+01	a,m	7.3	d		6090	5.00E+05	1.00E+04	--
M-64	8/1/2006	26.75	846	d	1.80E+01	a,m	8.2	d		7040	5.00E+05	1.00E+04	--
M-64	10/31/2006	27.04	737	d	1.80E+01	a,m	6.4	d		6290	5.00E+05	1.00E+04	--
M-64	1/30/2007	27.63	997		1.80E+01	a,m	8.8			8550	5.00E+05	1.00E+04	--
M-64	5/4/2007	28.89	709		1.80E+01	a,m	7.2			7900	5.00E+05	1.00E+04	--
M-64	7/31/2007	29.27	821		1.80E+01	a,m	8.2			8170	5.00E+05	1.00E+04	--
M-65	1/31/2006	27.75	1400	d	1.80E+01	a,m	36	d			5.00E+05	1.00E+04	--
M-65	5/2/2006	28.07	1500	d	1.80E+01	a,m	30	d		11300	5.00E+05	1.00E+04	--
M-65	8/1/2006	28.77	1260	d	1.80E+01	a,m	32	d		14100	5.00E+05	1.00E+04	--
M-65	10/31/2006	29.03	1340	d	1.80E+01	a,m	34			18000	5.00E+05	1.00E+04	--
M-65	1/30/2007	29.52	1330		1.80E+01	a,m	34			16600	5.00E+05	1.00E+04	--
M-65	5/4/2007	30.43	1250		1.80E+01	a,m	33			14700	5.00E+05	1.00E+04	--
M-65	7/31/2007	30.96	1460		1.80E+01	a,m	33			18700	5.00E+05	1.00E+04	--
M-67	2/2/2006	20.31	540	d	1.80E+01	a,m	5	d			5.00E+05	1.00E+04	--
M-67	5/3/2006	20.57	420	d	1.80E+01	a,m	4.8	d		5090	5.00E+05	1.00E+04	--
mediation Goals (P	5/7/2006	24.23	420	d	1.80E+01	a,m				7580	5.00E+05	1.00E+04	--
M-67	8/3/2006	21.33	485	d	1.80E+01	a,m	5	d		5270	5.00E+05	1.00E+04	--
M-67	11/1/2006	22.85	483	d	1.80E+01	a,m	5.3	d		7200	5.00E+05	1.00E+04	--
M-67	1/31/2007	21.79	500		1.80E+01	a,m	5.6			7730	5.00E+05	1.00E+04	--
M-67	5/4/2007	21.65	485		1.80E+01	a,m	5.5			8140	5.00E+05	1.00E+04	--
M-67	8/1/2007	22.26	582		1.80E+01	a,m	5.5			7790	5.00E+05	1.00E+04	--
M-68	2/2/2006	23.22	42	d	1.80E+01	a,m	0.73	d			5.00E+05	1.00E+04	--
M-68	5/3/2006	22.86	30	d	1.80E+01	a,m	0.68	d		4190	5.00E+05	1.00E+04	--
M-68	8/2/2006	24.11	28.9	d	1.80E+01	a,m	0.71	d		4510	5.00E+05	1.00E+04	--
M-68	11/1/2006	25.61	31.2	d	1.80E+01	a,m	0.72	d		5650	5.00E+05	1.00E+04	--
M-68	1/31/2007	24.58	24.6		1.80E+01	a,m	0.66			5680	5.00E+05	1.00E+04	--
M-68	5/3/2007	24.52	35.4	J	1.80E+01	a,m	0.77			5610	J 5.00E+05	1.00E+04	--
M-68	8/1/2007	25.12	61		1.80E+01	a,m	0.91			6350	5.00E+05	1.00E+04	--
CLD-2R	5/9/2007	33.24	4.01		1.80E+01	a,m	0.48			17600	5.00E+05	1.00E+04	--
M-57A	1/31/2006	28.86	22	d	1.80E+01	a,m	0.077	d			5.00E+05	1.00E+04	--
M-57A	5/2/2006	28.94	24	d	1.80E+01	a,m	0.065	d		2230	5.00E+05	1.00E+04	--
M-57A	8/1/2006	29.29	21	d	1.80E+01	a,m	0.073	d		2660	5.00E+05	1.00E+04	--
M-57A	10/31/2006	29.16	20.8	d	1.80E+01	a,m	0.084	d		3030	5.00E+05	1.00E+04	--
M-57A	1/30/2007	29.43	20.3		1.80E+01	a,m	0.087			3040	5.00E+05	1.00E+04	--

LOU 32 Table 6 (continued)  
Groundwater Characterization Data - Routine Monitoring

Groundwater Remediation Unit  
Tronox LLC, Henderson, Nevada

Well ID	Date	Depth to water (ft)	Perchlorate mg/l	Qual	MCL <sup>1</sup> ug/L	Total Chromium mg/l	Qual	MCL <sup>1</sup> ug/L	TDS mg/l	Qual	MCL <sup>1</sup> ug/L	MCL <sup>1</sup> ug/L	MCL <sup>1</sup> ug/L
M-57A	5/1/2007	29.64	20.4		1.80E+01	a,m		0.081	3180		5.00E+05	1.00E+04	--
M-57A	7/31/2007	30.02	23.9		1.80E+01	a,m		0.083	3060		5.00E+05	1.00E+04	--
M-79	1/31/2006	25.37	20	d	1.80E+01	a,m		0.058			5.00E+05	1.00E+04	--
M-79	5/2/2006	25.13	23	d	1.80E+01	a,m		0.054	1520		5.00E+05	1.00E+04	--
M-79	8/1/2006	28.20	11.5	d	1.80E+01	a,m		0.044	1110		5.00E+05	1.00E+04	--
M-79	10/31/2006	26.25	12.8	d	1.80E+01	a,m		0.043	1350		5.00E+05	1.00E+04	--
M-79	1/30/2007	26.70	7.2		1.80E+01	a,m		0.028	1040		5.00E+05	1.00E+04	--
M-79	5/1/2007	27.59	14.7		1.80E+01	a,m		0.044	1320		5.00E+05	1.00E+04	--
M-79	7/31/2007	29.20	134		1.80E+01	a,m		0.5	2350		5.00E+05	1.00E+04	--
I-B	1/31/2006	30.61	2100	d	1.80E+01	a,m		0.33			5.00E+05	1.00E+04	--
I-B	5/2/2006	30.40	3000	d	1.80E+01	a,m		0.38	5740		5.00E+05	1.00E+04	--
I-B	8/1/2006	31.18	2270	d	1.80E+01	a,m		0.26	5980		5.00E+05	1.00E+04	--
I-B	10/31/2006	32.91	1720	d	1.80E+01	a,m		0.14	5860		5.00E+05	1.00E+04	--
I-B	1/30/2007	34.29	1280		1.80E+01	a,m		0.15	5230		5.00E+05	1.00E+04	--
I-B	5/1/2007	35.51	900		1.80E+01	a,m		0.15	5120		5.00E+05	1.00E+04	--
I-B	7/31/2007	36.22	1150		1.80E+01	a,m		0.22	4930		5.00E+05	1.00E+04	--
I-L	1/31/2006	28.33	1700	d	1.80E+01	a,m		1.3			5.00E+05	1.00E+04	--
I-L	5/2/2006	27.39	1500	d	1.80E+01	a,m		1.1	6650		5.00E+05	1.00E+04	--
I-L	8/1/2006	29.68	1200	d	1.80E+01	a,m		1	5560		5.00E+05	1.00E+04	--
I-L	10/31/2006	30.82	1940	d	1.80E+01	a,m		0.77	6680		5.00E+05	1.00E+04	--
I-L	1/30/2007	35.67	1900		1.80E+01	a,m		0.66	6820		5.00E+05	1.00E+04	--
I-L	5/1/2007	35.23	1780		1.80E+01	a,m		0.67	6850		5.00E+05	1.00E+04	--
I-L	7/31/2007	32.02	2160		1.80E+01	a,m		0.8	6740		5.00E+05	1.00E+04	--
M-83	1/11/2006	22.61	45	d	1.80E+01	a,m					5.00E+05	1.00E+04	--
M-83	2/2/2006	22.95	38	d	1.80E+01	a,m		0.27			5.00E+05	1.00E+04	--
M-83	2/8/2006	22.95	22	d	1.80E+01	a,m		0.17			5.00E+05	1.00E+04	--
M-83	3/8/2006	22.43	26	d	1.80E+01	a,m					5.00E+05	1.00E+04	--
M-83	4/12/2006	22.36	12.8	d	1.80E+01	a,m					5.00E+05	1.00E+04	--
M-83	5/4/2006	22.54	30	d	1.80E+01	a,m		0.21	1320		5.00E+05	1.00E+04	--
M-83	5/10/2006	22.54	13.4	d	1.80E+01	a,m		0.094			5.00E+05	1.00E+04	--
M-83	6/13/2006	22.79	241	d	1.80E+01	a,m					5.00E+05	1.00E+04	--
M-83	7/13/2006	22.85	8.43	d	1.80E+01	a,m					5.00E+05	1.00E+04	--
M-83	8/3/2006	22.75	7.68	d	1.80E+01	a,m		0.08	890		5.00E+05	1.00E+04	--
M-83	8/9/2006	22.75	344	d	1.80E+01	a,m		2	3340		5.00E+05	1.00E+04	--
M-83	9/13/2006	23.69	14.9	d	1.80E+01	a,m			1370		5.00E+05	1.00E+04	--
M-83	10/12/2006	23.63	7.53	d	1.80E+01	a,m			1360		5.00E+05	1.00E+04	--
M-83	11/2/2006	23.18	26.9	d	1.80E+01	a,m		0.17	1600		5.00E+05	1.00E+04	--
M-83	11/9/2006	23.18	295	d	1.80E+01	a,m		1.5	3620		5.00E+05	1.00E+04	--
M-83	12/12/2006	24.11	8.14	d	1.80E+01	a,m			1280		5.00E+05	1.00E+04	--
M-83	1/10/2007	24.31	6.47		1.80E+01	a,m			1160		5.00E+05	1.00E+04	--
M-83	2/1/2007	24.18	11.8		1.80E+01	a,m		0.1	1310		5.00E+05	1.00E+04	--
M-83	2/8/2007	24.18	6.63		1.80E+01	a,m		0.063	1390		5.00E+05	1.00E+04	--
M-83	3/15/2007	24.04	5.83		1.80E+01	a,m			1430		5.00E+05	1.00E+04	--
M-83	4/12/2007	24.88	5.48		1.80E+01	a,m			1090		5.00E+05	1.00E+04	--

**LOU 32 Table 6 (continued)**  
**Groundwater Characterization Data - Routine Monitoring**

Groundwater Remediation Unit  
 Tronox LLC, Henderson, Nevada

Well ID	Date	Depth to water (ft)	Perchlorate mg/l	Qual	MCL <sup>1</sup> ug/L	Total Chromium mg/l	Qual	MCL <sup>1</sup> ug/L	TDS mg/l	Qual	MCL <sup>1</sup> ug/L	MCL <sup>1</sup> ug/L	MCL <sup>1</sup> ug/L
M-83	5/3/2007	25.95	7.07	J	1.80E+01	a,m	0.034		1040	J	5.00E+05	1.00E+04	--
M-83	5/10/2007	25.95	265		1.80E+01	a,m	1.5		3150		5.00E+05	1.00E+04	--
M-83	6/14/2007	27.37	19		1.80E+01	a,m			1270		5.00E+05	1.00E+04	--
M-83	7/13/2007	27.73	24.5		1.80E+01	a,m			1160		5.00E+05	1.00E+04	--
M-83	8/3/2007	28.02	9.53		1.80E+01	a,m	0.093		996		5.00E+05	1.00E+04	--
M-83	8/16/2007	28.02	15.7		1.80E+01	a,m	0.15		1070		5.00E+05	1.00E+04	--
M-83	9/14/2007	28.62	28.2		1.80E+01	a,m			1130		5.00E+05	1.00E+04	--
M-84	2/2/2006	22.57	6	d	1.80E+01	a,m	0.053	d	1760		5.00E+05	1.00E+04	--
M-84	5/4/2006	21.99	17	d	1.80E+01	a,m	0.034	d			5.00E+05	1.00E+04	--
M-84	8/3/2006	22.11	1.71	d	1.80E+01	a,m	<0.01	ud	1420		5.00E+05	1.00E+04	--
M-84	11/2/2006	22.50	1.1	d	1.80E+01	a,m	<0.01	ud	1130		5.00E+05	1.00E+04	--
M-84	2/1/2007	23.40	5.32		1.80E+01	a,m	0.045		978		5.00E+05	1.00E+04	--
M-84	5/3/2007	25.21	4.1	J	1.80E+01	a,m	0.042		1250	J	5.00E+05	1.00E+04	--
M-84	8/2/2007	27.44	9.31		1.80E+01	a,m	0.08	J	994		5.00E+05	1.00E+04	--
M-88	2/2/2006	29.95	49	d	1.80E+01	a,m	0.87	d			5.00E+05	1.00E+04	--
M-88	5/3/2006	30.07	54	d	1.80E+01	a,m	0.89	d	5670		5.00E+05	1.00E+04	--
M-88	8/3/2006	30.41	56.3	d	1.80E+01	a,m	0.93	d	5430		5.00E+05	1.00E+04	--
M-88	11/1/2006	30.61	56.1	d	1.80E+01	a,m	0.92	d	6360		5.00E+05	1.00E+04	--
M-88	2/1/2007	30.63	52.4		1.80E+01	a,m	0.93		6280		5.00E+05	1.00E+04	--
M-88	5/3/2007	30.80	47.8	J	1.80E+01	a,m	0.97		6260	J	5.00E+05	1.00E+04	--
M-88	8/2/2007	31.33	55.3		1.80E+01	a,m	0.87		6510		5.00E+05	1.00E+04	--

**Notes:**

1. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.

< = 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

(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](http://ndep.nv.gov/bca/perchlorate02_05.htm)].

(j) Secondary Drinking Water Regulation value.

**Laboratory Qualifiers:**

d = the sample was diluted

u = the analyte was not detected above the sample reporting limit

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

**Validation Qualifiers:**

J = the result is an estimated quantity

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

U = the analyte was analyzed for, but was not detected above the sample reporting limit

UJ = the sample was not detected above the sample reporting limit and the reporting limit is approximate

**LOU 32 Table 7**  
**Soil Characterization Data - Organochlorine Pesticides (OCP)**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	
Boring No.		SA19	SA20	SA20	
Sample ID		SA19-0.5	SA20-0.5	SA20-0.5D	
Sample Depth (ft)		0.5	0.5	0.5	
Sample Date		11/16/2006	11/16/2006	11/16/2006	
Organochlorine Pesticides	PRG <sup>2</sup> mg/kg				Unit
4,4'-DDD	9.95E+00	0.0019 U	0.0019 U	0.021 U	mg/kg
4,4'-DDE	7.02E+00	0.0019 U	0.0019 U	0.021 U	mg/kg
4,4'-DDT	7.02E+00	0.0019 U	0.0019 U	0.021 U	mg/kg
Aldrin	1.00E-01	0.0019 U	0.0019 U	0.021 U	mg/kg
Alpha-BHC	3.59E-01 (bbb)	0.0019 U	0.0019 U	0.021 U	mg/kg
Alpha-chlordane	6.47E+00 (y)	0.0019 U	0.0019 U	0.021 U	mg/kg
Beta-BHC	1.26E+00 (bbb)	0.0019 U	<b>0.029 J</b>	<b>0.032</b>	mg/kg
Delta-BHC	3.59E-01 (z)	0.0019 U	0.0019 U	0.021 U	mg/kg
Dieldrin	1.10E-01	0.0019 U	0.0019 U	0.021 U	mg/kg
Endosulfan I	3.70E+03 (aa)	0.0019 U	0.0019 U	0.021 U	mg/kg
Endosulfan II	3.70E+03 (aa)	0.0019 U	0.0019 U	0.021 U	mg/kg
Endosulfan Sulfate	3.70E+03 (aa)	0.0019 U	0.0019 U	0.021 U	mg/kg
Endrin	1.85E+02	0.0019 U	0.0019 U	0.021 U	mg/kg
Endrin Aldehyde	1.85E+02 (k)	0.0019 U	0.0019 U	0.021 U	mg/kg
Endrin Ketone	1.85E+02 (k)	0.0019 U	0.0019 U	0.021 U	mg/kg
Gamma-BHC (Lindane)	1.74E+00 (bbb)	0.0019 U	0.0019 U	0.021 U	mg/kg
Gamma-Chlordane	6.47E+00 (y)	0.0019 U	0.0019 U	0.021 U	mg/kg
Heptachlor	3.83E-01	0.0019 U	0.0019 U	0.021 U	mg/kg
Heptachlor Epoxide	1.89E-01	0.0019 U	0.0019 U	0.021 U	mg/kg
2. U.S. EPA, Region 9, Preliminary R	3.08E+03	0.0036 U	0.0037 U	0.041 U	mg/kg
Tech-Chlordane	6.47E+00	0.011 U	0.011 U	0.12 U	mg/kg
Toxaphene	1.57E+00	0.055 U	0.056 U	0.62 U	mg/kg

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004).  
(bbb) BHC listed as HCH in the PRG table.  
(y) Value for chlordane (technical) used as surrogate for alpha-chlordane and gamma-chlordane based on 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.

**LOU 32 Table 8**  
**Groundwater Characterization Data - Organochlorine Pesticides (OCP)**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	
Well ID		IAR	M55	M55D	
Sample ID		IAR	M55	M55D	
Sample Date		12/01/2006	12/07/2006	12/07/2006	
Organochlorine Pesticides	MCL <sup>2</sup> ug/L	ug/L	ug/L	ug/L	Unit
4,4'-DDD	2.80E-01 c	0.050 U	0.050 U	0.050 U	ug/L
4,4'-DDE	1.98E-01 c	0.050 U	0.050 U	0.050 U	ug/L
4,4'-DDT	1.98E-01 c	0.050 U	0.050 U	0.050 U	ug/L
Aldrin	4.00E-03 c	0.050 U	0.050 U	0.050 U	ug/L
Alpha-BHC	1.10E-02 c, (bbb)	0.050 U	0.050 U	0.050 U	ug/L
Alpha-chlordane	2.00E+00 (l)	0.050 U	0.050 U	0.050 U	ug/L
Beta-BHC	3.74E-02 c, (bbb)	0.050 U	0.050 U	0.050 U	ug/L
Delta-BHC	1.10E-02 c, (z)	0.050 U	0.050 U	0.050 U	ug/L
Dieldrin	4.20E-03 c, (z)	0.050 U	0.050 U	0.050 U	ug/L
Endosulfan I	2.19E+02 c, (aa)	0.050 U	0.050 U	0.050 U	ug/L
Endosulfan II	2.19E+02 c, (aa)	0.050 U	0.050 U	0.050 U	ug/L
Endosulfan Sulfate	2.19E+02 c, (aa)	0.050 U	0.050 U	0.050 U	ug/L
Endrin	2.00E+00	0.050 U	0.050 U	0.050 U	ug/L
Endrin Aldehyde	1.09E+01 c, (k)	0.050 U	0.050 U	0.050 U	ug/L
Endrin Ketone	1.09E+01 c, (k)	0.050 U	0.050 U	0.050 U	ug/L
Gamma-BHC (Lindane)	2.00E-01	0.050 U	0.050 U	0.050 U	ug/L
Gamma-Chlordane	2.00E+00 (l)	0.050 U	0.050 U	0.050 U	ug/L
Heptachlor	4.00E-01	0.050 U	0.050 U	0.050 U	ug/L
Heptachlor Epoxide	2.00E-01	0.050 U	0.050 U	0.050 U	ug/L
Methoxychlor	4.00E+01	0.10 U	0.10 U	0.10 U	ug/L
2. U.S. EPA, Region 9, Preliminary F	2.00E+00 (l)	0.50 U	0.50 U	0.50 U	ug/L
Toxaphene	3.00E+00	2.0 U	2.0 U	2.0 U	ug/L

**Notes:**

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.
  - (c) Equal to the USEPA Region 9 Preliminary Remediation Goals (PRGs) for tapwater (October, 2004).
  - (bbb) BHC listed as HCH in the PRG table.
  - (l) 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.

**LOU 32 Table 9**  
**Soil Characterization Data - Organophosphorus Pesticides (OPPs)**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	
Boring No.		SA19	SA20	SA20	
Sample ID		SA19-0.5	SA20-0.5	SA20-0.5D	
Sample Depth (ft)		0.5	0.5	0.5	
Sample Date		11/16/2006	11/16/2006	11/16/2006	
OPPs	PRG <sup>2</sup> mg/kg				Unit
Azinphos-methyl	--	0.014 UJ	0.014 U	0.016 UJ	mg/kg
Bolstar	--	0.014 U	0.014 U	0.016 U	mg/kg
Chlorpyrifos	1.85E+03	0.022 U	0.022 U	0.025 U	mg/kg
Coumaphos	--	0.014 UJ	0.014 U	0.016 UJ	mg/kg
Demeton-O	2.46E+01 (cc)	0.043 U	0.043 U	0.048 U	mg/kg
Demeton-S	2.46E+01 (cc)	0.017 U	0.017 U	0.019 U	mg/kg
Diazinon	5.54E+02	0.024 U	0.024 U	0.027 U	mg/kg
Dichlorvos	5.94E+00	0.025 U	0.026 U	0.029 U	mg/kg
Dimethoate	1.23E+02	0.024 UJ	0.024 U	0.027 UJ	mg/kg
Disulfoton	2.46E+01	0.053 U	0.053 U	0.060 U	mg/kg
EPN	6.16E+00	0.014 UJ	0.014 U	0.016 UJ	mg/kg
Ethoprop	--	0.017 U	0.017 U	0.019 U	mg/kg
Ethyl Parathion	1.54E+02 (tt)	0.020 U	0.020 U	0.022 U	mg/kg
Famphur	--	0.014 UJ	0.014 U	0.016 UJ	mg/kg
Fensulfothion	--	0.014 U	0.014 U	0.016 U	mg/kg
Fenthion	1.50E+02 (ff)	0.036 U	0.037 U	0.041 U	mg/kg
Malathion	1.23E+04	0.017 U	0.017 U	0.019 U	mg/kg
Merphos	1.85E+01	0.033 U	0.033 U	0.037 U	mg/kg
Methyl parathion	1.54E+02	0.022 U	0.022 U	0.025 U	mg/kg
2. U.S. EPA, Region 9, Prelimina	--	0.017 U	0.017 U	0.019 U	mg/kg
Naled	1.23E+03	0.036 UJ	0.037 U	0.041 UJ	mg/kg
Phorate	1.23E+02	0.022 U	0.022 U	0.025 U	mg/kg
Ronnel	3.08E+04	0.020 UJ	0.020 U	0.022 UJ	mg/kg
Stirphos	--	0.017 UJ	0.017 U	0.019 UJ	mg/kg
Sulfotep	3.08E+02	0.022 U	0.022 U	0.025 U	mg/kg
Thionazin	--	0.020 U	0.020 U	0.022 U	mg/kg
Tokuthion	--	0.022 U	0.022 U	0.025 U	mg/kg
Trichloronate	--	0.022 U	0.022 U	0.025 U	mg/kg

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004).  
(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.

**LOU 32 Table 10**  
**Groundwater Characterization Data - Organophosphorus Pesticides (OPPs)**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	
Well ID		IAR	M55	M55D	
Sample ID		IAR	M55	M55D	
Sample Date		12/01/2006	12/07/2006	12/07/2006	
OPPs	MCL <sup>2</sup> ug/L				Unit
Azinphos-methyl	--	2.5 UJ	2.5 U	2.5 U	ug/L
Bolstar	--	1.0 U	1.0 U	1.0 U	ug/L
Chlorpyrifos	1.09E+02 c	1.0 U	1.0 U	1.0 U	ug/L
Coumaphos	--	1.0 U	1.0 U	1.0 U	ug/L
Demeton-O	1.46E+00 c,(cc)	1.0 U	1.0 U	1.0 U	ug/L
Demeton-S	1.46E+00 c,(cc)	1.0 U	1.0 U	1.0 U	ug/L
Diazinon	3.28E+01	1.0 U	1.0 U	1.0 U	ug/L
Dichlorvos	2.32E-01	1.0 U	1.0 U	1.0 U	ug/L
Dimethoate	7.30E+00	1.0 U	1.0 U	1.0 U	ug/L
Disulfoton	1.46E+00	0.50 U	0.50 U	0.50 U	ug/L
EPN	3.65E-01	1.2 U	1.2 U	1.2 U	ug/L
Ethoprop	--	0.50 U	0.50 U	0.50 U	ug/L
Ethyl Parathion	9.12E+00 c,(tt)	1.0 U	1.0 U	1.0 U	ug/L
Famphur	--	1.0 U	1.0 U	1.0 U	ug/L
Fensulfothion	--	2.5 U	2.5 U	2.5 U	ug/L
Fenthion	9.10E+00 c,(ff)	2.5 U	2.5 U	2.5 U	ug/L
Malathion	7.30E+02	1.2 U	1.2 U	1.2 U	ug/L
Merphos	1.09E+00	5.0 U	5.0 U	5.0 U	ug/L
Methyl parathion	9.12E+00	4.0 U	4.0 U	4.0 U	ug/L
Mevinphos	--	6.2 U	6.2 U	6.2 U	ug/L
2. U.S. EPA, Region 9, Preliminary	7.30E+01	1.0 UJ	1.0 U	1.0 U	ug/L
Phorate	7.30E+00	1.2 U	1.2 U	1.2 U	ug/L
Ronnel	1.82E+03	10 U	10 U	10 U	ug/L
Stirphos	--	3.5 U	3.5 U	3.5 U	ug/L
Sulfotep	1.82E+01	1.5 U	1.5 U	1.5 U	ug/L
Thionazin	--	1.0 U	1.0 U	1.0 U	ug/L
Tokuthion	--	1.6 U	1.6 U	1.6 U	ug/L
Trichloronate	--	0.50 U	0.50 U	0.50 U	ug/L

**Notes:**

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.
  - (c) Equal to the USEPA Region 9 Preliminary Remediation Goals (PRGs) for tapwater (October, 2004).
  - (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.

**LOU 32 Table 11  
Soil Characterization Data - PCBs**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	
Boring ID		SA19	SA19	SA19	SA19	SA20	SA20	SA20	SA20	SA20	
Sample ID		SA19-0.5	SA19-10	SA19-20	SA19-25	SA20-0.5	SA20-0.5D	SA20-10	SA20-20	SA20-25	
Sample Depth (ft)		0.5	10	20	25	0.5	0.5	10	20	25	
Sample Date		11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	
PCBs	PRG <sup>2</sup> mg/kg										Unit
Aroclor-1016	1.00E+01 (i)	0.036 U	0.036 U	0.036 U	0.038 U	0.037 U	0.041 U	0.039 U	0.035 U	0.039 U	mg/kg
Aroclor-1221	1.00E+01 (i)	0.036 U	0.036 U	0.036 U	0.038 U	0.037 U	0.041 U	0.039 U	0.035 U	0.039 U	mg/kg
Aroclor-1232	1.00E+01 (i)	0.036 U	0.036 U	0.036 U	0.038 U	0.037 U	0.041 U	0.039 U	0.035 U	0.039 U	mg/kg
Aroclor-1242	1.00E+01 (i)	0.036 U	0.036 U	0.036 U	0.038 U	0.037 U	0.041 U	0.039 U	0.035 U	0.039 U	mg/kg
Aroclor-1248	1.00E+01 (i)	0.036 U	0.036 U	0.036 U	0.038 U	0.037 U	0.041 U	0.039 U	0.035 U	0.039 U	mg/kg
Aroclor-1254	1.00E+01 (i)	0.036 U	0.036 U	0.036 U	0.038 U	0.037 U	0.041 U	0.039 U	0.035 U	0.039 U	mg/kg
Aroclor-1260	1.00E+01 (i)	0.036 U	0.036 U	0.036 U	0.038 U	0.037 U	0.041 U	0.039 U	0.035 U	0.039 U	mg/kg

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004).  
(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).



**LOU 32 Table 12  
Groundwater Characterization Data - PCBs**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	
Well ID		IAR	M55	M55D	
Sample ID		IAR	M55	M55D	
Sample Date		12/01/2006	12/07/2006	12/07/2006	
PCBs	MCL <sup>2</sup> ug/L				Unit
Aroclor-1016	5.00E-01 (bb)	0.10 U	0.10 U	0.10 U	ug/L
Aroclor-1221	5.00E-01 (bb)	0.10 U	0.10 U	0.10 U	ug/L
Aroclor-1232	5.00E-01 (bb)	0.10 U	0.10 U	0.10 U	ug/L
Aroclor-1242	5.00E-01 (bb)	0.10 U	0.10 U	0.10 U	ug/L
Aroclor-1248	5.00E-01 (bb)	0.10 U	0.10 U	0.10 U	ug/L
Aroclor-1254	5.00E-01 (bb)	0.10 U	0.10 U	0.10 U	ug/L
Aroclor-1260	5.00E-01 (bb)	0.10 U	0.10 U	0.10 U	ug/L

**Notes:**

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.  
(bb) Value for total PCBs.

**LOU 32 Table 13**  
**Soil Characterization Data - Perchlorate**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

<b>Boring ID</b>	<b>Sample ID</b>	<b>Sample Depth (ft)</b>	<b>Sample Date</b>	<b>Perchlorate ug/kg</b>	<b>PRG<sup>2</sup> mg/kg</b>	<b>Sampling Program</b>
SA19	SA19-0.5	0.5	11/16/2006	<b>217000</b>	1.00E+02	Ph A <sup>1</sup>
	SA19-10	10	11/16/2006	<b>67700</b>	1.00E+02	Ph A
	SA19-20	20	11/16/2006	<b>86100</b>	1.00E+02	Ph A
	SA19-25	25	11/16/2006	<b>47200</b>	1.00E+02	Ph A
SA20	SA20-0.5	0.5	11/16/2006	<b>150</b>	1.00E+02	Ph A
	SA20-0.5D	0.5	11/16/2006	<b>158</b>	1.00E+02	Ph A
	SA20-10	10	11/16/2006	<b>855</b>	1.00E+02	Ph A
	SA20-20	20	11/16/2006	<b>60200</b>	1.00E+02	Ph A
	SA20-25	25	11/16/2006	<b>57600</b>	1.00E+02	Ph A

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004).

**LOU 32 Table 14**  
**Groundwater Characterization Data - Perchlorate**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Well ID Number	Sample ID	Sample Date	Perchlorate	Units	MCL <sup>2</sup> ug/L	Sampling Program
IAR	IAR	12/01/2006	<b>4160000</b>	ug/L	1.80E+01 a,(m)	Ph A <sup>1</sup>
M55	M55	12/07/2006	<b>577000 J+</b>	ug/L	1.80E+01 a,(m)	Ph A
M55D	M55D	12/07/2006	<b>587000 J+</b>	ug/L	1.80E+01 a,(m)	Ph A

**Notes:**

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.
  - (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](http://ndep.nv.gov/bca/perchlorate02_05.htm)].

**LOU 32 Table 15  
Soil Characterization Data - Radionuclides**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

			PRG <sup>2</sup>	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	
				2.60E-02	1.50E-01	2.55E-01	2.02E+01	1.90E+01	3.24E+01	3.98E-01	1.80E+00	
Boring ID Number	Sample ID	Sample Depth (ft)	Date									Sampling Program
SA19	SA19-0.5	0.5	11/16/2006	1.16 J-	2 J-							Ph A
	SA19-10	10	11/16/2006	1.43 J-	1.63 J-							Ph A
	SA19-20	20	11/16/2006	1.76 J-	1.7 J-							Ph A
	SA19-25	25	11/16/2006	1.57 J-	1.38 J-							Ph A
SA20	SA20-0.5	0.5	11/16/2006	1 J-	1.87 J-							Ph A
	SA20-0.5D	0.5	11/16/2006	0.863 J-	1.56 J-							Ph A
	SA20-10	10	11/16/2006	1.31 J-	1.63 J-							Ph A
	SA20-20	20	11/16/2006	1.47 J-	1.76 J-							Ph A
	SA20-25	25	11/16/2006	1.52 J-	1.82 J-							Ph A

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. USEPA, 2004. Radionuclide Toxicity and Preliminary Remediation Goals (PRGs) for Superfund. <http://epa-prgs.ornl.gov/radionuclides/download.shtml>. August 4, 2004. Soil values are the outdoor worker values; water values are the tapwater values. For radionuclides with decay chains, the PRG for the decay chain was used.

**LOU 32 Table 16  
Groundwater Characterization Data - Radionuclides**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

			<b>Ra-226</b>	<b>Ra-228</b>	<b>Th-228</b>	<b>Th-230</b>	<b>Th-232</b>	<b>U-233/234</b>	<b>U-235/236</b>	<b>U-238</b>	
			pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	
		<b>PRG</b> <sup>1,2</sup>	8.16E-04	4.58E-02	1.59E-01	5.23E-01	4.71E-01	6.74E-01	6.63E-01	5.47E-01	
<b>Well ID Number</b>	<b>Sample ID</b>	<b>Date</b>									<b>Sampling Program</b>
IAR	IAR-Z	05/08/2007	<b>1.67 J</b>	<b>1.30 B</b>							Ph A <sup>3</sup>
M55	M55-Z*	05/08/2007									Ph A

**Notes:**

1. Equal to the USEPA Region 9 Preliminary Remediation Goals (PRGs) for tapwater (October, 2004).
2. USEPA, 2004. Radionuclide Toxicity and Preliminary Remediation Goals (PRGs) for Superfund. <http://epa-prgs.ornl.gov/radionuclides/download.shtml>. August 4, 2004. Soil values are the outdoor worker values; water values are the tapwater values. For radionuclides with decay chains, the PRG for the decay chain was used.
3. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.

**LOU 32 Table 17**  
**Soil Characterization Data - SVOCs**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program			Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A
Boring No.			SA19	SA19	SA19	SA19	SA20	SA20	SA20	SA20	SA20
Sample ID			SA19-0.5	SA19-10	SA19-20	SA19-25	SA20-0.5	SA20-0.5D	SA20-10	SA20-20	SA20-25
Sample Depth (ft)			0.5	10	20	25	0.5	0.5	10	20	25
Sample Date			11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/15/2006	11/15/2006	11/15/2006	11/15/2006	11/15/2006
SVOC		PRG <sup>2</sup> mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,4-Dioxane	non-SIM	1.57E+02	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
2-Methylnaphthalene	non-SIM	1.88E+02 (jj)	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
2-Methylnaphthalene	SIM	1.88E+02 (jj)									
Acenaphthene	non-SIM	2.92E+04	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Acenaphthene	SIM	2.92E+04									
Acenaphthylene	non-SIM	2.92E+04 (pp)	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Acenaphthylene	SIM	2.92E+04 (pp)									
Anthracene	non-SIM	2.40E+05 (oo)	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Anthracene	SIM	2.40E+05 (oo)									
Benz(a)anthracene	non-SIM	2.11E+00	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Benz(a)anthracene	SIM	2.11E+00									
Benzo(a)pyrene	non-SIM	2.11E-01	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Benzo(a)pyrene	SIM	2.11E-01									
Benzo(b)fluoranthene	non-SIM	2.11E+00	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Benzo(b)fluoranthene	SIM	2.11E+00									
Benzo(g,h,i)perylene	non-SIM	2.91E+04 (w)	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Benzo(g,h,i)perylene	SIM	2.91E+04 (w)									
Benzo(k)fluoranthene	non-SIM	2.11E+01	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Benzo(k)fluoranthene	SIM	2.11E+01									
2. U.S. EPA, Region 9, Prelim	non-SIM	1.23E+02	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Butyl benzyl phthalate	non-SIM	1.23E+05 (oo)	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Chrysene	non-SIM	2.11E+02	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Chrysene	SIM	2.11E+02									
Dibenz(a,h)anthracene	non-SIM	2.11E-01	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Dibenz(a,h)anthracene	SIM	2.11E-01									
Diethyl phthalate	non-SIM	4.92E+05 (oo)	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Dimethyl phthalate	non-SIM	6.16E+06 (oo)	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Di-N-Butyl phthalate	non-SIM	6.16E+04	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Di-N-Octyl phthalate	non-SIM	2.46E+04	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U

**LOU 32 Table 17 (continued)  
Soil Characterization Data - SVOCs**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program			Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A
Boring No.			SA19	SA19	SA19	SA19	SA20	SA20	SA20	SA20	SA20
Sample ID			SA19-0.5	SA19-10	SA19-20	SA19-25	SA20-0.5	SA20-0.5D	SA20-10	SA20-20	SA20-25
Sample Depth (ft)			0.5	10	20	25	0.5	0.5	10	20	25
Sample Date			11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/15/2006	11/15/2006	11/15/2006	11/15/2006	11/15/2006
SVOC		PRG <sup>2</sup> mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Fluoranthene	non-SIM	2.20E+04	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Fluoranthene	SIM	2.20E+04									
Fluorene	non-SIM	2.63E+04	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Fluorene	SIM	2.63E+04									
Hexachlorobenzene	non-SIM	1.08E+00	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Hexachlorobenzene	SIM	1.08E+00									
Indeno(1,2,3-cd)pyrene	non-SIM	2.11E+00	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Indeno(1,2,3-cd)pyrene	SIM	2.11E+00									
Naphthalene	non-SIM	1.88E+02	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Naphthalene	non-SIM	1.88E+02	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Naphthalene	SIM	1.88E+02									
Nitrobenzene	non-SIM	1.03E+02	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Octachlorostyrene	non-SIM	--	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Phenanthrene	non-SIM	2.40E+05 (n)	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Phenanthrene	SIM	2.40E+05 (n)									
Pyrene	non-SIM	2.91E+04	360 U	360 U	360 U	380 U	370 U	410 U	390 U	350 U	390 U
Pyrene	SIM	2.91E+04									
Pyridine	non-SIM	6.16E+02	1800 U	1700 U	1800 U	1900 U	1800 U	2000 U	1900 U	1700 U	1900 U

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
  2. U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004).
- (j) Value for naphthalene used as surrogate for 2-methylnaphthalene based on structural similarities.  
 (pp) Value for acenaphthene used as surrogate for acenaphthylene based on structural similarities.  
 (oo) PRG is based on maximum (1E+05 mg/kg). Therefore, the risk-based value provided in the electronic backup to the PRG table was used.  
 (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.

**LOU 32 Table 18  
Groundwater Characterization Data - SVOCs**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program			Ph A <sup>1</sup>	Ph A	Ph A
Well No.			IAR	M55	M55D
Sample ID			IAR	M55	M55D
Sample Date			12/01/2006	12/07/2006	12/07/2006
SVOCs		MCL <sup>2</sup> ug/L	ug/L	ug/L	ug/L
1,4-Dioxane	non-SIM	6.11E+00 c	10 U	10 U	10 U
2-Methylnaphthalene	non-SIM	6.20E+00 c,(jj)	10 U	10 U	10 U
2-Methylnaphthalene	SIM	6.20E+00 c,(jj)		0.20 U	0.20 U
Acenaphthene	non-SIM	3.65E+02 c	10 U	10 U	10 U
Acenaphthene	SIM	3.65E+02 c		0.20 U	0.20 U
Acenaphthylene	non-SIM	3.65E+02 c,(pp)	10 UJ	10 U	10 U
Acenaphthylene	SIM	3.65E+02 c,(pp)		0.20 U	0.20 U
Anthracene	non-SIM	1.83E+03 c	10 U	10 U	10 U
Anthracene	SIM	1.83E+03 c		0.20 U	0.20 U
Benz(a)anthracene	non-SIM	9.21E-02 c	10 U	10 U	10 U
Benz(a)anthracene	SIM	9.21E-02 c		0.20 U	0.20 U
Benzo(a)pyrene	non-SIM	2.00E-01	10 U	10 U	10 U
Benzo(a)pyrene	SIM	2.00E-01		0.20 U	0.20 U
Benzo(b)fluoranthene	non-SIM	9.21E-02 c	10 U	10 U	10 U
Benzo(b)fluoranthene	SIM	9.21E-02 c		0.20 U	0.20 U
Benzo(g,h,i)perylene	non-SIM	1.83E+02 c,(w)	10 U	10 U	10 U
Benzo(g,h,i)perylene	SIM	1.83E+02 c,(w)		0.20 U	0.20 U
Benzo(k)fluoranthene	non-SIM	9.21E-01 c	10 U	10 U	10 U
Benzo(k)fluoranthene	SIM	9.21E-01 c		0.20 U	0.20 U
bis(2-Ethylhexyl)phthalate	non-SIM	6.00E+00	10 U	10 U	10 U
2. U.S. EPA, Region 9, Prelim	non-SIM	7.30E+03 c	10 U	10 U	10 U
Chrysene	non-SIM	9.21E+00 c	10 U	10 U	10 U
Chrysene	SIM	9.21E+00 c		0.20 U	0.20 U
Dibenz(a,h)anthracene	non-SIM	9.21E-03 c	10 U	10 U	10 U
Dibenz(a,h)anthracene	SIM	9.21E-03 c		0.20 U	0.20 U
Diethyl phthalate	non-SIM	2.92E+04 c	10 U	10 U	10 U
Dimethyl phthalate	non-SIM	3.65E+05 c	10 U	10 U	10 U
Di-N-Butyl phthalate	non-SIM	3.65E+03 c	10 U	10 U	10 U
Di-N-Octyl phthalate	non-SIM	1.46E+03 c	10 U	10 U	10 U
Fluoranthene	non-SIM	1.46E+03 c	10 U	10 U	10 U
Fluoranthene	SIM	1.46E+03 c		0.23 U	0.26 U
Fluorene	non-SIM	2.43E+02 c	10 U	10 U	10 U
Fluorene	SIM	2.43E+02 c		0.20 U	0.20 U
Hexachlorobenzene	non-SIM	1.00E+00	10 U	10 U	10 U
Hexachlorobenzene	SIM	1.00E+00		0.20 U	0.20 U
Indeno(1,2,3-cd)pyrene	non-SIM	9.21E-02 c	10 U	10 UJ	10 UJ
Indeno(1,2,3-cd)pyrene	SIM	9.21E-02 c		0.20 U	0.20 U
Naphthalene	non-SIM	6.20E+00 c	5.0 U	5.0 U	5.0 U
Naphthalene	non-SIM	6.20E+00 c	10 U	10 UJ	10 UJ
Naphthalene	SIM	6.20E+00 c		0.20 U	0.20 U
Nitrobenzene	non-SIM	3.40E+00 c	10 U	10 U	10 U
Octachlorostyrene	non-SIM	-- c	10 U	10 U	10 U
Phenanthrene	non-SIM	1.80E+03 (n)	10 U	10 U	10 U
Phenanthrene	SIM	1.80E+03 (n)		0.20 U	0.20 U
Pyrene	non-SIM	1.83E+02 c	10 U	10 U	10 U
Pyrene	SIM	1.83E+02 c		0.20 U	0.20 U
Pyridine	non-SIM	3.65E+01 c	20 U	20 U	20 U

**Notes:**

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.
  - (c) Equal to the USEPA Region 9 Preliminary Remediation Goals (PRGs) for tapwater (October, 2004).
  - (jj) Value for naphthalene used as surrogate for 2-methylnaphthalene based on structural similarities.
  - (pp) Value for acenaphthene used as surrogate for acenaphthylene 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.



LOU 32 Table 19  
Soil Characterization Data - VOCs

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program	Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A
Boring No.	SA19	SA19	SA19	SA19	SA20	SA20	SA20	SA20	SA20	SA20
Sample ID	SA19-0.5	SA19-10	SA19-20	SA19-25	SA20-0.5	SA20-0.5D	SA20-10	SA20-20	SA20-25	SA20-25
Sample Depth (ft)	0.5	10	20	25	0.5	0.5	10	20	25	25
Sample Date	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006
VOCs	PRG <sup>2</sup> mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Naphthalene	1.88E+02	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,1,1,2-Tetrachloroethane	7.28E+00	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,1,1-Trichloroethane	6.90E+03 (mm)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,1,2,2-Tetrachloroethane	9.29E-01	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,1,2-Trichloroethane	1.61E+00	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,1-Dichloroethane	1.74E+03	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,1-Dichloroethene	4.13E+02	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,1-Dichloropropene	1.76E+00 (gg)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,2,3-Trichlorobenzene	2.16E+02 (hh)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,2,3-Trichloropropane	7.60E-02 (yy)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,2,4-Trichlorobenzene	2.16E+02	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,2,4-Trimethylbenzene	1.70E+02	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,2-Dibromo-3-chloropropane	2.02E+00	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,2-Dichlorobenzene	4.00E+03 (mm)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,2-Dichloroethane	6.03E-01	5.5 U	5.5 U	5.5 U	<b>3.2 J</b>	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,2-Dichloropropane	7.42E-01	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,3,5-Trimethylbenzene	6.97E+01	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	<b>0.30 J</b>	5.9 U
1,3-Dichlorobenzene	2.10E+03 (mm)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
1,3-Dichloropropane	3.61E+02	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
2. U.S. EPA, Region 9, Preliminary Re	7.87E+00	<b>17</b>	<b>15</b>	<b>15</b>	5.8 U	<b>12</b>	<b>9.1</b>	<b>14</b>	<b>11</b>	<b>9.0</b>
2,2-Dichloropropane	7.42E-01 (ii)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
2-Butanone	1.13E+05	11 U	11 U	11 U	12 U	11 U	12 U	12 U	11 U	12 U
2-Chlorotoluene	5.60E+02	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
2-Hexanone	4.70E+04 (nn)	11 UJ	11 UJ	11 UJ	12 UJ	11 UJ	12 UJ	12 UJ	11 UJ	12 UJ
2-Methoxy-2-methyl-butane	--	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
4-Chlorotoluene	5.60E+02 (ww)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
4-Isopropyltoluene	--	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
4-Methyl-2-pentanone	4.70E+04	11 U	11 U	11 U	12 U	11 U	12 U	12 U	11 U	12 U
Acetone	5.43E+04	11 U	11 U	22 U	24 UJ	11 U	12 U	12 U	29 U	12 U
Benzene	1.41E+00	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	<b>0.37 J</b>	5.9 U
Bromobenzene	9.22E+01	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Bromochloromethane	1.83E+00 (qq)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Bromodichloromethane	1.83E+00	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Bromoforn	2.18E+02	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Bromomethane	1.31E+01	11 UJ	11 UJ	11 UJ	12 UJ	11 U	12 U	12 U	11 U	12 UJ
Carbon tetrachloride	5.49E-01	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Chlorobenzene	5.30E+02	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Chloroethane	6.49E+00	5.5 UJ	5.5 UJ	5.5 UJ	5.8 UJ	5.6 UJ	6.2 UJ	5.9 UJ	5.3 UJ	5.9 UJ
Chloroform	4.70E-01	5.5 U	5.5 U	5.5 U	5.8 U	<b>0.52 J</b>	6.2 U	<b>0.50 J</b>	<b>0.90 J</b>	<b>0.67 J</b>
Chloromethane	1.56E+02	5.5 UJ	5.5 UJ	5.5 UJ	5.8 UJ	5.6 UJ	6.2 UJ	5.9 UJ	5.3 UJ	5.9 UJ
cis-1,2-Dichloroethene	1.46E+02	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
cis-1,3-Dichloropropene	1.76E+00 (gg)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U

**LOU 32 Table 19 (continued)  
Soil Characterization Data - VOCs**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program	Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A
	SA19	SA19	SA19	SA19	SA20	SA20	SA20	SA20	SA20	SA20
Sample ID	SA19-0.5	SA19-10	SA19-20	SA19-25	SA20-0.5	SA20-0.5D	SA20-10	SA20-20	SA20-20	SA20-25
Sample Depth (ft)	0.5	10	20	25	0.5	0.5	10	20	20	25
Sample Date	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006	11/16/2006
VOCs	PRG <sup>2</sup> mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dibromochloromethane	2.55E+00	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Dibromomethane	2.34E+02 (xx)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Dichlorodifluoromethane	3.08E+02	5.5 UJ	5.5 UJ	5.5 UJ	5.8 UJ	5.6 UJ	6.2 UJ	5.9 UJ	5.3 UJ	5.9 UJ
Ethyl t-butyl ether	3.64E+01 (kk)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Ethylbenzene	7.40E+03 (mm)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Ethylene dibromide	7.30E-02	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Hexachlorobutadiene	2.21E+01	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
isopropyl ether	--	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Isopropylbenzene	2.00E+03 (zz)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Methyl tert butyl ether	3.64E+01	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Methylene chloride	2.05E+01	5.5 U	5.5 U	<b>10</b>	<b>4.4 J</b>	5.6 U	6.2 U	5.9 U	5.3 U	<b>3.8 J</b>
N-Butylbenzene	2.19E+03 (mm)	5.5 UJ	5.5 UJ	5.5 UJ	5.8 UJ	5.6 U	6.2 U	5.9 U	5.3 U	5.9 UJ
N-Propylbenzene	2.19E+03 (mm)	5.5 UJ	5.5 UJ	5.5 UJ	5.8 UJ	5.6 UJ	6.2 UJ	5.9 UJ	5.3 UJ	5.9 UJ
sec-Butylbenzene	1.63E+03 (mm)	5.5 UJ	5.5 UJ	5.5 UJ	5.8 UJ	5.6 UJ	6.2 UJ	5.9 UJ	5.3 UJ	5.9 UJ
Styrene	1.80E+04 (mm)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
t-Butyl alcohol	--	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	12 UJ	12 UJ	11 UJ	12 UJ
tert-Butylbenzene	1.97E+03 (mm)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Tetrachloroethene	1.31E+00	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Toluene	2.20E+03 (mm)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	<b>0.48 J</b>	5.3 U	5.9 U
trans-1,2-Dichloroethylene	--	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
trans-1,3-Dichloropropene	1.76E+00 (gg)	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Trichloroethene	1.15E-01	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Trichlorofluoromethane	1.28E+03 (mm)	5.5 UJ	5.5 UJ	5.5 UJ	5.8 UJ	5.6 UJ	6.2 UJ	5.9 UJ	5.3 UJ	5.9 UJ
Vinylchloride	7.46E-01	5.5 U	5.5 U	5.5 U	5.8 U	5.6 U	6.2 U	5.9 U	5.3 U	5.9 U
Xylene (Total)	9.00E+02 (mm)	11 U	11 U	11 U	12 U	11 U	12 U	12 U	11 U	12 U

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
  2. U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004).
- (mm) PRG is based on the soil saturation limit. Therefore, the risk-based value provided in the electronic backup to the PRG table was used.
- (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.
- (yy) PRG table (c) lists both cancer and non-cancer endpoint-based values. The cancer endpoint-based values were selected, as the cancer endpoint-based values are lower than the noncancer endpoint-based values.
- (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.
- (zz) Isopropyl benzene is listed as cumene (isopropylbenzene) in the PRG table.

**LOU 32 Table 20  
Groundwater Characteristic Data - VOCs**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A
Well ID		IAR	M55	M55D
Sample ID		IAR	M55	M55D
Sample Date		12/01/2006	12/07/2006	12/07/2006
VOCs	MCL <sup>2</sup> ug/L	ug/L	ug/L	ug/L
Naphthalene	6.20E+00 c	5.0 U	5.0 U	5.0 U
1,1,1,2-Tetrachloroethane	4.32E-01 c	5.0 U	5.0 U	5.0 U
1,1,1-Trichloroethane	2.00E+02	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	5.00E+00	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	5.00E+00	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	8.11E+02 c	5.0 U	5.0 U	5.0 U
1,1-Dichloroethene	7.00E+00	5.0 U	5.0 U	5.0 U
1,1-Dichloropropene	3.95E-01 c,gg	5.0 U	5.0 U	5.0 U
1,2,3-Trichlorobenzene	7.16E+00 c,hh	5.0 U	5.0 U	5.0 U
1,2,3-Trichloropropane	5.60E-03 c,yy	5.0 U	5.0 U	5.0 U
1,2,4-Trichlorobenzene	7.00E+01	5.0 U	5.0 U	5.0 U
1,2,4-Trimethylbenzene	1.23E+01	5.0 U	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane	2.00E-01	5.0 U	5.0 UJ	5.0 U
1,2-Dichlorobenzene	6.00E+02	<b>0.49 J</b>	<b>0.61 J+</b>	<b>0.55 J</b>
1,2-Dichloroethane	5.00E+00	5.0 U	5.0 UJ	5.0 U
1,2-Dichloropropane	5.00E+00	5.0 U	5.0 U	5.0 U
1,3,5-Trimethylbenzene	1.23E+01 c	5.0 U	5.0 U	5.0 U
1,3-Dichlorobenzene	1.83E+02 c	5.0 U	5.0 U	5.0 U
1,3-Dichloropropane	1.22E+02 c	5.0 U	5.0 U	5.0 U
1,4-Dichlorobenzene	7.50E+01	5.0 U	<b>0.68 J+</b>	<b>0.71 J</b>
2. U.S. EPA, Region 9, Preliminary	1.65E-01 c,ii	5.0 U	5.0 U	5.0 U
2-Butanone	6.97E+03 c	10 U	10 U	10 U
2-Chlorotoluene	1.22E+02 c	5.0 U	5.0 U	5.0 U
2-Hexanone	2.00E+03 c,nn	10 UJ	10 U	10 UJ
2-Methoxy-2-methyl-butane	--	5.0 U	5.0 U	5.0 UJ
4-Chlorotoluene	1.22E+02 c,ww	5.0 U	5.0 U	5.0 U
4-Isopropyltoluene	--	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone	1.99E+03 c	10 U	10 UJ	10 UJ
Acetone	5.48E+03 c	10 U	10 UJ	10 U
Benzene	5.00E+00	5.0 U	5.0 U	5.0 U
Bromobenzene	2.03E+01 c	5.0 U	5.0 U	<b>0.38 J</b>
Bromochloromethane	1.81E-01 c,qq	5.0 U	5.0 U	5.0 U
Bromodichloromethane	8.00E+01 r	5.0 U	5.0 U	<b>0.43 J</b>
Bromoform	8.00E+01 r	5.0 U	<b>4.4 J+</b>	<b>12 J</b>
Bromomethane	8.66E+00 c	<b>0.92 J</b>	10 UJ	10 U
Carbon tetrachloride	5.00E+00	5.0 U	5.0 U	5.0 U
Chlorobenzene	1.00E+02 c,o	5.0 U	5.0 U	5.0 U
Chloroethane	4.64E+00	5.0 UJ	5.0 U	5.0 U

**LOU 32 Table 20 (continued)**  
**Groundwater Characteristic Data - VOCs**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A
Well ID		IAR	M55	M55D
Sample ID		IAR	M55	M55D
Sample Date		12/01/2006	12/07/2006	12/07/2006
VOCs	MCL <sup>2</sup> ug/L	ug/L	ug/L	ug/L
Chloroform	8.00E+01 r	<b>21</b>	<b>690</b>	<b>660 J+</b>
Chloromethane	1.58E+02 c	<b>2.7 J</b>	5.0 U	5.0 U
cis-1,2-Dichloroethene	7.00E+01	5.0 U	5.0 U	5.0 U
cis-1,3-Dichloropropene	3.95E-01 c,gg	5.0 U	5.0 U	5.0 U
Dibromochloromethane	8.00E+01 r	5.0 U	5.0 U	<b>0.50 J</b>
Dibromomethane	6.08E+01 c,xx	5.0 U	5.0 U	5.0 U
Dichlorodifluoromethane	3.95E+02 c	5.0 UJ	5.0 U	5.0 UJ
Ethyl t-butyl ether	1.10E+01 c,kk	5.0 U	5.0 U	5.0 UJ
Ethylbenzene	7.00E+02	5.0 U	5.0 U	5.0 U
Ethylene dibromide	--	5.0 U	5.0 U	5.0 U
Hexachlorobutadiene	8.62E-01 c	5.0 U	5.0 U	5.0 U
isopropyl ether	--	5.0 U	5.0 U	5.0 UJ
Isopropylbenzene	6.58E+02 c,zz	5.0 U	5.0 U	5.0 U
Methyl tert butyl ether	2.00E+01 a,uu	5.0 U	5.0 U	5.0 U
Methylene chloride	5.00E+00	5.0 U	5.0 U	5.0 UJ
N-Butylbenzene	2.43E+02 c	5.0 U	5.0 U	5.0 U
N-Propylbenzene	2.43E+02 c	5.0 U	5.0 U	5.0 U
sec-Butylbenzene	2.43E+02 c	5.0 U	5.0 U	5.0 U
Styrene	1.00E+02	R	5.0 U	5.0 U
t-Butyl alcohol	--	10 UJ	10 UJ	10 UJ
tert-Butylbenzene	2.43E+02 c	5.0 U	5.0 U	5.0 U
Tetrachloroethene	5.00E+00	5.0 U	5.0 U	5.0 U
Toluene	1.00E+03	5.0 U	5.0 U	5.0 U
trans-1,2-Dichloroethylene	1.00E+02	5.0 U	5.0 U	5.0 U
trans-1,3-Dichloropropene	--	5.0 U	5.0 U	5.0 U
Trichloroethene	5.00E+00	5.0 U	<b>12 J+</b>	<b>9.9</b>
Trichlorofluoromethane	--	5.0 UJ	5.0 U	5.0 U
Vinylchloride	2.00E+00	5.0 UJ	5.0 U	5.0 U
Xylene (Total)	1.00E+04	10 U	10 U	10 UJ

**Notes:**

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.

**LOU 32 Table 21**  
**Soil Characterization Data - Long Asbestos Fibers in Respirable Soil Fraction**

Groundwater Remediation Unit  
Tronox LLC Facility - Henderson, Nevada

			Long Amphibole Protocol Structures	Long Amphibole Protocol Structures (structures/samples)	Long Chrysotile Protocol Structures	Long Chrysotile Protocol Structures (structures/samples)	Sampling Program
<b>No.</b>	<b>Sample ID</b>	<b>Sample Date</b>	s/gPM10		s/gPM10		
SA19	SA19	12/07/2006	<b>10100000</b>	<b>3</b>	<b>10100000</b>	<b>3</b>	Ph A <sup>1</sup>
SA20	SA20	12/07/2006	2942000 U	0	2942000 U	0	Ph A

**Notes:**

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

## Notes for Phase A Data Tables

Groundwater Remediation Unit  
Tronox LLC, Henderson, Nevada

Blank	Not analyzed.
<b>Bold</b>	Bold values are constituents detected above the laboratory sample quantitation limit.
Gray	Grayed out values are non-detected values with the laboratory sample quantitation limits shown.
B	The result may be a false positive totally attributable to blank contamination.
D	Dissolved Metals.
DO	Dissolved Oxygen.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J-	The result is an estimated quantity and the result may be biased low.
J+	The result is an estimated quantity and the result may be biased high.
J+	The result is an estimated quantity and the result may be biased high.
JB	The result may be biased high partially attributable to blank contamination.
JK	The result is an estimated maximum possible concentration.
R	The result was rejected and unusable due to serious data deficiencies. The presence or absence of the analyte cannot be verified.
S	Soluble metals
T	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.
nm	Not measured.
NTUs	Nephelometric Turbidity Units.
ORP	Oxidation-reduction potential.
pCi/g	PicoCuries per gram.
2. U.S. EPA	PicoCuries per liter.
s/gPM10	Revised protocol structures per gram PM10 fraction dust.
TEF	Toxic Equivalency Factor.
TEQ	Toxic Equivalent Concentration
ug/kg	Micrograms per kilogram.
ug/L	Micrograms per liter.
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 filtered.
Z	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).
(b)	Calculated assuming 1/2 detection limit as proxy for non-detected congeners and 2006 TEFs.
--	PRG not established