Summary of Available Data for LOU 22 and LOU 23 (Pond WC-West and WC-East) Associated Piping in Area II

Tronox Facility – Henderson, Nevada

Name of Facility:

LOU 22 (Pond WC-West) and LOU 23 (Pond WC-East) Associated Piping in Area II

Goal of Closure:

- Continuation of current use – regulatory closure not presently requested.

Site Investigation Area:

Associated Piping in Area II

- Size: Approximately 3,000 linear feet in total. Approximately 860 linear feet of piping is contained within Area II.
- Location: Piping extends south from the southeastern corner of LOU 23 (Pond WC-East) in the vicinity of 9th Avenue [Ref. 5]. In Area II, associated piping extends south near the eastern boundary of LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process and Ponds) and continues to follow the north and west sides of the Eastern Diversion Ditches of LOU 5 (Beta Ditch).
- Current Status/Features: The piping in Area ll associated with LOUs 22 and 23 is currently active and continues to move process waste to Ponds WC-West and WC-East.

Ponds WC-West and WC-East (in Area I)

- Pond WC-West Size [Ref. 3]:
  - Approximately 440 feet by 280 feet.
  - Surface area of 123,200 sq. ft. (2.8-acres).
  - Capacity of 12,515,200 gallons.
- Pond WC-West Location: Approximately 40 feet east of GW-11 Pond in Area I.
- Pond WC-East Size [Ref. 3]:
  - Approximately 450 feet by 285 feet.
  - Surface area of 128,250 sq. ft. (2.9-acres).
  - Capacity of 19,658,500 gallons.
- Pond WC-East Location: Approximately 500 feet east of GW-11 Pond in Area I.
- Current Status/Features: Ponds WC-West, WC-East, and the associated piping in Area I are currently active.

Description:

Associated Piping in Area ll

- Waste water enters Pond WC-West and Pond WC-East on the southeastern corner via aboveground pipelines from Areas II and III [Ref. 5].
- Historically, both ponds received composite liquid waste streams from Units 3, 5, and 6 and the steam plant via aboveground piping through Area II [Ref. 3].

Summary of Available Data for LOU 22 and LOU 23 (Pond WC-West and WC-East) Associated Piping in Area II

Tronox Facility – Henderson, Nevada

Ponds WC-West and WC-East (in Area I)

- Constructed in late 1988, both surface impoundments began operating in March 1989, and are currently in use [Ref. 3].
- Currently (as of January 2008), both ponds regularly receive composite liquid waste streams from Unit 6, the distillation plant, the steam plant, and the boron/boron trichloride production area (currently north of Unit 4) [Ref. 5].
- On occasion, process waste water from LOU 20 (Pond C-1) and the boron processes was pumped directly to Pond WC-West [Ref. 4].

Process Waste Streams Associated with LOUs 22 and 23	Known or Potential Constituents Associated with LOUs 22 and 23
Concentrated brine from the vapor recompression units that included [Ref. 3]: - Process water softeners - Steam generation blow down - Cooling tower blow down from Units 3 and 5 - Manganese dioxide product wash solution from Unit 6 - Manganese dioxide cathode wash solution - Process seal water/filter flush	• Metals (magnesium, manganese from cathode scale, manganese dioxide, and boron) • Hexavalent chromium • Perchlorate • Chlorate • Wet chemistry analytes • Sodium hexametaphosphate
Process Waste Streams Associated with the Boron/Boron Trichloride Plant North of Unit 4 (Current Location) and Unit 5 (Former Location)	**Known or Potential Constituents Associated with the Boron/Boron Trichloride Plant North of Unit 4 (Current Location) and Unit 5 (Former Location)**
Neutralized solution from boron and boron trichloride process [Ref. 4].	• Metals (boron) • Wet chemistry analytes

Overlapping or Adjacent LOUs: The following LOUs overlap or are adjacent to LOU 22 and LOU 23:

Overlapping LOUs

- LOU 60 (Acid Drain System) – Overlaps LOUs 22 and 23 associated piping in Area II.
- LOU 5 (Beta Ditch) – LOU 5 runs perpendicular beneath the associated piping for LOUs 22 and 23 in Area II.

Summary of Available Data for LOU 22 and LOU 23 (Pond WC-West and WC-East) Associated Piping in Area II

Tronox Facility – Henderson, Nevada

Adjacent LOUs

- LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process and Ponds) – Located west (downgradient) of LOUs 22 and 23 associated piping.
- LOU 13 (Pond S-1) – Located east (upgradient) of LOUs 22 and 23 associated piping.

Known or potential chemical classes for the LOUs previously mentioned are not likely to affect the SRCs consistent with those listed for LOUs 22 and 23; therefore, no additional chemical classes have been added to the analytical plan for LOUs 22 and 23. For detailed information on the LOUs listed above, please refer to the specific LOU data package.

LOUs Potentially Affecting Soils in LOUs 22 and 23:

- LOU 60 (Former Acid Drain System): Underground pipelines associated with LOU 60 ran across the route of the LOUs 22 and 23 associated piping. The pipelines associated with LOUs 22 and 23 may have been affected by possible leaks (none reported) associated with LOU 60.
- LOU 5 (Beta Ditch): The Piping associated with LOUs 22 and 23 runs mainly parallel with the Eastern Diversion Ditches. Possible overtopping (none reported) of the ditch could have affected LOUs 22 and 23 associated piping.

Known or potential chemical classes associated with LOU 60 and LOU 5 are not consistent with those listed for LOUs 22 and 23; however, no leaks or overtopping incidences were was reported for either LOU. Therefore, no additional chemical classes have been added to the analytical plan for LOUs 22 and 23 associated piping.

For further information, please refer to the LOU data packages.

Known or Potential Chemical Classes:

- Metals
- Hexavalent chromium
- Perchlorate
- Chlorate
- Wet chemistry analytes

Summary of Available Data for LOU 22 and LOU 23 (Pond WC-West and WC-East) Associated Piping in Area II

Tronox Facility – Henderson, Nevada

Known or Potential Release Mechanisms:

- No known releases documented for these LOUs.
- Potential infiltration to subsurface soil and groundwater could have occurred from potential leaks in the pipelines; however, no leaks were identified in the documents reviewed.

Results of Historical Sampling:

- No historical soil boring locations were identified in the documents reviewed for the pipelines in Area II. The nearest soil boring (BDB-05) is located approximately 125 feet east of LOUs 22 and 23 associated piping and is not considered to be representative.
- Upgradient and downgradient monitoring wells (M-2A, M-17A, M-19, M-34, and M-39) are tested for total chromium, perchlorate, and total dissolved solids as part of a periodic or routine groundwater monitoring program [Ref. 2].
- Analytical results are summarized in LOUs 22 and 23 Table 1 through 6 (see attached) [Ref.2].

Summary of Phase A SAI:

No soil or groundwater samples were specifically collected in the Phase A Source Area Investigation for LOUs 22 and 23 associated piping in Area II.

<u>Soil</u>

- The closest Phase A Investigation boring SA17 is located approximately 315 feet northeast (downgradient) of LOUs 22 and 23 associated piping in Area II [Ref. 1]. This boring is not considered to be representative of soil conditions for the length of the pipelines in Area II.

<u>Groundwater</u>

- The closest Phase A Investigation well (M-34) is located approximately 90 feet to the east (cross-gradient) of LOUs 22 and 23 associated piping [Ref. 1]. This monitoring well is not considered to be representative for the pipelines in Area II.

The Phase B analytical plan for samples collected from LOUs 22 and 23 associated piping in Area II will be based upon known or potential chemical classes.

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

- No

Is Phase B Investigation Recommended?

- Yes; soil samples were not collected to evaluate LOUs 22 and 23 associated piping in Area II.

Summary of Available Data for LOU 22 and LOU 23 (Pond WC-West and WC-East) Associated Piping in Area II

Tronox Facility – Henderson, Nevada

Proposed Phase B Soil Investigation/Rationale:

The Phase B investigation of LOUs 22 and 23 associated piping consists of collecting soil samples from two (2) boring locations along the pipeline in Area II leading from LOU 61 (Old Sodium Chlorate Plant Decommissioning and Unit 5 Basement) to LOUs 22 and 23 associated piping.

- Two (2) soil borings will be drilled along LOUs 22 and 23 associated pipelines.

- Soil sample locations consist of both judgmental and randomly-placed locations.
- Judgmental sample locations:
  - Designed to evaluate soil for known or potential chemical classes associated with LOUs 22 and 23 associated piping.
  - One (1) of the two sample locations is a judgmental location and includes soil boring SA155.
- Random sample grid locations:
  - Designed to assess whether unknown constituents associated with LOUs 22 and 23 associated piping in Area II are present.
  - One (1) of the two sample locations is randomly-placed location RSAN7.
  - Both borings along with the analytical program to evaluate soil samples from LOUs 22 and 23 associated piping are listed on **Table A – Soil Sampling and Analytical Plan for LOU 22 and LOU 23.**

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

Summary of Available Data for LOU 22 and LOU 23 (Pond WC-West and WC-East) Associated Piping in Area II

Tronox Facility – Henderson, Nevada

Proposed Phase B Groundwater Investigation/Rationale:

- The Phase B groundwater investigation of LOU 22 and LOU 23 associated piping in Area II consists of collecting groundwater samples from five (5) locations to evaluate local groundwater conditions and as part of the site-wide evaluation of constituent trends in groundwater.
  - Two (2) monitoring wells (M-2A and M-17A) located west (upgradient) of LOUs 22 and 23 associated piping will be sampled.
  - Three (3) monitoring wells (M-19, M-34, and M-39) located east (downgradient) of LOUs 22 and 23 associated piping will be sampled.
  - All five wells along with the analytical program to evaluate groundwater samples associated with LOUs 22 and 23 associated piping are listed on **Table B – Groundwater Sampling and Analytical Plan for LOUs 22 and 23.**

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:

No soil gas samples will be collected in the vicinity of LOUs 22 and 23 associated piping in Area II to evaluate area conditions.

References:

1. ENSR, 2007a, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. ENSR, 2007b, Quarterly Performance Report for Remediation Systems, Tronox LLC, Henderson, Nevada, July-September 2007, November 2007.
3. Kleinfelder, 1993, Environmental Conditions Assessment, Kerr-McGee Chemical Corporation, Henderson, Nevada Facility, April 15, 1993 (Final).
4. Tronox, Susan Crowley, verbal communication, January 18, 2008.
5. Tronox, Susan Crowley, verbal communication, February 25, 2008.

Summary of Available Data for LOU 22 and LOU 23 (Pond WC-West and WC-East) Associated Piping in Area II

Tronox Facility – Henderson, Nevada

LOU Figure

J:\TronoxGIS\mxd\Phase_B_WorkPlan\LOUs\lou-22-23_Area-2.mxd

N

1:2,400
1 inch equals 200 feet
200 100 0 200
Feet

PIPELINE ROUTE
TO LOU #22 & #23

AREA II

AREA III

STEAM PLANT

9th STREET

10th STREET

11th STREET

8th STREET

AVENUE F

AVENUE G

AVENUE H

FORMER U.S. VANADIUM SITE (AREA 70)

LOU #13 BOUNDARY
LOU #9 BOUNDARY
LOU #14 BOUNDARY
LOU #7 BOUNDARY
LOU #8 BOUNDARY
LOU #19 BOUNDARY
LOU #16 BOUNDARY
LOU #18 BOUNDARY
LOU #20 BOUNDARY
POND C-1
LOU #17 BOUNDARY
LOU #53 BOUNDARY
LOU #45 BOUNDARY
LOU #34 BOUNDARY
LOU #21 BOUNDARY
POND Mn-1
LOU #24 BOUNDARY
LOU #46 BOUNDARY
LOU #50 BOUNDARY
LOU #49 BOUNDARY
LOU #47 BOUNDARY
LOU #48 BOUNDARY
LOU #34E BOUNDARY
LOU #51 PIPELINE
LOU #37 BOUNDARY
UNIT 6
UNIT 5
UNIT 4
LOU #15 BOUNDARY
LOU #11 BOUNDARY
LOU #12 BOUNDARY
LOU #43 BOUNDARY
LOU #61 BOUNDARY
LOU #33 BOUNDARY
LOU #44 BOUNDARY

BDB-05

LEGEND

- LOU of Interest
- LOU #59 Storm Sewer System with manholes and sumps with flow direction
- LOU #60 Acid Drain System with manholes and sumps with flow direction
- Other LOU Boundary
- Other LOU Associated Pipelines

Proposed Phase B Explorations for LOU

- Groundwater Monitoring Well Location
- Boring Location
- Soil Gas Location

Other Explorations

- Phase A Boring Location (Sep. 2007)
- Phase II BRC Sample Location (Oct. 2007)
- Historic Groundwater Monitoring Well Location (Dry)
- Historic Sample Location (pre 2006)
- Existing Well Location (No Proposed Sampling)
- Proposed Phase B Groundwater Location (Other LOU)
- Proposed Phase B Soil Boring Location (Other LOU)
- Proposed Phase B Soil Gas Location (Other LOU)
- Tronox Facility Boundary
- Area Boundary
- Parcel Boundary
- Four Acre Grid Line (Cell reference displayed as row-column, i.e. M-8)

Base Aerial Photo from PBS&J, October 2006

FIGURE NUMBER: 1
SHEET NUMBER: X

SAMPLE LOCATIONS FOR LOU #22 & #23 ASSOCIATED PIPING IN AREA II

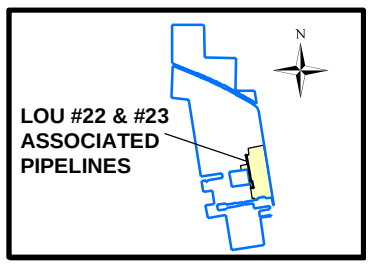
Phase B Area III Source Area Investigation
Tronox Facility
Henderson, Nevada

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	6/6/2008	04020-023-430

ENSR | AECOM

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

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
B. Ho	M. Scop	C. Schnell	B. Ho



Summary of Available Data for LOU 22 and LOU 23 (Pond WC-West and WC-East) Associated Piping in Area II

Tronox Facility – Henderson, Nevada

Sampling and Analytical Plans for LOUs 22 and 23:

Table A – Soil Analytical Plan for LOUs 22 and 23
Table B – Groundwater Analytical Plan for LOUs 22 and 23

Table A
Soil Sampling and Analytical Plan for LOUs 22 and 23 in Area II
Phase B Source Area Investigation Work Plan
Tronox Facility - Henderson, Nevada

Grid Location	LOU Number	Phase B Boring No.	Sample ID Number	Sample Depths[1.] (ft. bgs)	Perchlorate (EPA 314.0)	Metals (EPA 6020)	Hex Cr (EPA 7199)	TPH-DRO/ORO (EPA 8015B)	TPH-GRO (EPA 8015B)	VOCs[2.] (EPA 8260B)	Wet Chemistry[3.]	Total Cyanide (EPA 9012A)	OCPs[4.] (EPA 8081A)	SVOCs[5.] (EPA 8270C)	Radio-nuclides[6.]	Dioxins/ Furans[7.]	Asbestos[9.] EPA/540/R-97/028	Geo-technical Tests[10.]	Rationale
Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 2 (M-2) and ending with the southeastern most grid in Area 2 (S-7).																			
M-7	22, 23, 57	SA155	SA155-0.0	0.0													X		Boring located to evaluate LOU 22 (Pond WC-West Associated Piping), LOU 23 (Pond WC-East Associated Piping),
M-7	22, 23, 57		SA155-0.5	0.5	X	X	X			X	X		X		X	X			and LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines).To evaluate
M-7	22, 23, 57		SA155-10	10	X	X	X			X	X		X		X				potiential LOU 22 and 23 piping releases and for general stepout coverage of LOU 57.
N-7	5, 20, 22, 23	RSAN7	RSAN7-0.0	0.0													X		Boring located to evaluate LOU 5 (Beta Ditch), LOU 20 (Pond C-1 and Associated Piping), LOU 22 (Pond WC-West
N-7	5, 20, 22, 23		RSAN7-0.5	0.5	X	X	X	X		X	X		X	X	X	X			Associated Piping), and LOU 23 (Pond WC-East Associated Piping). Randomly located in a low spot of the Eastern
N-7	5, 20, 22, 23		RSAN7-10	10	X	X	X	X		X	X		Hold	X	X				Diversion Ditch of LOU 5 to evaluate possible releases and overflow runoff from LOU 20. Also to evaluate potential
N-7	5, 20, 22, 23		RSAN7-20	20	X	X	X	X		X	X		Hold	X	X				releases from LOUs 22 and 23 piping.
N-7	5, 20, 22, 23		RSAN7-30	30	X	X	X	X		X	X		Hold	X	X				
N-7	5, 20, 22, 23		RSAN7-35	35	X	X	X	X		X	X		X	X	X				
Number of Samples:					**7**	**7**	**7**	**5**	**0**	**7**	**7**	**0**	**4**	**5**	**7**	**2**	**2**	**0**	

Notes:

n/a	Not applicable - boring is not associated with a specific LOU but is located to evaluate soil for general area-wide coverage.
X	Sample will be collected and analyzed.
	No sample collected under Phase B sampling program.
DD*	Sample depth to be determined in the field where DD = sample depth (ft).
TPH-DRO/ORO	Total petroleum hydrocarbons - Diesel-Range Organics/Oil-Range Organics.
1.	The 0.5 ft bgs sample will be collected from the 0.0 to 0.5 ft bgs interval, unless the area is paved. If area is paved, samples will be collected at 0.5 feet below or from a representative depth beneath the pavement. Alternately, if an unpaved area is within a reasonable distance, the sample will be moved to the unpaved area.
2.	Samples for VOC analysis will be preserved in the field using sodium bisulfate (or DI water) and methanol preservatives per EPA Method 5035.
3.	Consists of wet chemistry parameters (including pH) listed on Table 1 of the Phase B Source Area Work Plan.
4.	Organochlorine Pesticides (includes analysis for hexachlorobenzene).
5.	Semi-volatile Organic Compounds
6.	Radionuclides consists of alpha spec reporting for isotopic thorium and isotopic uranium, and Radium-226, plus Radium-228 by beta counting (per NDEP).
7.	Dioxins/furans will be analyzed by EPA Method 8290 for all samples. Screening reports will be provided for 90% of the samples and full data packages for 10% of the samples.
8.	Polychlorinated biphenyls
9.	Soil samples for asbestos analyses will be collected from a depth of 0 to 2-inches bgs.
10.	Geotechnical Tests consist of: moisture content (ASTM D-2216), grain size analysis (ASTM D-422 and C117-04), Soil Dry Bulk Density (ASTM D-2937), Grain Density (ASTM D-854, Soil-Water Filled Porosity (ASTM D-2216); Vertical Hydraulic Conductivity (ASTM D-5084/USEPA 9100).
11.	SPLP samples will be analyzed by EPA method 1312 using two preparation methods: 1) with extraction fluid #2 (reagent water at pH 5.0±0.05), and 2) with extraction method #3 (reagent water); per NDEP.

Table B
Groundwater Sampling And Analysis Plan for LOUs 22 and 23 in Area II
Phase B Source Area Investigation Work Plan
Tronox Facility - Henderson Nevada

Grid Location	Location Area	Monitoring Well No.	Screen Interval (ft bgs)	Soil Type Expected Across Screen Interval[1]	Well Sampled for Phase A? (y/n)	Perchlorate (EPA 314.0)	Hex Cr (EPA 7199)	Metals	VOCs[2] (EPA 8260)	Wet Chemistry (a)	OCPs[3] (EPA 8081A)	SVOCs[4] (EPA 8270C)	Radionuclides[5]	Rationale
Wells are organized by grid location as shown on Plate A - Starting point is on the northwestern-most grid in Area II (L-4) and ending with the southeastern-most grid covering Area II (S-7).														
M8	IIN	M-39	24.9 - 39.9	Qal/MCfg1	yes	X	X	X	X	X	X	X	X	Located as a downgradient stepout for LOUs 5, 20, 22 (pipelines in Area II) and LOU 23 (pipelines in Area II); and for general Site coverage.
M8	II	M-19	14.5 - 34.5	Qal/MCfg1	no	X	X	X	X	X	X	X	X	Located to serve as an upgradient stepout for LOUs 5 and 20; to evaluate LOUs 22 and 23 and potential offsite sources to the east; and as general Site coverage.
N6	II	M-2A*	nr	nr	yes	X	X	X	X	X	X	X	X	Located as a downgradient stepout for LOUs 7, 8, 9, 13, 14, 20, 34, and 45; as an upgradient stepout for LOUs 16, 17, 18, 22, 23, 53, and 57; and for general Site coverage.
N6	II	M-17A	35 - 45	Qal/MCfg1	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 57; as an upgradient stepout for LOUs 5, 16, 17, 18, 22, and 23; and for general Site coverage.
N7	II	M-34	25 - 40	Qal/MCfg1	no	X	X	X	X	X	X	X	X	Located to evaluate the outfall of the culvert that empties into the Eastern Diversion segment of LOU 5; as a downgradient stepout for LOUs 13 and 14 as un upgradient step out for LOUs 20, 22, and 23; and for general Site coverage.
				Number of Field Samples:		**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	

Notes:

* Well completion information or boring log not available. Soil type inferred from nearby wells and geologic cross-section provided in the Phase A Source Area Investigation Report (ENSR 2007). ENSR is in the process of obtaining information from BMI.
X Sample will be collected and analyzed.
1 It is anticipated that the large majority of the flow to the well will be from the coarse-grained sediments. As such, in the cases where there are two lithologies present across the screen interval, the water sampled will represent conditions in the coarse-grained interval.
2 VOCs = Volatile organic compounds (to include analysis for naphthalene).
3 OCPs = Organochlorine pesticides (to include analysis for hexachlorobenzene).
4 SVOCs = Semi volatile organic compounds.
5 Radionuclides consists of alpha spec reporting for isotopic Thorium and isotopic Uranium, and Radium-226, plus Radium-228 by beta counting (per NDEP).
IIIN/E/W/S Well located outside (north, east, west, or south) of Area II.
nr Not recorded in the All Wells Database (June 2008).
TBD To be determined when well is constructed
(a) Complete list of wet chemistry parameters are shown on Table 1. All groundwater samples will have pH measured in the field.
Qal Quaternary Alluvium
MCfg1 Muddy Creek Formation - first fine-grained facies
MCcg1 Muddy Creek Formation - first coarse-grained facies

Summary of Available Data for LOU 22 and LOU 23 (Pond WC-West and WC-East) Associated Piping in Area II

Tronox Facility – Henderson, Nevada

Groundwater Characterization Data

Summary of Available Data for LOU 22 and LOU 23 (Pond WC-West and WC-East) Associated Piping in Area II

Tronox Facility – Henderson, Nevada

LOU-specific analytes identified include:

- Wet chemistry analytes
- Metals
- Perchlorate
- Radionuclides
- Chlorate
- Hexavalent Chromium

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

LOUs 22 and 23 Table 1 - Groundwater Characterization Data – Routine Monitoring

LOUs 22 and 23 Table 2 – Summary of Analytical Data for Well M-34

LOUs 22 and 23 Table 3 - Summary of Analytical Data for Well M-2A

LOUs 22 and 23 Table 4 - Summary of Analytical Data for Wells M-17 and M-17A

LOUs 22 and 23 Table 5 – Manganese and Additional Groundwater Analytical Data

LOUs 22 and 23 Table 6 – Summary of Analytical Data for Wells M-19 and M-39

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

LOUs 22 & 23 Table 1
Groundwater Characterization Data - Routine Monitoring [1]

Pond WC-West and Pond WC-East Associated Piping in Area II
Tronox Facility - Henderson, Nevada

Well ID	Date	Depth to water (ft)	Perchlorate mg/L	Qual	MCL [2] mg/L		Total Chromium mg/L	Qual	MCL [2] mg/L	TDS mg/L	Qual	MCL [2] mg/L	Nitrate (as N) mg/L	Qual	MCL [2] mg/L	Chlorate mg/L	Qual	MCL [2] mg/L
M-2A	5/5/2006	---	430	d	1.80E-02	a,m	18	d	1.00E-01	12100		5.00E+02	j			1.00E+01			--
M-2A	5/4/2007	---	362		1.80E-02	a,m	17		1.00E-01	10200		5.00E+02	j			1.00E+01			--
M-17A	2/3/2006	32.38	860	d	1.80E-02	a,m	28	d	1.00E-01			5.00E+02	j			1.00E+01			--
M-17A	5/5/2006	32.64	810	d	1.80E-02	a,m	29	d	1.00E-01	16200		5.00E+02	j			1.00E+01			--
M-17A	8/4/2006	33.02	788	d	1.80E-02	a,m	29	d	1.00E-01	10400		5.00E+02	j			1.00E+01			--
M-17A	11/3/2006	33.04	775	d	1.80E-02	a,m	28	d	1.00E-01	13830		5.00E+02	j			1.00E+01			--
M-17A	2/2/2007	32.91	788		1.80E-02	a,m	28		1.00E-01	14300		5.00E+02	j			1.00E+01			--
M-17A	5/4/2007	32.99	671		1.80E-02	a,m	28		1.00E-01	12800		5.00E+02	j			1.00E+01			--
M-17A	8/3/2007	33.41	974		1.80E-02	a,m	27		1.00E-01	13800	J-	5.00E+02	j			1.00E+01			--
M-19	2/2/2006	31.67	1	d	1.80E-02	a,m	0.2	d	1.00E-01			5.00E+02	j			1.00E+01			--
M-19	5/3/2006	33.14	0.96	d	1.80E-02	a,m	0.19	d	1.00E-01	2950		5.00E+02	j			1.00E+01			--
M-19	8/2/2006	34.11	0.91	d	1.80E-02	a,m	0.22	d	1.00E-01	2650		5.00E+02	j			1.00E+01			--
M-19	11/1/2006	35.72	1.83	d	1.80E-02	a,m	0.32	d	1.00E-01	3670		5.00E+02	j			1.00E+01			--
M-19	1/31/2007	34.92	1.9		1.80E-02	a,m	0.29		1.00E-01	3740		5.00E+02	j			1.00E+01			--
M-19	5/2/2007	34.51	1.91		1.80E-02	a,m	0.34		1.00E-01	3720		5.00E+02	j			1.00E+01			--
M-19	8/1/2007	34.93	2.49		1.80E-02	a,m	0.38		1.00E-01	4820		5.00E+02	j			1.00E+01			--
M-34	2/2/2006	---	1800	d	1.80E-02	a,m	17	d	1.00E-01			5.00E+02	j			1.00E+01			--
M-34	5/3/2006	---	1700	d	1.80E-02	a,m	18	d	1.00E-01	8960		5.00E+02	j			1.00E+01			--
M-34	5/7/2006	40.86	1950	d	1.80E-02	a,m			1.00E-01	14500		5.00E+02	j			1.00E+01			--
M-34	8/2/2006	---	1550	d	1.80E-02	a,m	18	d	1.00E-01	7430		5.00E+02	j			1.00E+01			--
M-34	11/1/2006	---	1910	d	1.80E-02	a,m	18	d	1.00E-01	10900		5.00E+02	j			1.00E+01			--
M-34	1/31/2007	---	1860		1.80E-02	a,m	17		1.00E-01	12000		5.00E+02	j			1.00E+01			--
M-34	5/2/2007	37.52	1670		1.80E-02	a,m	17		1.00E-01	9850		5.00E+02	j			1.00E+01			--
M-34	8/1/2007	---	2130		1.80E-02	a,m	16		1.00E-01	11900		5.00E+02	j			1.00E+01			--
M-39	2/2/2006	30.42	380	d	1.80E-02	a,m	4	d	1.00E-01			5.00E+02	j			1.00E+01			--
M-39	5/3/2006	30.36	320	d	1.80E-02	a,m	3.7	d	1.00E-01	4300		5.00E+02	j	2.6	d	1.00E+01	1100	d	--
M-39	8/2/2006	31.20	320	d	1.80E-02	a,m	4.3	d	1.00E-01	4560		5.00E+02	j	3.5	d	1.00E+01	1220	d	--
M-39	11/1/2006	31.53	400	d	1.80E-02	a,m	4.5	d	1.00E-01	6310		5.00E+02	j	10.8	d	1.00E+01	1370	d	--
M-39	1/31/2007	31.78	390		1.80E-02	a,m	4.5		1.00E-01	6730		5.00E+02	j			1.00E+01			--
M-39	5/2/2007	31.67	403		1.80E-02	a,m	4.7		1.00E-01	6990		5.00E+02	j	10.3		1.00E+01	1380		--
M-39	8/1/2007	32.10	489		1.80E-02	a,m	4.6		1.00E-01	7280		5.00E+02	j			1.00E+01			--

Notes:
1. ENSR, 2007, Quarterly Performance Report for Remediation Systems, Tronox LLC, Henderson, Nevada, July-September 2007, November 2007.
2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
(a) NAC 445A.455 Secondary standards. Certain provisions of the National Primary Drinking Water Regulations are adopted by reference (NAC 445A.4525). These values are listed in the first column of this table and are therefore not listed again here. Only NAC 445A.455 Secondary standards are listed.
(m) Equal to the provisional action level derived by NDEP as referenced in "Defining a Perchlorate Drinking Water Standard". NDEP Bureau of Corrective Action. URL [http://ndep.nv.gov/bca/perchlorate02_05.htm].
(j) Secondary Drinking Water Regulation value.

< = less than the reporting limit
Blank cell or --- = no data and or no qualifier
Qual = data qualifiers applied by laboratory or during data validation
TDS = Total Dissolved Solids
mg/l = milligram per liter

Laboratory Qualifiers:
d = the sample was diluted

LOUs 22 & 23 Table 2
Summary of Analytical Data for Well M-34

Pond WC-West and Pond WC-East Associated Piping in Area II
Tronox Facility - Henderson, Nevada

WELL #	Sample Date	Total Depth (ft bgs)	Depth to Water (ft TOC)	pH (Lab)	EC (Lab, µmho/cm)	Mn (ppm)	LAB	Well Location from LOUs (Approximate)
M-34	5/6/99	42.39	36.69	7.04	19500	0.8	KMC	280 ft NW of LOU 24 425 ft NE of LOU 34
M-34	5/5/00	42.39	37.44	7.22	18900	0.83	KMC	
M-34	5/4/01	42.39	37.52	7.21	16400	0.76	KMC	
M-34	4/29/02	42.39	36.38	7.2	14370	0.23	MW	

Notes:

ft bgs = feet below ground surface
µmho/cm = micromhos per centimeter
ppm = parts per million
ft TOC = feet from Top of Casing
EC = Electrical Conductivity
Mn = Manganese
-- = Either no data was obtained or was not analyzed for the respective constituent.
Labs: KMC Kerr-McGee Chemical Corporation
MW Montgomery Watson
ND<0.15 = Not determined, not detected above the designated detection limit, i.e. 0.15.
Source: Kerr-McGee Chemical Corporation, Mother-hen Database.

LOUs 22 & 23 Table 3
Summary of Analytical Data for Well M-2A

Pond WC-West and Pond WC-East Associated Piping in Area II
Tronox Facility - Henderson, Nevada

WELL #	Sample Date	Total Depth (ft bgs)	Depth to Water (ft TOC)	pH (Lab)	EC (Lab, µmho/cm)	Cr-total (ppm)	ClO_4 (ppm)	LAB
M-2A	8/24/97	--	--	--	--	--	650	KMC
M-2A	9/15/97	--	41.02	7.31	13000	--	--	KMC
M-2A	4/27/98	46.71	41.41	7.28	6180	--	740	KMC
M-2A	5/6/99	46.71	41.09	7.29	10900	20	800	KMC
M-2A	5/5/00	46.71	41.78	7.39	14400	29	780	KMC
M-2A	5/4/01	46.71	41.85	7.43	11700	25	580	KMC
M-2A	4/30/02	--	40.55	7.3	12660	24	560	MW
M-2A	4/30/03	--	41.37	--	14470	--	690	MW
M-2A	5/6/04	--	--	7.3	13700	29	700	MW

Notes:

ft bgs = feet below ground surface
µmho/cm = micromhos per centimeter
ppm = parts per million
ft TOC = feet from Top of Casing
EC = Electrical Conductivity
Cr-total: Total Chromium
ClO_4: Perchlorate
-- = Either no data was obtained or was not analyzed for the respective constituent.
Labs: KMC Kerr-McGee Chemical Corporation
MW Montgomery Watson

Source: Kerr-McGee Chemical Corporation, Mother-hen Database.

LOUs 22 & 23 Table 4
Summary of Analytical Data for Wells -M17 and M-17A

Pond WC-West and Pond WC-East Associated Piping in Area II
Tronox Facility - Henderson, Nevada

Analysis of Water for Nitrates

Well #	Sample Date	Nitrates (mg/l) EPA Method	Comments
M-17	1997	509	Nitrate or nitrite as nitrogen

Periodic Analysis of Water from Key nearby Wells

Well #	Sample Date	Total Depth (ft bgs)	Depth to Water (ft TOC)	pH (Lab)	EC (Lab, µmho/cm	Cr-total (ppm)	ClO_4 (ppm)	LAB
M-17	1/1/96	43.05	34.72	7.30	10720	--	40	--
M-17	2/1/96	43.05	34.92	7.17	13210	--	50	--
M-17	3/1/96	43.05	34.82	7.34	10940	--	50	--
M-17	8/24/97	43.05	--	--	--	--	880	KMC
M-17	9/15/97	43.05	34.55	7.34	9410	--	--	KMC
M-17	4/27/98	43.05	34.22	7.42	9510	--	1300	KMC
M-17	5/6/99	43.05	34.63	7.17	19400	39	1550	KMC
M-17	5/5/00	43.05	35.35	7.16	21900	40	2200	KMC
M-17	1/25/01	43.05	35.57	7.10	23100	--	1700	KMC
M-17	2/20/01	43.05	35.53	7.22	22100	--	1500	KMC
M-17	3/29/01	43.05	35.30	7.10	22350	--	1500	KMC
M-17	4/25/01	43.05	35.35	7.19	22400	--	1600	KMC
M-17	5/15/01	43.05	35.43	7.10	22400	--	1600	KMC
M-17	6/22/01	43.05	37.05	7.20	22400	--	1500	KMC
M-17	7/24/01	43.05	35.26	7.20	21700	--	1600	KMC
M-17A	6/20/03	55.00	32.91	--	8340	--	472	KMC
M-17A	5/7/04	55.00	--	7.20	17260	42	1000	MW
M-17A	8/4/04	55.00	--	7.40	16370	37	970	MW

Notes:

mg/l = milligrams per liter
ft bgs = feet below ground surface
ppm = parts per million
µmho/cm = micromhos per centimeter
ft TOC = feet from Top of Casing
ClO_4: Perchlorate
EC = Electrical Conductivity
-- = Either no data was obtained or was not analyzed for the respective constituent.

Labs: KMC Kerr-McGee Chemical Corporation
MW Montgomery Watson

Sources:

Nitrate and 1996 well data from Kerr-McGee, Response to LOU Comments, 1996; and Kerr-McGee Chemical Corporation, Mother-hen Database.

LOUs 22 & 23 Table 5
Manganese & Additional Groundwater Analytical Data

Pond WC-West and Pond WC-East Associated Piping in Area II
Tronox Facility - Henderson, Nevada

WELL #	Sample Date	Total Depth (ft bgs)	Depth to Water (ft TOC)	Mn (ppm)	pH (Lab)	EC (Lab, µmho/cm)	Cr^{+6} (ppm)	Cr-total (ppm)	ClO_4 (ppm)	LAB
M-19	5/6/99	39.54	33.03	0.7	7.14	12,000	--	0.62	13	KMC
M-19	5/5/00	39.54	34.50	0.34	7.62	11,300	--	0.71	7.4	KMC
M-19	5/4/01	39.54	35.06	0.08	7.38	10,700	--	0.88	0.056	KMC
M-19	4/29/02	39.54	34.02	0.17	7.3	8,360	--	0.45	6.8	MW
M-34	5/6/99	42.39	36.69	0.8	7.04	19,500	--	28	1,500	KMC
M-34	5/5/00	42.39	37.44	0.83	7.22	18,900	--	30	1,700	KMC
M-34	5/4/01	42.39	37.52	0.76	7.21	16,400	--	33	2,100	KMC
M-34	4/29/02	42.39	36.38	0.23	7.2	14,370	--	28	2,000	MW
M-39	5/6/99	42.12	30.59	0.44	7.45	8,080	--	2.4	140	KMC
M-39	5/5/00	42.12	31.70	1.6	7.54	7,680	--	2.8	190	KMC
M-39	5/2/01	42.12	32.10	1.8	7.34	7,620	--	3.3	280	KMC
M-39	3/11/02	42.12	--	0.06	--	--	--	--	--	--
M-39	4/29/02	42.12	20.60	ND <0.15	7.3	7,700	--	13	450	MW
M-39	9/9/02	42.12	--	ND <0.15	--	--	--	--	--	--
M-39	12/10/02	42.12	--	ND <0.15	--	--	--	--	--	--
M-39	5/7/03	42.12	--	ND<0.15	--	--	--	--	--	--

Notes:

µmho/cm = micromhos per centimeter
ppm = parts per million
ft bgs = feet below ground surface
ft TOC = feet from Top of Casing
ND = Not determined
EC: Electrical Conductivity
Cr^{+6}: Hexavalent Chromium
Cr-total: Total Chromium
Mn = Manganese
ClO_4: Perchlorate

ND<0.15 = Not determined, not detected above the designated detection limit, i.e. 0.15
-- = Either no data was obtained or was not analyzed for the respective constituent.

Labs: KMC Kerr-McGee Chemical Corporation
MW Montgomery Watson
NEL Nevada Environmental Laboratory

Source: Kerr-McGee Chemical Corporation, Mother-hen Database.

LOUs 22 & 23 Table 6
Summary of Analytical Data for Wells M-19 and M-39

Pond WC-West and Pond WC-East Associated Piping in Area II
Tronox Facility - Henderson, Nevada

WELL #	Sample Date	Total Depth (ft bgs)	Depth to Water (ft TOC)	pH (Lab)	EC (Lab, µmho/cm)	Cr-total (ppm)	Mn (ppm)	ClO_4 (ppm)	LAB
M-19	5/6/99	39.54	33.03	7.14	12000	0.62	0.70	13.0	KMC
M-19	5/5/00	39.54	34.50	7.62	11300	0.71	0.34	7.360	KMC
M-19	5/4/01	39.54	35.06	7.38	10700	0.88	0.08	0.056	KMC
M-19	4/29/02	39.54	34.02	7.3	8360	0.45	0.17	6.8	MW
M-39	5/6/99	42.12	30.59	7.45	8080	2.40	0.44	140	KMC
M-39	5/5/00	42.12	31.70	7.54	7680	2.80	1.60	190	KMC
M-39	5/2/01	42.12	32.10	7.34	7620	3.30	1.80	280	KMC
M-39	3/11/02	42.12	--	--	--	--	0.06	--	--
M-39	4/29/02	42.12	20.60	7.3	7700	13	ND <0.15	450	MW
M-39	9/9/02	42.12	--	--	--	--	ND <0.15	--	--
M-39	12/10/02	42.12	--	--	--	--	ND <0.15	--	--
M-39	5/7/03	42.12	--	--	--	--	ND<0.15	--	--

Notes:

ft bgs = feet below ground surface
ppm = parts per million
µmho/cm = micromhos per centimeter
ft TOC = feet from Top of Casing
EC = Electrical Conductivity
Cr-total: Total Chromium
Mn = Manganese
ClO_4: Perchlorate

ND<0.15 = Not determined, not detected above the designated detection limit, i.e. 0.15
-- = Either no data was obtained or was not analyzed for the respective constituent.

Labs: KMC Kerr-McGee Chemical Corporation
MW Montgomery Watson

Source: Kerr-McGee Chemical Corporation Mother-hen Database.

LOUs 22 & 23
Notes for Phase A Data Tables

Pond WC-West and Pond WC-East Associated Piping in Area II
Tronox Facility - Henderson, Nevada

Blank	Not analyzed.
Bold	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.
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	Soluable 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
pCi/L	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.
--	Not established