# Summary of Available Data for LOU 42
# Unit 2 Salt Conveyor
Tronox Facility – Henderson, Nevada

**Name of Facility:** **Unit 2 Salt Conveyor**

**Goal of Closure:**
- Closure for future commercial/industrial use.

**Site Investigation Area:**
- Size: Approximately 20 feet by 120 feet [Ref. 4].
- Location: Southeast corner of Unit 2 [Ref. 4].
- Current Status/Features: This LOU is no longer active and the equipment has been removed from the area.

**Description:**
- A rubber belt conveyor was used on a temporary basis to transfer sodium chloride salt into rail cars at a rail siding adjacent the southeast corner of Unit 2 [Ref. 1]. A small portion of the salt stored in Unit 2 was shipped to another out-of-state facility [Ref. 3].
- Transfer of salt from Unit 2 to the conveyor belt was accomplished by front-end loader [Ref. 1]. The conveyor loaded the salt into the rail cars [Ref. 4].
- Most of the salt in Unit 2 was eventually used as feedstock for the on-site sodium chlorate plant [Ref. 4].
- The conveyor belt was operational in the early 1990s [Ref. 4].
- Spilled salt was swept up and returned to the Unit 2 salt storage [Ref. 1].

| Process Waste Streams Associated with LOU 42 | Known or Potential Constituents Associated with LOU 42 |
|---|---|
| Spillage of salt during transfer | • Salt (sodium chloride) |

**Overlapping and Adjacent LOUs:**

The following LOUs overlap or are adjacent to LOU 42:

Overlapping LOUs

- None

Adjacent LOUs

- LOU 36 (Former Satellite Accumulation Point, Unit 3, Maintenance Shop) – Located east (cross-gradient) of LOU 42.
- LOU 59 (Storm Sewer System) –- A branch of LOU 59 runs north-south along Seventh Street approximately 50 feet east of LOU 42.

LOUs 36 and 59 are cross-gradient of LOU 42 and no releases are known to have occurred from either LOU; therefore, they are not considered to affect LOU 42. As a result, the addition of other chemical classes related to the

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Tronox Facility – Henderson, Nevada

| | |
|---|---|
| | Phase B Analytical Plan for LOU 42 is not required.<br>For detailed information on the LOUs listed above, please refer to the specific LOU data package. |
| **Other LOUs Potentially Affecting Soils in LOU 42:** | • None |
| **Known or Potential Chemical Classes:** | • Wet chemistry analytes |
| **Known or Potential Release Mechanisms:** | • Potential impacts to surrounding soils from surface releases.<br>• Salt spills to the ground from the Unit 2 Salt Conveyor occurred regularly; however, they were routinely swept up and removed before the salt could dissolve [Ref 1].<br>• Rainwater could dissolve the salt and transport the solution to subsurface soils and nearby storm sewers [Ref. 1]. |
| **Results of Historical Sampling:** | • No known historical soil sampling was identified in the documents reviewed.<br>• Downgradient monitoring wells (M-97 and M-13) are routinely tested for perchlorate, total chromium, TDS, nitrate, and chlorate as part of a routine groundwater monitoring program [Ref. 4]. Results from routine groundwater monitoring are presented in LOU 42 Table 1. |
| **Did Historical Samples Address Potential Release?** | • No |
| **Summary of Phase A SAI:** | <u>Soil</u><br>• None specifically conducted for this LOU. The closest soil boring (SA04) is approximately 440 feet north (downgradient) of LOU 42 and was not specifically sampled to evaluate this LOU [Ref. 2].<br><u>Groundwater</u><br>• None specifically conducted for this LOU. The closest well sampled (M-13) is approximately 450 feet northeast (downgradient) of LOU 42 and was not specifically sampled to evaluate this LOU [Ref. 2].<br><br>Boring SA04 is located a significant distance from LOU 42; therefore, the constituents detected in this boring are not representative of soil conditions at LOU 42. |

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**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 Source Area Investigation of LOU 42 consists of drilling one judgmental soil boring (SA135) within the boundaries of LOU 42.
- The proposed soil boring along with the analytical program to evaluate soil samples from LOU 42 are listed on **Table A – Soil Sampling and Analytical Plan for LOU 42.**

**Proposed Phase B Constituents List for Soils:**

The judgmental sample location (SA135) will be analyzed for LOU-specific constituents consisting of the following:

- Wet chemistry analytes

The judgmental sample location (SA135) will also be analyzed for the following constituents for area-wide coverage purposes:

- Metals (Phase A list)
- Perchlorate
- Hexavalent chromium
- Radionuclides
- Dioxins/furans
- Asbestos

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

- The Phase B groundwater investigation of LOU 42 consists of collecting groundwater samples from four locations to evaluate local groundwater conditions and as part of a Site-wide evaluation of constituent trends in groundwater.
  - Well M-144 within LOU 42 will be used to evaluate local and area-wide groundwater conditions.
  - Three (3) wells (M-143, M-97, and M-13) located north (downgradient) of LOU 42 will be sampled.
  - All four wells along with the analytical program to evaluate groundwater samples associated with LOU 42 are listed **on Table B – Groundwater Sampling and Analytical Plan for LOU 42.**

**Proposed Phase B Constituents List for Groundwater:**

Groundwater samples will be analyzed for the following analytes:

- Metals (Phase A list)
- Hexavalent chromium

# Summary of Available Data for LOU 42
## Unit 2 Salt Conveyor
Tronox Facility – Henderson, Nevada

- Perchlorate
- Wet chemistry analytes
- VOCs
- SVOCs
- Organochlorine pesticides
- Radionuclides

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

- None proposed specifically for this LOU.

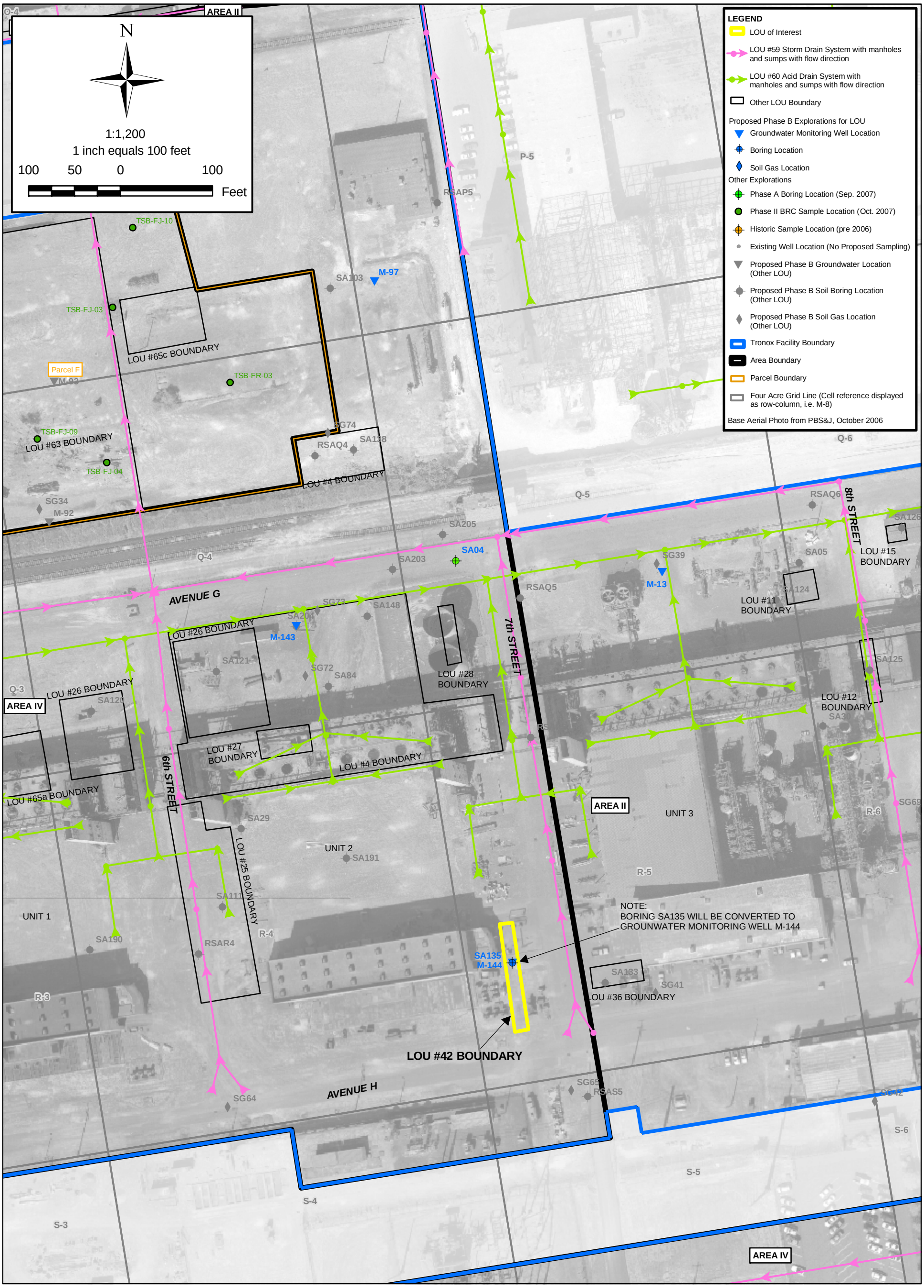
**References:**

1. Kleinfelder, 1993, Environmental Conditions Assessment, Kerr-McGee Chemical Corporation, Henderson, Nevada Facility, April 15, 1993 (Final)
2. ENSR, 2007a, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
3. Environmental Answers, Email Communication, May 13, 2008.
4. Tronox, Susan Crowley, Verbal Communication, May 12, 2008.

# Summary of Available Data for LOU 42
# Unit 2 Salt Conveyor
Tronox Facility – Henderson, Nevada

## LOU Figure

J:\TronoxGIS\mxd\Phase_B_WorkPlan\LOUs\lou-42.mxd




| | | |
|---|---|---|
| SHEET NUMBER: X | 1 | FIGURE NUMBER: |

## SAMPLE LOCATIONS FOR LOU #42
## UNIT 2 SALT CONVEYOR

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

| SCALE: | DATE: | PROJECT NUMBER: |
|---|---|---|
| AS SHOWN | 5/14/2008 | 04020-023-430 |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|---|---|
| DESIGNED BY: | B. Ho |
| DRAWN BY: | M. Scop |
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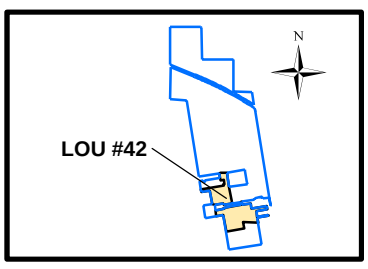

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**Sampling and Analytical Plans for LOU 42:**

Table A – Soil Sampling and Analytical Plan for LOU 42
Table B – Groundwater Sampling and Analytical Plan for LOU 42

**Table A**
**Soil Sampling and Analytical Plan for LOU 42**
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) | VOCs[2.] (EPA 8260B) | Wet Chemistry[3.] | Total Cyanide (EPA 9012A) | OCPs[4.] (8081A) | SVOCs[5.] (EPA 8270C) | Radio-nuclides[6.] | Dioxins/ Furans[7.] | PCBs[8.] (EPA 1668) | Asbestos[9.] EPA/540/R-97/028 | Geo-technical Tests[10.] | Location Description and Characterized Area Rationale |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Borings are organized by grid location as shown on Plate A - Starting point is on the grid R-5.** | | | | | | | | | | | | | | | | | | | |
| R-5 | 42 | SA135 | SA135-0.0 | 0.0 | | | | | | | | | | | | | X | | Boring located in LOU 42 to evaluate local soil impacts due to potential releases. |
| R-5 | 42 | | SA135-0.5 | 0.5 | X | X | X | | | X | | X | | X | X | | | | |
| R-5 | 42 | | SA135-10 | 10 | X | X | X | | | X | | Hold | | X | | | | | |
| R-5 | 42 | | SA135-20 | 20 | X | X | X | | | X | | Hold | | X | | | | | |
| R-5 | 42 | | SA135-30 | 30 | X | X | X | | | X | | Hold | | X | | | | | |
| R-5 | 42 | | SA135-40 | 40 | X | X | X | | | X | | X | | X | | | | | |
| **Number of Borings:** | | 1 | | | | | | | | | | | | | | | | | |
| **Number of Samples:** | | | | | 5 | 5 | 5 | 0 | 0 | 5 | 0 | 2 | 0 | 5 | 1 | 0 | 1 | 0 | |

**Notes:**

X Sample will be collected and analyzed.
No sample collected under Phase B sampling program.

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

1. If area is paved, samples will be collected at 0.5 feet below, or 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 Thorium-230/232, Uranium 234/235, Uranium-238, and beta spec for Radium-226/228 (per NDEP).
7. Dioxins/furans: 90% will be tested by immunoassay, 10% analyzed by HRGC/HRMS in the laboratory.
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).

**Table B**
**Groundwater Sampling and Analysis Plan for LOU 42**
Phase B Source Area Investigation Work Plan
Tronox Facility - Henderson, Nevada


| Grid Location | Location Area | Monitoring Well No. | Sample ID Number | 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) | Total Cyanide (EPA 9012A) | OCPs[3] (EPA 8081A) | SVOCs[4] (EPA 8270C) | Radio-nuclides[5] | Rationale |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Wells are organized by grid location as shown on Plate A - Staring point is on grid P-5 and ending point on grid R-5.** | | | | | | | | | | | | | | | | |
| P-5 | IV | M-97 | M-97 | 35 - 45 | MCcg1 | yes | X | X | X | X | X | | X | X | X | Located to serve as a downgradient stepout for LOUs 4, 26, 27, 28, 42, and 59; and for general Site coverage. |
| Q-5 | II | M-13 | M-13 | 40-50 | MCfg1 | yes | X | X | X | X | X | X | X | X | X | Located to serve as a downgradient stepout for LOUs 42, 59, and 60 and for general site coverage. |
| R-4 | IV | M-143 | M-143 | TBD | TBD | new well | X | X | X | X | X | | X | X | X | New well to be installed; located to evaluate LOUs 4, 25, 26, 27, 28, 42, and 60 for general Site coverage |
| R-5 | IV | M-144 | M-144 | TBD | TBD | new well | X | X | X | X | X | | X | X | X | New well to be installed; located to evaluate LOU 42 and for general site coverage. |
| | | | | | **Number of Field Samples:** | | 4 | 4 | 4 | 4 | 4 | 1 | 4 | 4 | 4 | |

**Notes:**

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 Thorium-230/232, Uranium 234/235, Uranium-238, and beta spec for Radium-226/228 (per NDEP).
(a) Complete list of wet chemistry parameters are shown on Table 1. All groundwater samples will have pH measured in the field.
TBD To be determined when well is constructed
MCfg1 Muddy Creek Formation - first fine-grained facies
MCcg1 Muddy Creek Formation - first coarse-grained facies
MCfg2 Muddy Creek Formation - second fine-grained facies

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# Unit 2 Salt Conveyor
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## Soil and Groundwater Characterization Data

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# Unit 2 Salt Conveyor
Tronox Facility – Henderson, Nevada

LOU-specific analytes identified include:

- Wet chemistry analytes

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

**LOU 42 Table 1 – Groundwater Characterization Data – Routine Monitoring**

**LOU 42 Table 1**

**Groundwater Characterization Data - Routine Monitoring[1]**

Unit 2 Salt Conveyor
Tronox Facility - Henderson, Nevada

| Well ID | Date | Depth to water (ft) | Perchlorate mg/L | Qual | MCL[2] ug/L | Total Chromium mg/L | Qual | MCL[2] ug/L | TDS mg/L | Qual | MCL[2] ug/L | Nitrate (as N) mg/L | Qual | MCL[2] ug/L | Chlorate mg/L | Qual | MCL[2] ug/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M-13 | 5/3/2006 | --- | 27 | d | 1.80E+01 a,m | 1.8 | d | 1.00E+02 | 2680 | | 5.00E+05 j | <0.1 | ud | 1.00E+04 | 390 | d | -- |
| M-13 | 5/3/2007 | --- | 18.6 | J | 1.80E+01 a,m | 0.8 | | 1.00E+02 | 3310 | J | 5.00E+05 j | 5.64 | d | 1.00E+04 | 255 | d | -- |
| M-97 | 2/3/2006 | 39.83 | 60 | d | 1.80E+01 a,m | 0.055 | d | 1.00E+02 | | | 5.00E+05 j | | | 1.00E+04 | | | -- |
| M-97 | 5/4/2006 | 39.89 | 61 | d | 1.80E+01 a,m | 0.06 | d | 1.00E+02 | 3640 | | 5.00E+05 j | | | 1.00E+04 | | | -- |
| M-97 | 8/2/2006 | 40.10 | 62 | d | 1.80E+01 a,m | 0.067 | d | 1.00E+02 | 3140 | | 5.00E+05 j | | | 1.00E+04 | | | -- |
| M-97 | 11/1/2006 | 40.07 | 80 | d | 1.80E+01 a,m | 0.072 | d | 1.00E+02 | 3600 | | 5.00E+05 j | | | 1.00E+04 | | | -- |
| M-97 | 1/31/2007 | 40.37 | 77.7 | | 1.80E+01 a,m | 0.066 | | 1.00E+02 | 3660 | | 5.00E+05 j | | | 1.00E+04 | | | -- |
| M-97 | 5/3/2007 | 40.43 | 76.8 | J | 1.80E+01 a,m | 0.063 | | 1.00E+02 | 3770 | J | 5.00E+05 j | | | 1.00E+04 | | | -- |
| M-97 | 8/1/2007 | 40.97 | 89.2 | | 1.80E+01 a,m | 0.61 | | 1.00E+02 | 3730 | | 5.00E+05 j | | | 1.00E+04 | | | -- |

**Notes:**

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

(j) Secondary Drinking Water Regulation value.

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

Laboratory Qualifiers:
d = the sample was diluted
ud = the sample was dilluted and was not detected above the sample reporting limit

Validation Qualifiers:
J = the result is an estimated quantity