

# STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Jim Gibbons, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

July 21, 2008

Susan Crowley  
Tronox LLC  
PO Box 55  
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**  
**NDEP Facility ID #H-000539**  
Nevada Division of Environmental Protection (NDEP) Response to:  
*Phase B Source Area Investigation Work Plan Area III (Eastern LOUs). Tronox LLC*  
*Facility, Henderson, Nevada*  
Dated June 27, 2008

Dear Ms. Crowley,

The NDEP has received and reviewed TRX's Phase B Area III Sampling Analysis Plan (SAP) identified above and finds the document acceptable with the conditions and comments provided in Attachment A.

Errata sheets should be submitted based on the comments found in Appendix A as noted. TRX should additionally provide an annotated response-to-comments (RTC) letter as part of the errata submittal. Alternately, in place of an RTC letter, TRX can discuss these comments with the NDEP in a meeting or via phone. Please advise the NDEP regarding the schedule for this submittal. Please note that it is NDEP's intent that TRX should be able to proceed with implementation of this SAP upon submittal of the errata and RTC letter (or completion of meeting with NDEP in lieu of the RTC letter).

Please contact the undersigned with any questions at [sharbour@ndep.nv.gov](mailto:sharbour@ndep.nv.gov) or (702) 486-2850 extension 240.

Sincerely,

Shannon Harbour, P.E.  
Staff Engineer III  
Bureau of Corrective Actions  
Special Projects Branch  
NDEP-Las Vegas Office

SH:bar:sh



CC: Jim Najima, NDEP, BCA, Carson City  
Brian Rakvica, NDEP, BCA, Las Vegas  
Keith Bailey, Environmental Answers LLC, 3229 Persimmon Creek Drive, Edmond, OK 73013  
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Barry Conaty, Akin, Gump, Strauss, Hauer & Feld, L.L.P., 1333 New Hampshire Avenue, N.W.,  
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Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011  
Mark Paris, Landwell, 875 West Warm Springs, Henderson, NV 89011  
Craig Wilkinson, TIMET, PO Box 2128, Henderson, Nevada, 89009-7003  
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015  
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409  
Nick Pogoncheff, PES Environmental, 1682 Novato Blvd., Suite 100, Novato, CA 94947  
Lee Erickson, Stauffer Management Company, P.O. Box 18890, Golden, CO 80402  
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Curt Richards, Olin Corporation, 3855 North Ocoee Street, Suite 200, Cleveland, TN 37312  
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209  
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island,  
WA 98110  
Teri Copeland, 5737 Kanan Road #182, Agoura Hills CA 91301  
Paul Hackenberry, Hackenberry Associates, LLC, 550 W. Plumb Lane B425, Reno, NV 89509  
Kelly Black, Neptune and Company, Inc., 8550 West 14<sup>th</sup> Street, Suite 100, Lakewood, CO 80215

**Attachment A**

1. General comment, NDEP has noted numerous typographic errors and cross-referencing errors in the text, tables, and figures of this document but will not list these in this response letter. TRX should review documents in greater detail and revise as necessary prior to submittal.
2. General comment, some site-wide changes to the sampling plan have been requested under separate cover. Please refer to separate letter dated July 21, 2008.
3. General comment, NDEP noted numerous errors in the Medium Specific Screening Levels (MSSLs), Maximum Contaminant Levels (MCLs), etc. listed in the tables of the main text and Appendix A LOU packages and notes the following (TRX should note that the following is not an exhaustive list):
  - a. TRX should review these values in greater detail and revise as necessary prior to the submittal of future documents.
  - b. The non-cancer endpoint MSSL for arsenic is used instead of the cancer endpoint MSSL.
  - c. TRX did not include the MSSL for titanium.
  - d. TRX did not include the MSSL for thallium.
  - e. TRX should use the values listed for the outdoor worker as these are more stringent. Indoor workers will be addressed using the indoor air pathway.
  - f. TRX should list the more stringent of the cancer vs. non-cancer endpoint MSSLs for each contaminant.
4. Section 1.0, page 1-2, it is the NDEP's expectation that TRX will meet with the NDEP to discuss the format of the final Phase B Source Area Investigation Report prior to submittal.
5. Section 1.1, page 1-3, 3<sup>rd</sup> paragraph, it is the NDEP's expectation that TRX will meet with the NDEP to discuss data usability prior to the submittal of the final Phase B Source Area Investigation Report.
6. Section 1.2, page 1-5, TRX lists the Phase A Investigation Results Report as a document of record. TRX should note that the NDEP accepted the submittal of the Phase B SAPs in lieu of TRX submitting a revised Phase A Report. Additionally, while the validated data presented in the Phase A Report was approved by the NDEP, the procedures/methodologies, recommendations, and conclusions in the Phase A Report were neither approved nor rejected by the NDEP.
7. Section 2.2.1, page 2-3, 2<sup>nd</sup> paragraph, TRX states that "If current operations do not exacerbate contamination, future closure may not require sampling for the full SRC list (i.e., if a chemical is not detected in the Phase B Source Area Investigation and is not a part of the process associated with the LOU, it may not be analyzed for at the time of closure)." The NDEP does not necessarily concur with this statement at this time and will review this issue at the time of closure.
8. Section 2.2.1, page 2-4, 4<sup>th</sup> paragraph, TRX should include discussion on groundwater as a source of continuing soil contamination.
9. Section 2.3.2, page 2-6, 1<sup>st</sup> bullet, NDEP has added PCBs and TPH DRO/ORO analysis to any borings located in the vicinity of Western Area Power Administration (WAPA) property. Please see comments below.
10. Tables, the NDEP has the following comments:
  - a. Table 2, the NDEP has the following comments

- i. TRX should submit errata pages for Table 2 that addresses the following comments for Table 2 and the comments for Appendix A as appropriate.
  - ii. The analysis indicated for PCBs on the column header is incorrect. This should include Aroclor and congener analysis.
  - iii. TRX should indicate in a footnote that platinum will be added to the analyses for boring SA132 and SA34.
  - iv. The following borings should include the corresponding analyses:
    1. SVOCs: SA141, SA142, SA171, SA140, SA36, SA174, SA132, SA112, and SA34
    2. Cyanide:
      - a. TRX should note that NDEP requested that “all borings located in Area 4 west of column 6 (not inclusive) and all borings associated with LOU 60 downstream of the LOU 63 conveyance piping junction” in the June 18, 2008 response letter to the Phase B Area IV SAP.
      - b. NDEP acknowledges that TRX will analyze all samples collected in Area I for total cyanide.
    3. PCBs: SA177, RSAR8, SA34 and RSAS8
    4. TPH DRO/ORO: SA157, SA178, SA141, SA142, SA171, SA140, SA36, SA174, and SA177
    5. TPH GRO: SA36
    6. 1,4-dioxane: SA177, RSAR8, SA34
  - b. Table 3, the NDEP has the following comments:
    - i. General comment, TRX should note that the NDEP does not necessarily agree that the selected wells are representative of the up-gradient, down-gradient and/or cross-gradient conditions as stated in the Appendix A LOU packets. The NDEP does note that the overall coverage of the groundwater sampling plan appears adequate.
    - ii. TRX should add analysis for 1,4-dioxane for all wells associated with this area.
    - iii. As noted previously, for wells with unknown lithology TRX should note that the use of this data will be limited. NDEP requests that TRX either determine the lithology (e.g.: through a down-hole camera) or re-drill the wells.
  - c. Table 4, LOU 20 Appendix A package and Table 4 are not consistent in regards to Goal of Closure.
  - d. Table 6, TRX should note that this table was not reviewed in detail by the NDEP as it is NDEP’s assumption that this table is consistent with the approved QAPP.
  - e. Table 7, TRX should note that this table was not reviewed in detail by the NDEP as it is NDEP’s assumption that this table is consistent with the approved QAPP.
11. Figure 4, NDEP noted that the wells used in this figure are not the same as those listed for the Phase B site-wide groundwater investigation. TRX should at a minimum use these wells in the creation of this figure.
12. Plate A, update this plate to include the following comments to the Appendix A LOU packets that affect boring placement.
13. Appendix A, the NDEP has the following comments:
  - a. LOU 20 (Pond C-1 and Associated Piping in Area III), the NDEP has the following comments (please see the corresponding attached figure as necessary):
    - i. RSAP7 should be moved north adjacent to LOU 59 just past where LOU 59 crosses LOU 60.

- ii. SA36 should be moved north adjacent to LOU 20 piping and over LOU 60.
- iii. Significant inconsistencies have been noted between Table A, the text of the area-specific CSM, and the main body of the report. For example, based upon the text, all judgmental samples should include TPH analysis. Table A does not show this, please note that this analysis should be added. Table A includes dioxin/furan analysis, however, this is not described in the text. No change to the table is necessary. SVOC analysis proposed on the Table is also not consistent with the text. SVOC analysis should be added to location SA36. These comments are compiled into the NDEP's comments listed above for Table 2, however, they are included herein as an example.
- iv. LOU 24 and 46 (Mn Tailings Area and Old Main Cooling Tower), the NDEP has the following comments (please see the corresponding attached figure as necessary):
  - v. TRX should clarify if the starting point (i.e. surface) for sample collection located over the Mn tailings pile is at the soil-tailings interface.
  - vi. SA139 should be moved to a point just north of the Mn tailings pile approximately halfway between wells M-35 and CLD4-R. Additionally, a groundwater monitoring well should be installed at this location.
  - vii. An additional boring should be located within the surface flow area indicated on Figure A of the LOU.
- b. LOU 34E, 47, 48, 49, 50, 51, and Area 70 (Operational Manganese Leach Plant and Former US Vanadium Site)
  - i. General comment, TRX should note that the tailings status as non-hazardous waste is not pertinent to Site characterization. This is a comment that applies to other statements within the subject document and will not be repeated for each instance.
  - ii. TRX notes that the ore is ½" to 1" in diameter. It is likely that there is a percentage of "fines" within the ore and this should be acknowledged.
  - iii. RSAO8 should be converted to an additional groundwater monitoring well.
  - iv. An additional boring should be located in the northern portion of LOU 47 (Historical) over LOU 60.
- c. LOU 44 and 37 (Unit 6 Basement and Former Satellite Accumulation Point, Unit 6 Maintenance Shop)
  - i. TRX should note that characterization under the Unit buildings is not precluded due to continued operations. Angled or directional borings may be used to characterize under the active portions of the buildings.
  - ii. TRX should provide additional information of the cathode wash and storage areas adjacent to LOU 44.
  - iii. TRX should add the following analyses to the borings associated with this LOU: PCBs and 1,4-dioxane.
  - iv. M-122, M-145, and M-139: samples should be collected during boring advancement.
- d. LOU 59 (Storm Drain System Segment), the NDEP has the following comments (please see the corresponding attached figure as necessary):
  - i. General comment, the borings associated with this LOU should be located immediately adjacent to the storm drain system whenever possible.
  - ii. The table in this Section of the Appendix does not address any of the off-Site sources that were disposed of in the Beta Ditch. This is a global comment which applies to all of the applicable area-specific CSMs that are in Appendix A. NDEP considered this

- issue during the review of the document and requested additional sampling, as appropriate.
- iii. TRX should add the following analyses to the borings associated with this LOU because of the potential Stauffer discharges into this LOU: organophosphate pesticides (OPP) and organic acids. TRX should note that this should apply to all samples within this LOU (including in other Areas, if possible).
  - iv. TRX should add PCB analysis to any boring located near the WAPA property.
  - v. An additional boring should be located on the slim portion of the Site near the junction with the southernmost leg of LOU 59 from TIMIET.
  - vi. An additional boring should be located adjacent to LOU 47 to the east near the junction with the LOU leg within the operation Mn leach plant.
  - vii. An additional boring should be located adjacent to LOU 59 just north of ChemStar property and south of LOU 34W.
- e. LOU 60 (Former Acid Drain System), the NDEP has the following comments (please see the corresponding attached figure as necessary):
- i. General comment, the borings associated with this LOU should be located directly above the former Acid Drain system whenever possible.
  - ii. General comment, for borings located above LOU 60, TRX should log the condition of the pipe, if possible, and collect a sample directly underneath the pipe. This sample may be substituted for the next proposed 10 foot interval in the Phase B SAPs, Table 2 (e.g. if the bottom of the Former Acid Drain System pipe was located at 8 fbg, then the sample should be collected directly underneath the pipe and not at 10 fbg). Please note that this comment additionally applies to the Phase B Area I and IV SAPs.
  - iii. TRX should add the following analyses to the borings associated with this LOU because of the potential Stauffer discharges into this LOU: OPP and organic acids. TRX should note that this should apply to all samples, all areas (if possible) for this LOU.
  - iv. SA141 should be moved west to the area where two legs of LOU 60 run parallel north of the East Diversion Ditch (west of the Mn tailings pile).
  - v. SA34 should be moved north adjacent to LOU 59 and over LOU 60.

• move BSA P7 adjacent to LOU 59 and near intersection with LOU 60.  
 • move SA36 north to be over LOU 60.



**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)

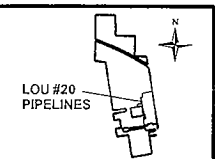
Base Aerial Photo from PBS&J, October 2006

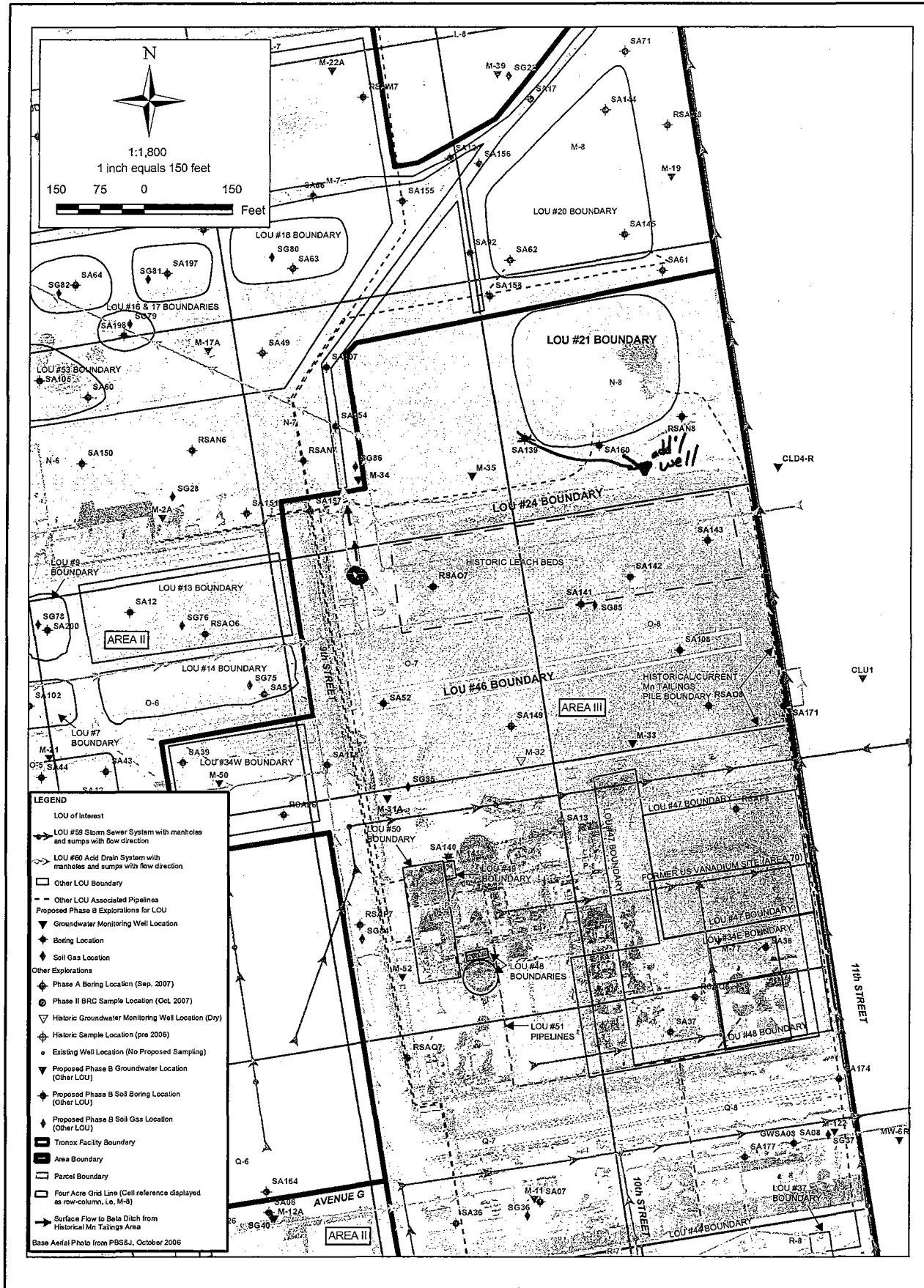
SHEET NUMBER:	1
FIGURE NUMBER:	

SAMPLE LOCATIONS FOR LOU #20, POND C-1 AND ASSOCIATED PIPING IN AREA III		
Phase B Area III Source Area Investigation		
Tronox Facility		
Henderson, Nevada		
SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	6/4/2008	04020-023-430

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





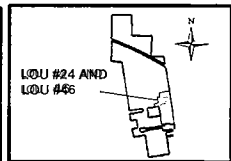
additional boring located in surface flow from MN TAILINGS Area  
 near SA139 to just north of LOU 24 & convert to monitoring well.

SHEET NUMBER:	1
FIGURE NUMBER:	

SAMPLE LOCATIONS FOR LOU #24 AND #46 MN TAILINGS AREA AND OLD MAIN COOLING TOWER Phase B Area III Source Area Investigation Tronox Facility Henderson, Nevada		
SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	6/9/2008	04020-023-480

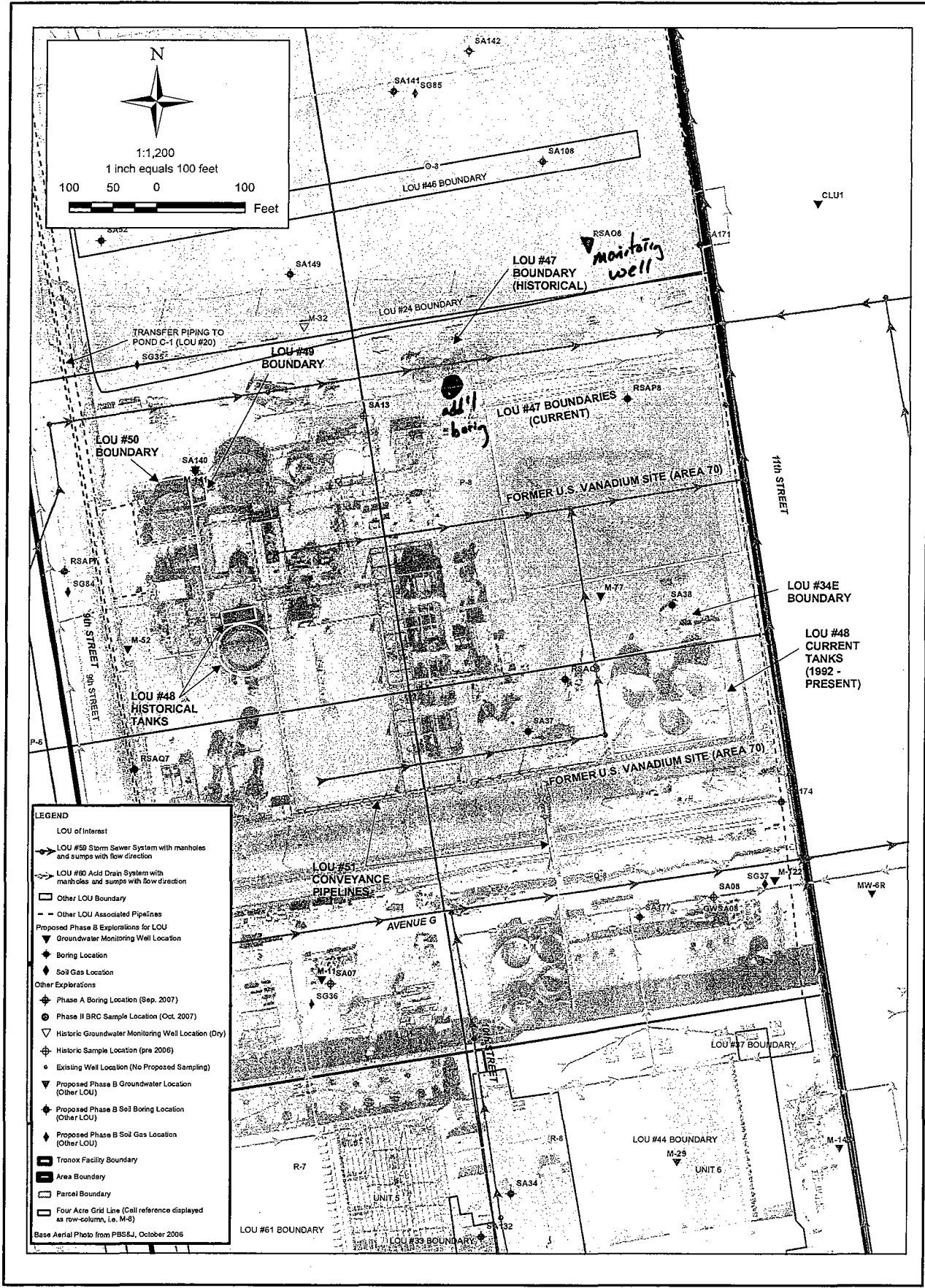
ENBR CORPORATION  
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CHECKED BY:	C. Schmall
APPROVED BY:	B. Ho





Additional boring on LOU 60 in northern portion of historical cavity.  
 Convert RSA08 to monitoring well.



**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 PBSSJ, October 2006

SHEET NUMBER	1
FIGURE NUMBER	1

**SAMPLE LOCATIONS FOR LOUs #34E, #47, #48, #49, #50, #51 AND AREA 70 (FORMER U.S. VANADIUM SITE)**

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

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	6/9/2008	04020-023-430

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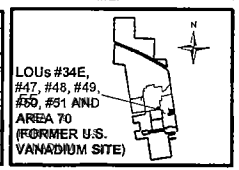
ENSR CORPORATION  
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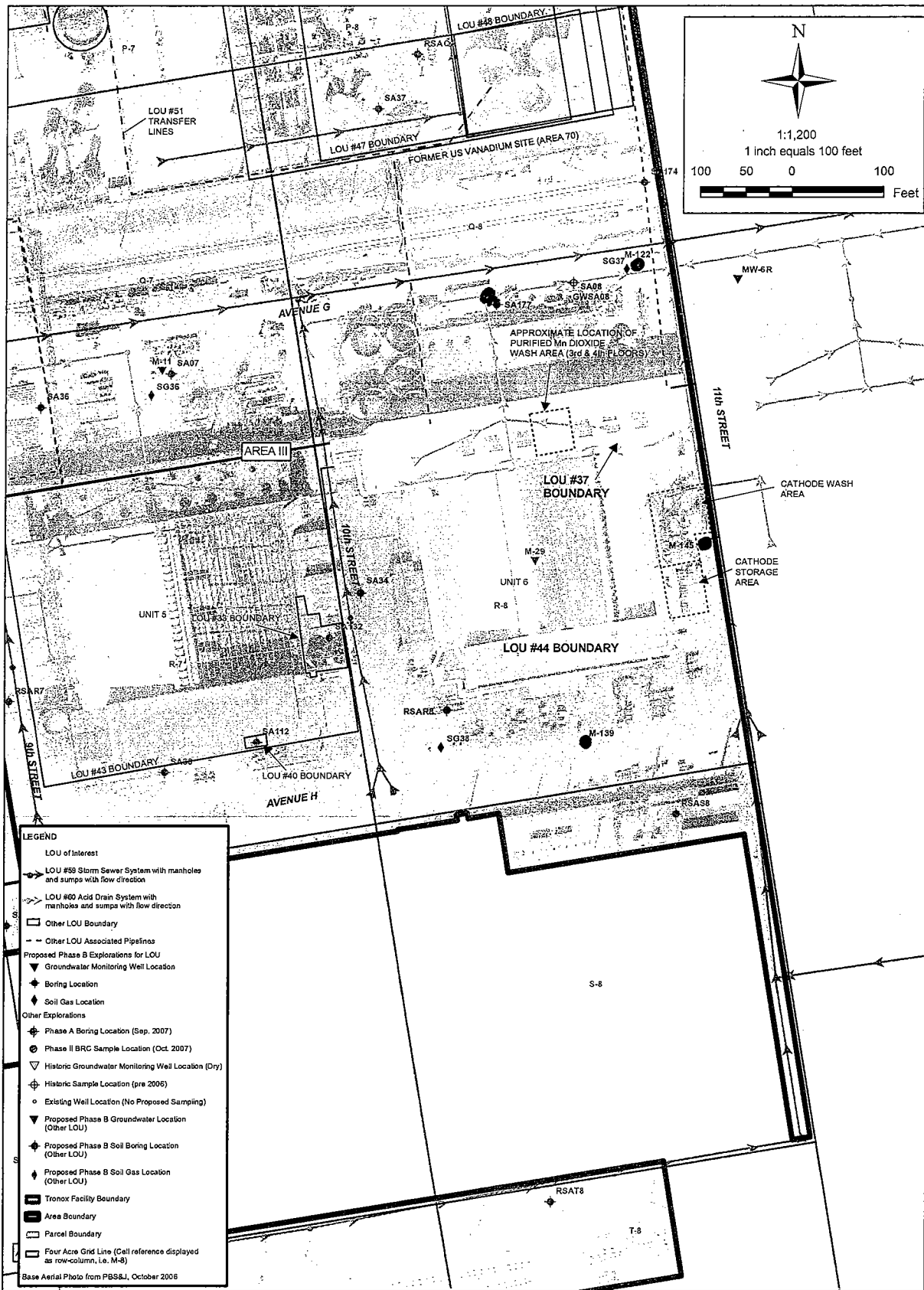
DRAWN BY:  
M. Scop

CHECKED BY:  
C. Schnell

APPROVED BY:  
B. Ho



SA177 move to intersection/junction LOU 60.  
 Add borings (collect samples) for M-122, M-145 & M-139

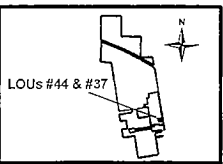


SHEET NUMBER:	X
FIGURE NUMBER:	1

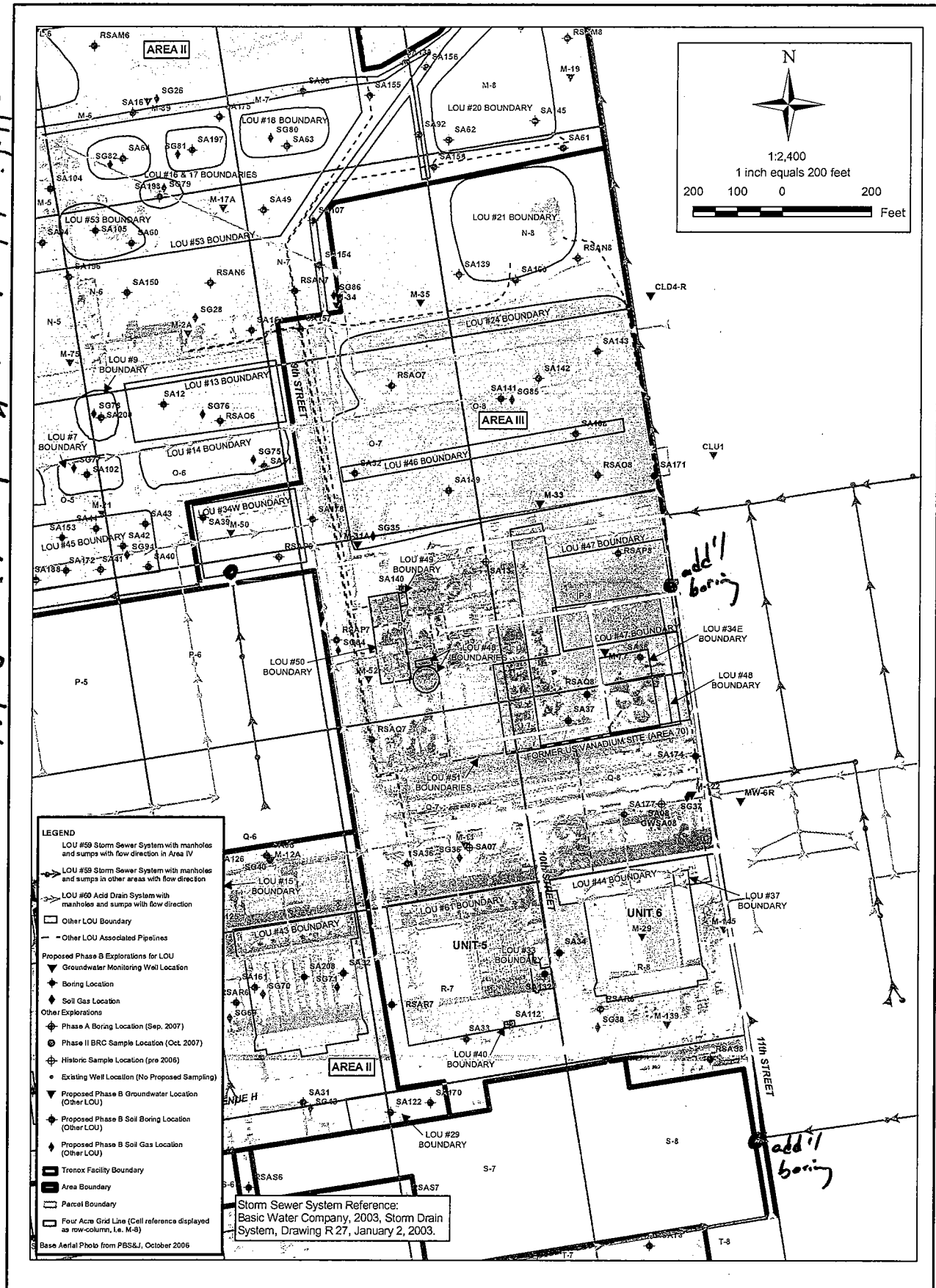
SAMPLE LOCATIONS FOR LOUs #44 & #37 UNIT 6 BASEMENT & FORMER SATELLITE ACCUMULATION POINT - UNIT 6 MAINTENANCE SHOP Phase B Area III Source Area Investigation Tronox Facility, Henderson, Nevada		
SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	6/4/2008	04020-023-430

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APPROVED BY:	B. Ho



additional boring southeast portion of LOU  
 additional boring at junction on east side of LOU #7.



SHEET NUMBER:	1
FIGURE NUMBER:	X

SAMPLE LOCATIONS FOR LOU #59 IN AREA III STORM DRAIN SYSTEM SEGMENT		
Phase B Area III Source Area Investigation Tronox Facility Henderson, Nevada		
SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	6/3/2008	04020-023-430

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