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NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
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STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

Jim Gibbons, Governor
Allen Biaggi, Director
Leo M. Drozdoff, P.E., Administrator

March 20, 2009

Susan Crowley (Contractor)
C/O Tronox LLC
PO Box 55
Henderson, NV 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection (NDEP) Response to:
Semi-Annual Remedial Performance Report for Chromium and Perchlorate Tronox LLC, Henderson, Nevada, July 2008 – December 2008
Dated February 27, 2009

Dear Ms. Crowley,

The NDEP has received and reviewed TRX's above-identified Performance Report and provides comments in Attachment A. TRX should provide an annotated response-to-comments (RTC) letter as part of the next Performance Report submittal. Please note that TRX should provide a submittal date for the Data Review Memorandum for this Performance Report **by April 3, 2009**.

Please contact the undersigned with any questions at 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
Fax: 702-486-5733

SH:bar:sh

CC: Jim Najima, NDEP, BCA, Carson City
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Paul Sundberg, Montrose Chemical Corporation, 10733 Wave Crest Court, Stockton, CA 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110

Attachment A

1. CD, please note that the CD provided with the Report was blank.
2. Section 2.1, page 2-1, 1st paragraph, TRX states that "Historic water elevations across the barrier wall directly downgradient of the well field show that north of the barrier wall water levels in wells M-69 through M-74 range between two to seven feet lower than water elevations south of the barrier wall. This indicates negligible hydraulic communication across the barrier wall (see Figure 3)." NDEP has the following comments that TRX should include in this discussion/section and provide an explanation as to how the following comments impact the conclusion that the hydraulic communication across the barrier wall is negligible:
   a. Figure 3 shows that historically the groundwater elevation in downgradient well M-69 has been greater than three to five feet below the groundwater elevation for upgradient well I-Y. However, the groundwater elevation difference between these two wells has been less than one to two feet since April 2008. Please note that similar conditions are observed between M-71 and M-56.
   b. Figure 3 shows that the groundwater has increased in the downgradient well M-70 so that the groundwater elevation downgradient of the barrier wall has been greater than the groundwater elevation upgradient of the barrier wall since March 2008
3. Section 3.1.1, NDEP has the following comments:
   a. TRX states that "[the total chromium concentration in] I-Q has dropped in half since February 2008." However, the total chromium concentration in I-Q in May 2008 was similar to the November 2008 low and August 2008 was similar to the February 2008 high. This is a reason why NDEP finds little value in discussing contaminant concentration differences between quarters. In future submittals, TRX should focus this type of discussion on trends in the data.
   b. 3rd paragraph, TRX states that "chromium concentrations downgradient of the barrier wall and recharge trenches continue to decline". Please provide data to substantiate this statement in future submittals. (Please note that NDEP will not comment on each occurrence in this Performance Report; however, this comment should be incorporated throughout future submittals.)
4. Figure 3, please revise this figure as follows:
   a. For ease of comparison, please revise the date and elevation axes so that they are identical for each graph.
   b. The dates for the installation of the barrier wall, the cessation of Lake Mead water injection, and the commencement of injection of Lake Mead water after trench refurbishment should be noted either on the graphs or as a footnote to this figure.
5. Figure 6, please clarify what the purpose of this graph is and what is meant by the "downgradient" notation on PC-91 (i.e. downgradient of what?).
6. Appendix C, RTC 6.c.i and RTC 7, if TRX feels that data collected and validated by companies other than TRX is inappropriate for inclusion in the Appendix A table, then please provide this data as requested in NDEP's original comments in a separate table specified for this purpose in future Performance Report submittals.
7. Appendix D, please provide a schedule for the submittal of the Data Review Memorandum for this Report **by April 3, 2009.**

Tronox Response to March 20, 2009 NDEP Comments on the Semi-Annual Remedial Performance Report dated February 27, 2009

NDEP Comment

1. CD, please note that the CD provided with the Report was blank.

Tronox Response

TRX will test all CDs prior to distribution of all future submittals.

NDEP Comment

2. Section 2.1, page 2-1, 1st paragraph, TRX states that "Historic water elevations across the barrier wall directly downgradient of the well field show that north of the barrier wall water levels in wells M-69 through M-74 range between two to seven feet lower than water elevations south of the barrier wall. This indicates negligible hydraulic communication across the barrier wall (see Figure 3)." NDEP has the following comments that TRX should include in this discussion/section and provide an explanation as to how the following comments impact the conclusion that the hydraulic communication across the barrier wall is negligible:
   a. Figure 3 shows that historically the groundwater elevation in downgradient well M-69 has been greater than three to five feet below the groundwater elevation for upgradient well I-Y. However, the groundwater elevation difference between these two wells has been less than one to two feet since April 2008. Please note that similar conditions are observed between M-71 and M-56.
   b. Figure 3 shows that the groundwater has increased in the downgradient well M-70 so that the groundwater elevation downgradient of the barrier wall has been greater than the groundwater elevation upgradient of the barrier wall since March 2008

Tronox Response

2.a. and b. TRX will include an explanation of how the NDEP comments impact the conclusion that the hydraulic communication across the barrier wall is negligible in the next Annual Remedial Performance Report.

NDEP Comment

3. Section 3.1.1, NDEP has the following comments:
   a. TRX states that "[the total chromium concentration in] I-Q has dropped in half since February 2008." However, the total chromium concentration in I-Q in May 2008 was similar to the November 2008 low and August 2008 was similar to the February 2008 high. This is a reason why NDEP finds little value in discussing contaminant concentration differences between quarters. In future submittals, TRX should focus this type of discussion on trends in the data.
   b. 3rd paragraph, TRX states that "chromium concentrations downgradient of the barrier wall and recharge trenches continue to decline". Please provide data to substantiate this statement in future submittals. (Please note that NDEP will not comment on each occurrence in this Performance Report; however, this comment should be incorporated throughout future submittals.)

Tronox Response

3.a. TRX will focus discussion of contaminant concentrations on trends in the data in future submittals.
3.b. TRX will provide data to substantiate all claims in future submittals.

NDEP Comment

4. Figure 3, please revise this figure as follows:
   a. For ease of comparison, please revise the date and elevation axes so that they are identical for each graph.
   b. The dates for the installation of the barrier wall, the cessation of Lake Mead water injection, and the commencement of injection of Lake Mead water after trench refurbishment should be noted either on the graphs or as a footnote to this figure.

Tronox Response
4.a. and b. TRX will revise the figure as requested.

NDEP Comment

5. Figure 6, please clarify what the purpose of this graph is and what is meant by the "downgradient" notation on PC-91 (i.e. downgradient of what?).

Tronox Response
Figure 6 was included as part of the discussion of the effect on the potentiometric surface of the very large groundwater mounding event at the COH RIBs in November 2008. The figure was meant to show that the leading edge of the groundwater mound was evident in PC-58 in November but had not yet reached PC-91. The "downgradient" notation was to identify PC-91 as downgradient of PC-58. The value of this figure in future submittals will be re-examined.

NDEP Comment

6. Appendix C, RTC 6.c.i and RTC 7, if TRX feels that data collected and validated by companies other than TRX is inappropriate for inclusion in the Appendix A table, then please provide this data as requested in NDEP's original comments in a separate table specified for this purpose in future Performance Report submittals.

Tronox Response
TRX will provide the data collected and validated by other companies in a separate table in future Performance Report submittals.

NDEP Comment

7. Appendix D, please provide a schedule for the submittal of the Data Review Memorandum for this Report **by April 3, 2009.**

Tronox Response
The schedule for the submittal of the Data Review Memorandum has been provided.

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STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

Jim Gibbons, Governor
Allen Biaggi, Director
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November 10, 2009

Susan Crowley (Contractor)
C/O Tronox LLC
PO Box 55
Henderson, NV 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection (NDEP) Response to:
Annual Remedial Performance Report for Chromium and Perchlorate, Tronox LLC, Henderson, Nevada, July 2008 – June 2009
Dated August 21, 2009

Dear Ms. Crowley,

The NDEP has received and reviewed TRX's above-identified Report and provides comments in Attachment A. TRX should provide an annotated response-to-comments (RTC) letter as part of the next Semi-Annual Report submittal.

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

Sincerely,

Shannon Harbour, P.E.
Staff Engineer III
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Special Projects Branch
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Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110
Jeff Gibson, AMPAC, 3883 Howard Hughes Pkwy, Ste 700, Henderson, NV 89169

Attachment A

1. Section 2.1, page 3, 2nd paragraph, last sentence, the value given in this sentence for the Lake Mead water flow rate "currently" injected into the trenches does not correspond with the "current" value on Figure 2. Please clarify.
2. Section 4.1.1, page 12, 3rd paragraph, TRX states that a "groundwater pulse containing a high concentration of perchlorate, with few other salts present, is responsible for this anomaly [elevated perchlorate concentration without a corresponding elevated TDS concentration]." Please discuss where the "groundwater pulse" would have originated that is responsible for this "anomaly" that has been occurring since at least 2005.
3. Section 4.1.2, pages 13-14, the perchlorate concentrations discussed in this Section do not coincide with the perchlorate concentrations listed on Plate 7. Please provide better quality control of future documents.
4. Section 4.1.3, page 16, 2nd paragraph, TRX states that "The relative higher perchlorate-impacted groundwater in PC-91 appears to be limited in lateral and vertical extent, based on the lower concentrations in other nearby wells." PC-91 is screened approximately 1520 – 1530 ft MSL (starting about 15 ft below the water table). "Nearby well" PC-133 is screened across the water table with approximately 30 ft of wetted screen (approximately 1510 – 1540 ft MSL). The proposed groundwater well is also shown as having approximately 30 ft of wetted screen (approximately 1510 – 1540 ft MSL) and screened across the water table. Please discuss whether it is appropriate to compare the results of PC-91 to other dissimilarly screened wells. TRX should consider revising the Site-wide Sampling and Analysis Plan to better monitor the vertical components of the plumes.
5. Section 4.2, page 18, please clarify whether Pond AP-5 is still being remediated by slow feed into the FBR or if the insoluble solids drying and awaiting disposal.
6. Figures, NDEP has the following comments:
   a. The colors and markers should be consistent for the corresponding data sets for each of the following sets of Figures.
      i. Figures 9 and 11
      ii. Figures 14 and 14A
      iii. Figures 15 and 17
   b. Figure 2, please indicate when the north trench came back on-line.
7. Plate 6, Groundwater Total Chromium Map, the iso-contours in Inset B on the northwest side of the slurry wall seem to be incorrect. The 1 ppm iso-contour just east of M-69 and the 0.1 ppm iso-contour just east of M-70 seem to be switched. Please review and revise as necessary for future submittals.
8. Appendix A, NDEP has the following comments:
   a. Please note that the electronic version of the database was not included on the CD submitted with this document.
   b. NDEP noted several instances of anomalous data (e.g. M-97 is listed as being sampled on both 5/4/09 and 5/6/09 with identical results, M-100 is noted as "dry" but a perchlorate concentration is listed, etc.). NDEP did not provide an exhaustive review of this Table. Please provide better quality control of the data in future documents.

9. Appendix C, NDEP has the following comments:
    a. Response-to-Comment (RTC) 2.a and 2.b, TRX should provide the response to each of NDEP's comments in the RTC or provide a reference to the location of the response within the document.
    b. RTC 4, if NDEP comments on a Figure, Table, or Section of a document and TRX changes the Figure, Table or Section number in the Revised or new report, the new number should be referenced in the corresponding RTC. (e.g. Figure 3 in the Semi-Annual Report in NDEP Comment 4 became Figure 2 in the Annual Report, in which NDEP Comment 4 was addressed. The RTC should have noted the change in number.)
10. Appendix D, NDEP responded under separate cover. Please see NDEP correspondence Re: Data Validation Summary Report dated October 20, 2009.

Tronox Response to NDEP November 10, 2009 Comments on the Annual Remedial Performance Report for Chromium and Perchlorate, Tronox LLC, Henderson, Nevada, July 2008 – June 2009, dated August 21, 2009

1. NDEP Comment
Section 2.1, page 3, 2nd paragraph, last sentence, the value given in this sentence for the Lake Mead water flow rate "currently" injected into the trenches does not correspond with the "current" value on Figure 2. Please clarify.

Tronox Response
The value given in text is from July 26, 2009 and is incorrect. The correct value is 43.5 gpm.

2. NDEP Comment
Section 4.1.1, page 12, 3rd paragraph, TRX states that a "groundwater pulse containing a high concentration of perchlorate, with few other salts present, is responsible for this anomaly [elevated perchlorate concentration without a corresponding elevated TDS concentration]." Please discuss where the "groundwater pulse" would have originated that is responsible for this "anomaly" that has been occurring since at least 2005.

Tronox Response
The groundwater pulse containing the high concentration of perchlorate originated in the area of I-AR where a perchlorate slurry pump was once located. The seals on this pump leaked.

3. NDEP Comment
Section 4.1.2, pages 13-14, the perchlorate concentrations discussed in this Section do not coincide with the perchlorate concentrations listed on Plate 7. Please provide better quality control of future documents.

Tronox Response
The perchlorate concentrations shown on Plate 7 are from May 2009. The concentrations in the text are from June 2009. Dates will be added in future document text to distinguish sample dates.

4. NDEP Comment
Section 4.1.3, page 16, 2nd paragraph, TRX states that "The relative higher perchlorate-impacted groundwater in PC-91 appears to be limited in lateral and vertical extent, based on the lower concentrations in other nearby wells." PC-91 is screened approximately 1520 – 1530 ft MSL (starting about 15 ft

below the water table). "Nearby well" PC-133 is screened across the water table with approximately 30 ft of wetted screen (approximately 1510 – 1540 ft MSL). The proposed groundwater well is also shown as having approximately 30 ft of wetted screen (approximately 1510 – 1540 ft MSL) and screened across the water table. Please discuss whether it is appropriate to compare the results of PC-91 to other dissimilarly screened wells. TRX should consider revising the Site-wide Sampling and Analysis Plan to better monitor the vertical components of the plumes.

Tronox Response
PC-91 is one half of a well pair with adjacent well PC-92. The saturated alluvial interval at PC-91/92 is about 28.5 ft and together the two wells contain 20 ft of saturated screen (10 ft each). Nearby well PC-133, a recovery well, has about 26.5 ft of saturated screen. While it is not proper to compare the results of dissimilarly screened wells, Tronox believes that the 20 ft of wet screen in PC-91/92 vs. the 26 ft of wet screen in PC-133 are close enough to render the comparison of results between these wells as valid.

5. NDEP Comment
Section 4.2, page 18, please clarify whether Pond AP-5 is still being remediated by slow feed into the FBR or if the insoluble solids drying and awaiting disposal.

Tronox Response
Tronox is still circulating water into Pond AP-5 to dissolve residual perchlorate. This water is pumped into Pond GW-11 and from there it goes to feed the FBR.

6. NDEP Comment
Figures, NDEP has the following comments:

a. The colors and markers should be consistent for the corresponding data sets for each of the following sets of Figures.
    i. Figures 9 and 11
    ii. Figures 14 and 14A
    iii. Figures 15 and 17
b. Figure 2, please indicate when the north trench came back on-line.

Tronox Response
a. /b. In future documents these figures will have consistent colors and markers. The north trench came back on-line in July 2009.

7. NDEP Comment
Plate 6, Groundwater Total Chromium Map, the iso-contours in Inset B on the northwest side of the slurry wall seem to be incorrect. The 1 ppm iso-contour just east of M-69 and the 0.1 ppm iso-contour just east of M-70 seem to be switched. Please review and revise as necessary for future submittals.

Tronox Response
The contours in question were mislabeled.

8. NDEP Comment
Appendix A, NDEP has the following comments:

a. Please note that the electronic version of the database was not included on the CD submitted with this document.
b. NDEP noted several instances of anomalous data (e.g. M-97 is listed as being sampled on both 5/4/09 and 5/6/09 with identical results, M-100 is noted as "dry" but a perchlorate concentration is listed, etc.). NDEP did not provide an exhaustive review of this Table. Please provide better quality control of the data in future documents.

Tronox Response
a. /b. Tronox notes that the electronic version of the database was not included on the CD submitted with this document. Tronox will provide better quality control of the data in future documents.

9. NDEP Comment
Appendix C, NDEP has the following comments:

a. Response-to-Comment (RTC) 2.a and 2.b, TRX should provide the response to each of NDEP's comments in the RTC or provide a reference to the location of the response within the document.
b. RTC 4, if NDEP comments on a Figure, Table, or Section of a document and TRX changes the Figure, Table or Section number in the Revised or new report, the new number should be referenced in the corresponding RTC. (e.g. Figure 3 in the Semi-Annual Report in NDEP Comment 4 became Figure 2 in the Annual Report, in which NDEP Comment 4 was addressed. The RTC should have noted the change in number.)

Tronox Response
a. /b. Tronox will provide the response to each of NDEP's comments in the RTC or provide a reference to the location of the response within the document. Tronox will reference in the RTC any changed figure, table or section number in a new or revised document.

10. NDEP Comment
Appendix D, NDEP responded under separate cover. Please see NDEP correspondence Re: Data Validation Summary Report dated October 20, 2009.

Tronox Response
Tronox responded under separate cover to this NDEP comment on November 23, 2009.

Tronox Response to NDEP October 20, 2009 Comments Regarding:

Tronox's *Data Validation Summary Report (Appendix D of the Annual Remedial Performance Report for Chromium and Perchlorate , Henderson, Nevada July 2008 – June 2009) Dated August 5, 2009*

NDEP Comment:

1. General comment, electronic versions of Tables I and III would greatly facilitate assessment of the report. Please include excel files of the tables in future reports.

Tronox Response:

Table I in Word ® and Table III in Excel ® are attached.

NDEP Comment:

2. General comment, there are a number of discrepancies between the numbers provided in the Analytical Review text and the database. Investigate the differences and revise the appropriate section of the report or the database. These discrepancies are outlined below:

a. Section 2.0, 632 water samples analyzed for chromium and 631 in the database

b. Section 3.0, 978 water samples analyzed for TDS and 976 in the database

c. Section 3.0, 978 water samples analyzed for perchlorate and 974 in the database

d. Section 3.0, 6 water samples analyzed for nitrate/nitrite as nitrogen and 9 in the database

e. Section 3.0, 53 water samples analyzed for hexavalent chromium and 52 in the database

f. Section 3.0, 26 water samples analyzed for chlorate and 28 in the database

g. Section 3.0, 20 water samples analyzed for nitrate as nitrogen and 22 in the database by method SW -846 9056. There were also 15 more results analyzed by method EPA 300.

h. Section 3.0, Wet chemistry total records is 2079 compared to the database with 2076 records

i. Section 3.2.1, 119 results qualified for holding time but only 117 in the database

j. Section 5.4, the total number of records of 2711 is 2707 in the database

Tronox Response:

2.a Confirmed 631 water samples in database, DVSR text revised

2.b Confirmed 976 water samples in database, DVSR text revised

2.c Confirmed 974 water samples in database, DVSR text revised

2.d Confirmed 9 water samples in database, DVSR text revised

2.e Confirmed 52 water samples in database, DVSR text revised

2.f Confirmed 28 water samples in database, DVSR text revised

2.g Confirmed 22 and 15 water samples in database respectively, DVSR text revised

2.h Confirmed 2076 records for wet chemistry in database, DVSR text revised

2.i The actual number of holding time qualifications is 121. Two samples rejected, 1 sample qualified "be,h", 118 samples qualified "h". The database originally submitted was missing sample M-10_11/05/08 for hexavalent chromium qualified "h". Hexavalent chromium for M-10_11/05/08 was added to the database.

2.j Confirmed 2707 total records in database, DVSR text revised

NDEP Comment:

3. General comment, Database, the database that was provided does not include the QC results. These are required for the data validation review but are not required for the EDD (Please see below). Provide the QC results either in a separate validation report database or as a separate table in the Access database as a part of the EDD.

Tronox Response:

Please see the database file included with this RTC named "TRONOX NDEP Ques3 QCDatabase LDC 11-20-09.mdb".

NDEP Comment:

4. General comment, EDD, the database provided does not meet the Electronic Data Deliverables requirements specified in the Unified EDD Format available at http://ndep.nv.gov/bmi/technical.htm. The following discrepancies are noted:

a. The following fields are missing from the Access database: hydro, litho, filtered_flag

b. The result_type is TRG, which is not an acceptable entry. "Target" is TG if this is what was intended.

c. Reanalysis_flag contains "QUAD" followed by a space and a number or just a number. Review the Detailed Description in the EDD guidance for appropriate values.

d. Detect_flag should be a "T" or "F", not a "Y" or "N"

e. Validation_flag should be a "T" or "F", not a "Y" or "N"

f. Final_validation_qualifiers should be "final_validation_qualifier" (without the "s")

g. Validation_reason should be "final_validation_reason"

h. the sdg_id field was blank; provide the sample delivery group identification for all samples.

Tronox Response:

4.a The fields have been added to the database.

4.b Corrected the result_type to TG.

4.c Changed QUAD to Initial1, Initial2, Initial3, Initial4 to indicate that all the analyses were initial analyses performed four times.

4.d Corrected detect_flag to T or F.

4.e Corrected validation_flag to T or F.

4.f Removed s from final_validation_qualifiers.

4.g Not corrected. Please see Item 2.C.III of the attached 090702_edd_format_revised.pd.f

4.h The sdg_id field has been updated.

NDEP Comment:

5. Section 3.2.1, paragraph 2, the results estimated based on holding time are qualified J- and UJ (not J and UJ)

Tronox Response:

The DVSR text has been revised.

NDEP Comment

6. Sample PC-55_08/11/08 for TDS, the reason codes should be “l,ld” and not “ll,ld”

Tronox Response:

The database has been modified to reflect correct reason code “l,ld”