



Susan Crowley
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September 26, 2008

Mr. Brian Rakvica, P.E.
Nevada Division of Environmental Protection
2030 East Flamingo Road, Suite 230
Las Vegas, Nevada 89119-0818

Subject: BMI Plant Sites and Common Areas Projects, Henderson, Nevada
Response to August 4, 2008 NDEP Comments - Vertical Delineation of Contaminant Plumes and Hydraulic Gradients

Dear Mr. Rakvica:

On August 4, 2008, the Nevada Division of Environmental Protection (NDEP) provided comments on the Tronox LLC (Tronox) transmittal regarding vertical gradients beneath the Tronox facility in Henderson, Nevada. This correspondence transmits the Tronox response to those comments. Additionally, Tronox has provided a conceptual-level approach toward further investigation of the deeper hydrogeologic units below the Tronox site. Our proposed approach consists of a phased installation of deeper monitoring wells and is shown on the attached plate included with this transmittal. Upon your concurrence with the approach, Tronox will provide a work plan for implementation of this deeper investigation. If it would be helpful, a teleconference can be scheduled in which the approach can be fully discussed. Please let me know if this is desired.

If you have any comments or questions concerning this correspondence please contact me at (702) 651-2234. Thank you.

Sincerely

Susan M. Crowley
Staff Environmental Specialist

Overnight Mail
Attachment: As stated
cc: See attached Distribution List

Tronox. Adding value beyond the product.

Tronox Document Distribution List

Updated: 22-Sep-08

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Bailey	Keith	Environ Answers	X	X	
Krish	Ed	ENSR	X	X	
Bilodeau	Sally	ENSR	X	X	
Flack	Mike	ENSR	X	X	
Ho	Brian	ENSR	X	X	
Kennedy	Robert	ENSR	X	X	
Bradley	Lisa	ENSR	X	X	
Lambeth	Jeff	Veolia			
Guerriero	Joe	AIG		X	
Giroux	Barry	GEI		X	
Stowers	Kirk	Broadbent		X	
Sahu	Rahnijit	BMI		X	
Crouse	George	Syngenta		X	
Erickson	Lee	Stauffer		X	
Kelly	Joe	Montrose			
Sundberg	Paul	Montrose		X	
Gibson	Jeff	AmPac			
Richards	Curt	Olin		X	
Bellotti	Michael	Olin		X	
Wilkinson	Craig	Timet		X	
Mack	Joel	Montrose Counsel			

Prepared for:
Tronox LLC
Henderson, Nevada

Response to NDEP Comments Vertical Delineation of Contaminant Plumes and Hydraulic Gradients

ENSR Corporation
September 2008
Document No.: 04020-023-130

Prepared for:
Tronox LLC
Henderson, Nevada

Response to NDEP Comments Vertical Delineation of Contaminant Plumes and Hydraulic Gradients

ENSR Corporation
September 2008
Document No.: 04020-023-130



Tronox Response to Comments
August 4, 2008 NDEP Letter
Vertical Delineation of Contaminant Plumes and Hydraulic Gradients
Dated June 27, 2008

NDEP comment

1 General Comment, it is not clear that any of the gradient evaluations considered the density of the groundwater. This can be significant and must be considered. NDEP can provide guidance on performing these calculations if TRX has any questions.

Tronox Response

Consistent with the information NDEP provided to Tronox on September 4, 2008, vertical gradients were calculated following the methodology using fresh water heads. **Table 1** (attached), has been revised from the prior submittal to reflect these calculations. In general, the vertical gradient estimates did not change significantly.

NDEP Comment

2 General Comment, TRX has not discussed the validation status of the data presented. Please clarify this in the revised submittal.

Tronox Response

Table 1 (attached), has been modified to indicate the validation status of the data presented. Most of the data collected from the wells shown on **Table 1** prior to 2007 and 2008 was not validated. In general, the data since 2007 has been validated at the request of NDEP. While groundwater samples were analyzed for general minerals, the data prior to 2007 was collected with the purpose to establish trends in the perchlorate concentration in the shallow and deeper wells along the west side of the site.

NDEP comment

3 General comment, TRX has not discussed if a cation-anion balance has been conducted on the data sets and the results of the cation-anion balance needs discussion in the revised report.

Tronox Response

In response to this comment, Tronox performed a cation-anion balance using available data from the "TR" wells and samples collected between 1999 and 2008. The data used in the analysis are summarized in **Table 2** (attached). In general, the analysis shows that about 75% of the samples collected yearly since 1999 from these wells passed the acceptance criteria of not more than a five percent difference between the sum of major cations and anions. Where there was an upset to the balance beyond the criteria, in some cases the cause was missing data or anomalously high concentrations in one or more of the major ions. Of the 25% that did not pass, in some cases there were missing analytes such as sulfate and bicarbonate. While nitrate was not analyzed in some wells prior to 2005, its absence in these cases did not seem to affect the cation-anion balance negatively.

Additional evaluation of general minerals data was performed using cation and anion balance from groundwater samples collected during the Phase A investigation of the site. This data was provided as Table M-1 in the draft Phase A Report submitted to NDEP on September 27, 2007.

NDEP comment

4 General comment, in the revised report, please provide a schematic drawing which presents the various hydrogeologic units and the nomenclature that is being ascribed to these units by TRX.

Tronox Response

Tronox has prepared a cross section to illustrate the hydrogeologic units that have been interpreted below the site (see attached **Plate 1**). The cross section shows the distribution of these units with depth and their stratigraphy below the site. The nomenclature follows what Tronox provided to NDEP on June 27 regarding the proposed hydrostratigraphic nomenclature for the Black Mountain Industrial Complex. Tronox has interpreted four hydrostratigraphic units below the site from the drilling program completed to date. These four units shown on **Plate 1** are as follows:

- Qal Quaternary alluvium
- MCf1 Muddy Creek fine-grain facies No.1
- MCc1 Muddy Creek coarse-grain facies No.1
- MCc2 Muddy Creek coarse-grain facies No. 2

NDEP comment

5 General comment, Most of the well clusters do not address the five hydrogeologic formations described by TRX. TRX should review this matter and propose to install additional wells to address the vertical delineation issues at the Site.

Tronox Response

Four well nests are proposed to respond to this request from NDEP. The location of the well nests and their proposed completion depths are illustrated on **Plate 1**. The wells are proposed on the Tronox site, roughly down the spine of the complex beginning near the north side of the "unit" buildings and ending at the northern property boundary. The depths of the wells were selected based on the perchlorate data from the May 2008 sampling event and in consideration of the hydrostratigraphy illustrated on **Plate 1**.

The objective of these wells is to further delineate the vertical extent of perchlorate and to better understand the vertical hydraulic gradients below the site eastward from the line of wells on the western property boundary. It is our intent to initially drill and sample the shallow wells, then as necessary drill and install the deeper wells if perchlorate is detected in the shallow well water samples. Tronox will prepare a formal work plan for submittal to NDEP upon concurrence with these proposed locations.

These wells will additionally be sampled for general minerals to further evaluate the groundwater geochemistry below the site. It is anticipated that these data along with the results of the Phase A investigation and additional groundwater sampling proposed as part of the Phase B investigation will significantly improve the understanding in groundwater geochemistry within the four hydrostratigraphic units.

NDEP comment

6 Page 2, TRX notes that the construction information from wells MC-9 and H-58A are unclear. Please note that these wells should not be used in any way until the construction information is verified. Alternately, these wells can be replaced. Please advise the NDEP how the well clusters at location TR-11 and TR-12 will be addressed (i.e.: well construction will be determined or wells will be replaced).

Tronox Response

Table 1 summarizes the information gathered to date for these wells. Tronox is working to gather additional information on water chemistry for both wells and the well completion data for well MC-9. It is our intent to secure the necessary information from these wells so that they can be used as companion wells to TR-11 and TR-12, and thus, support an understanding of vertical gradients in these areas. The exploratory boring logs and available information on the well completion is provided in **Attachment A**.

NDEP comment

7 Figure 1, Please revise the Figure to indicate the hydrogeologic formation addressed by each well location. Please note that the format of the Figure submitted by Hargis on June 25, 2008 for the Companies associated with the Olin Site is very helpful.

Tronox Response

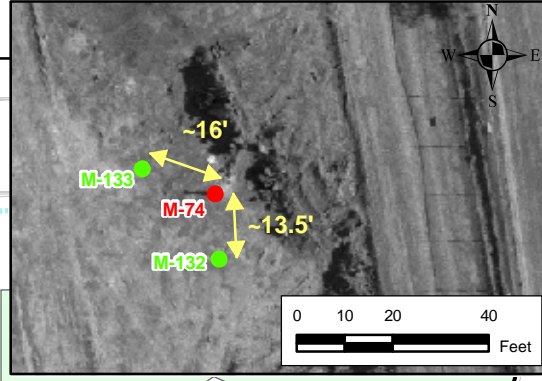
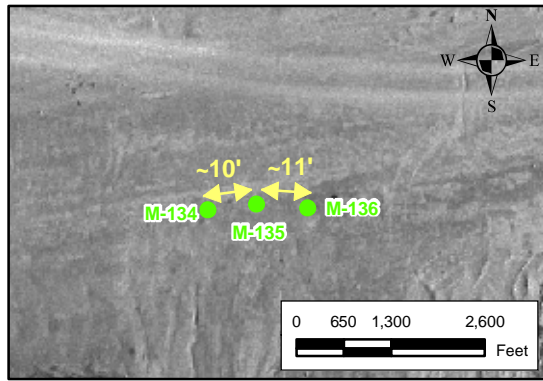
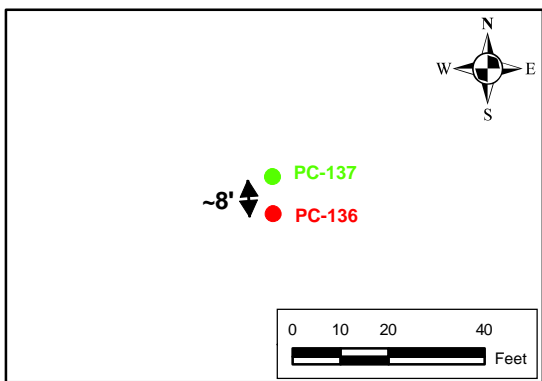
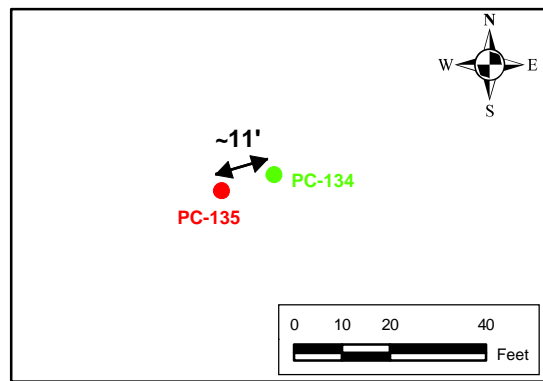
This figure has been revised as requested and is attached.

WELL NUMBER ⁽¹⁾	AQUIFER UNIT ⁽²⁾	WELL LOCATION	NORTHING ⁽³⁾	EASTING ⁽³⁾	WELL DIAMETER	TOP OF CASING	DEPTH TO TOP OF SCREEN	DEPTH TO BOTTOM OF SCREEN	TOTAL WELL DEPTH	ELEVATION TOP OF SCREEN	ELEVATION BOTTOM OF SCREEN	ELEVATION MID-POINT OF SCREEN	Sample Date ⁽⁴⁾	LABORATORY DATA		DATA VALIDATION STATUS	CATION/ANION BALANCE PERFORMED ⁽⁶⁾	GROUNDWATER				VERTICAL GRADIENT ⁽¹¹⁾																
														TDS	EC (Lab)			Measured DTW ⁽⁷⁾	Water Density ⁽⁸⁾	GW Elevation ⁽⁹⁾	Fresh Water Head ⁽¹⁰⁾	DATE		Water Level	Fresh Water Head													
														mg/L	umho/cm			ft-bgs	kg/m ³	ft-msl	ft-msl	shallow	deep	ft/ft	ft/ft													
TR-1	MCc2	Western Property Boundary	826168.04000	26719957.91000	4	1752.18	281.5	311.5	312.0	1470.68	1440.68	1455.7	9/2/99	--	903	NO	NO	--	--	--	--	2/18/05	2/18/05	-0.394	-0.391													
													9/3/99	--	1,840	NO	NO	--	--	--	--	2/4/06	2/4/06	-0.385	-0.382													
													9/7/99	--	1,392	NO	NO	--	--	--	--	1/18/07	1/18/07	-0.336	-0.333													
													9/23/99	--	1,283	NO	NO	--	--	--	--	5/14/08	5/14/08	-0.215	-0.213													
													10/7/99	--	1,283	NO	YES	+4.5	--	1,756.68	--	--	--	--														
													1/13/00	--	--	NO	NO	+10.9	--	1,763.08	--	--	--	--														
													2/2/01	--	1,040	NO	NO	+13.42	--	1,765.60	--	--	--	--														
													2/25/02	--	1,130	NO	YES	+18.71	--	1,770.89	--	--	--	--														
													2/19/03	--	--	NO	YES	+16.89	--	1,769.07	--	--	--	--														
													2/3/04	--	1,190	NO	YES	+20.91	--	1,773.09	--	--	--	--														
													2/18/05	--	1,120	NO	YES	+24.72	997.94	1,776.90	1,776.21	--	--	--														
													2/4/06	--	1,170	NO	YES	+24.49	997.94	1,776.67	1,775.98	--	--	--														
													3/20/06	--	--	NO	YES	--	--	--	--	--	--	--														
													1/18/07	678	1,190	NO	YES	+18.02	997.91	1,770.20	1,769.51	--	--	--														
													5/14/08	740	1,230	YES	YES	+1.85	997.96	1,754.03	1,753.39	--	--	--														
TR-2	MCf1 (deep)	Western Property Boundary	826156.85000	26719954.57000	4	1751.79	144.5	174.5	175.0	1607.29	1577.29	1592.3	9/9/99	--	3,950	NO	NO	--	--	--	--	--	--	--														
													9/23/99	--	4,080	NO	NO	--	--	--	--	--	--	--														
													10/7/99	--	4,080	NO	YES	28.00	--	1,723.79	--	--	--	--														
													1/13/00	--	--	NO	NO	31.20	--	1,720.59	--	--	--	--														
													2/4/01	--	932	NO	NO	39.03	--	1,712.76	--	--	--	--														
													2/25/02	--	941	NO	YES	30.11	--	1,721.68	--	--	--	--														
													2/19/03	--	--	NO	YES	29.50	--	1,722.29	--	--	--	--														
													2/3/04	--	1,000	NO	YES	29.38	--	1,722.41	--	--	--	--														
													2/18/05	--	933	NO	YES	28.66	997.83	1,723.13	1,722.81	--	--	--														
													2/4/06	--	960	NO	YES	27.70	997.83	1,724.09	1,723.77	--	--	--														
													3/22/06	--	--	NO	YES	--	--	--	--	--	--	--														
													1/18/07	560	990	NO	YES	27.49	997.83	1,724.30	1,723.98	--	--	--														
													5/14/08	566	965	YES	YES	27.13	997.83	1,724.66	1,724.34	--	--	--														
													TR-3	MCc2	Western Property Boundary	826342.89000	26718941.61000	4	1772.84	219.5	249.5	250.0	1553.34	1523.34	1538.3	10/7/99	--	1,330	NO	YES	5.40	--	1,767.44	--	--	--	--	
																										1/13/00	--	--	NO	NO	6.20	--	1,766.64	--	--	--	--	
2/4/01	--	1,060	NO	NO	3.58	--	1,769.26	--	--	--	--																											
2/25/02	--	1,080	NO	YES	1.79	--	1,771.05	--	--	--	--																											
2/19/03	--	--	NO	YES	+0.42	--	1,773.26	--	--	--	--																											
2/3/04	--	1,140	NO	YES	0.30	--	1,772.54	--	--	--	--																											
2/18/05	--	1,080	NO	YES	+2.50	997.90	1,775.34	1,774.81	--	--	--																											
2/4/06	--	999	NO	YES	+0.40	997.90	1,773.24	1,772.71	--	--	--																											
3/22/06	--	--	NO	YES	--	--	--	--	--	--	--																											
1/18/07	652	1,150	NO	YES	+2.75	997.89	1,775.59	1,775.06	TR-4	TR-3	-0.394	-0.390																										
5/15/08	656	1,130	YES	YES	+0.46	997.90	1,773.30	1,772.77	2/18/05	2/18/05	-0.369	-0.366																										
TR-4	MCf1 (deep)	Western Property Boundary	826342.53000	26718951.58000	4	1772.55	124.5	144.5	145.0	1648.05	1628.05	1638.1														9/15/99	--	3720	NO	NO	--	--	--	--	1/18/07	1/18/07	-0.396	-0.393
																										9/23/99	--	1,930	NO	NO	--	--	--	--	5/15/08	5/15/08	-0.375	-0.372
																										10/7/99	--	1,930	NO	YES	34.00	--	1,738.55	--	--	--	--	
																										1/13/00	--	--	NO	NO	38.75	--	1,733.80	--	--	--	--	
													2/4/01	--	1,080	NO	NO	37.73	--	1,734.82	--	--	--	--														
													2/25/02	--	1,440	NO	YES	38.17	--	1,734.38	--	--	--	--														
													2/19/03	--	--	NO	YES	37.92	--	1,734.63	--	--	--	--														
													2/3/04	--	1,760	NO	YES	38.40	--	1,734.15	--	--	--	--														
													2/18/05	--	1,520	NO	YES	36.45	998.07	1,736.10	1,735.89	--	--	--														
													2/4/06	--	1,430	NO	YES	36.15	998.07	1,736.40	1,736.19	--	--	--														
													3/20/06	--	--	NO	YES	--	--	--	--	--	--	--														
													1/18/07	894	1,560	NO	YES	36.42	998.08	1,736.13	1,735.92	--	--	--														
													5/15/08	868	1,470	YES	YES	36.68	998.06	1,735.87	1,735.66	--	--	--														

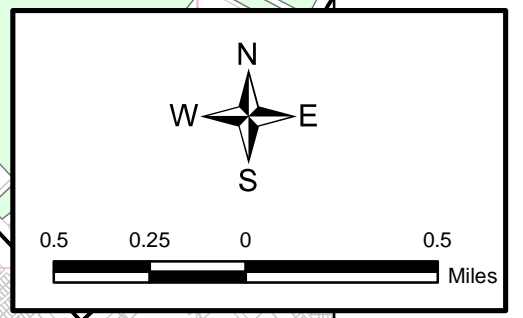
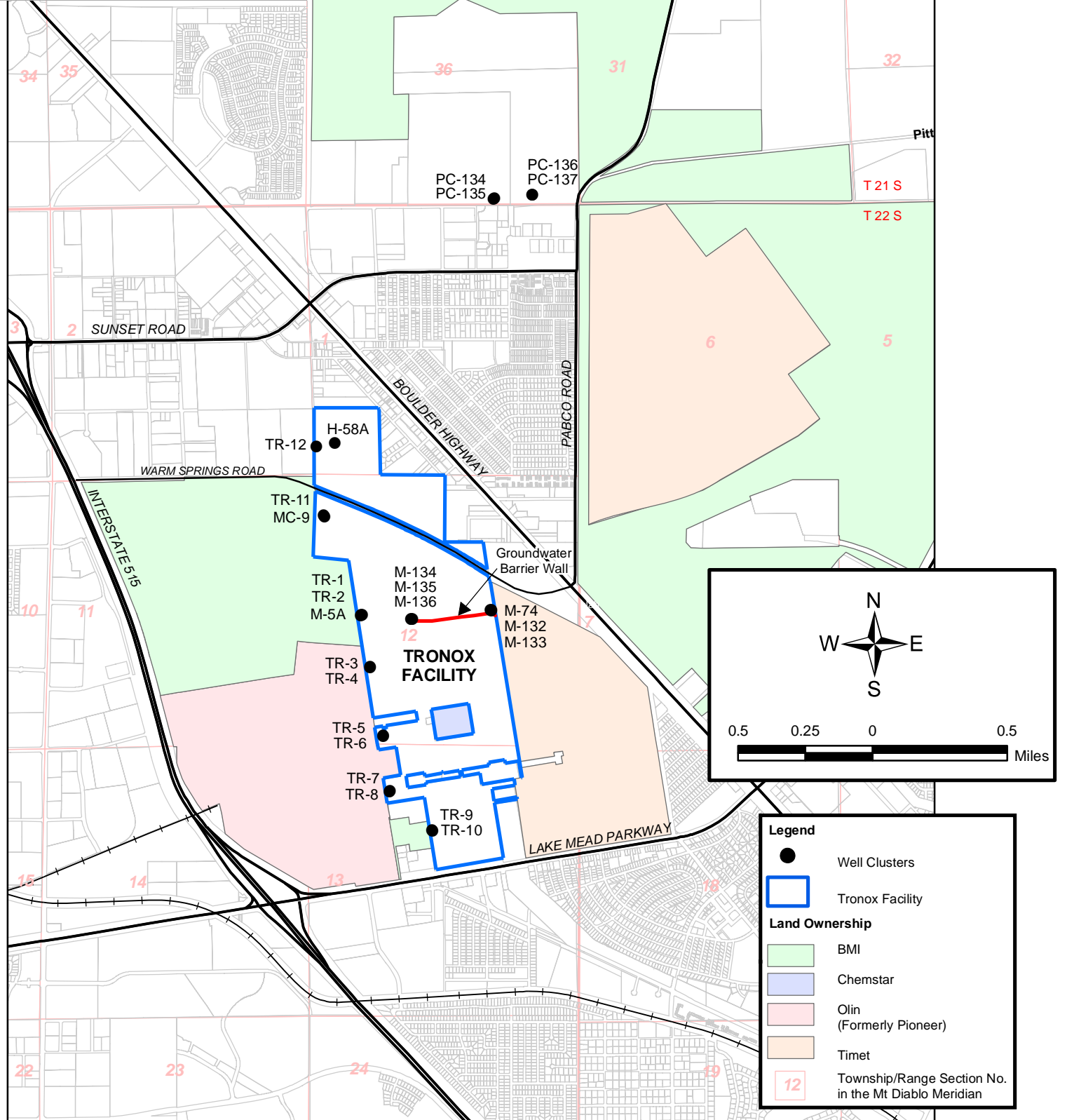
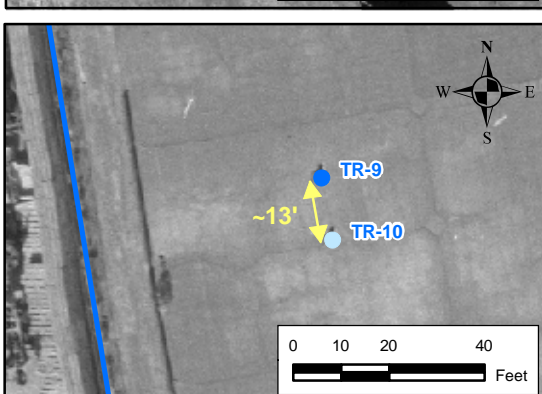
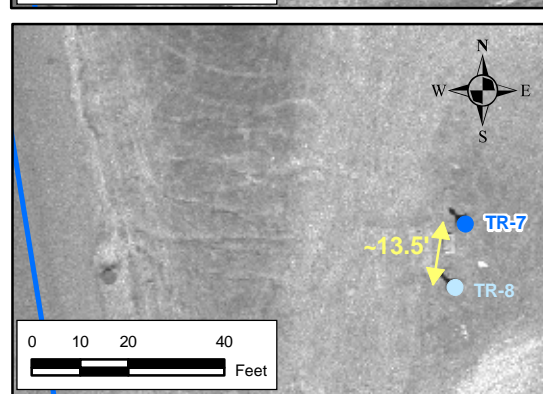
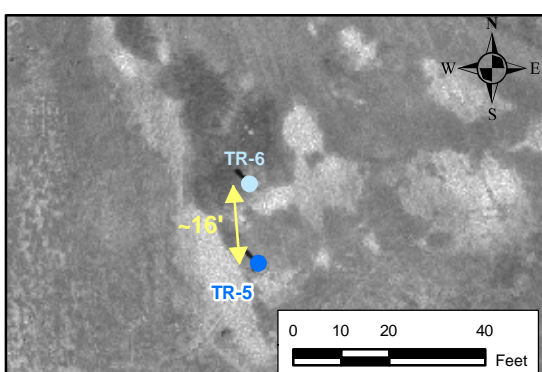
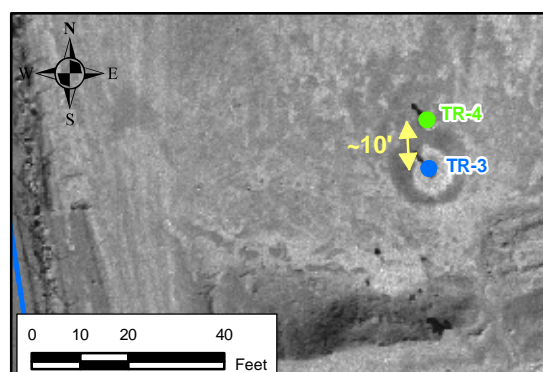
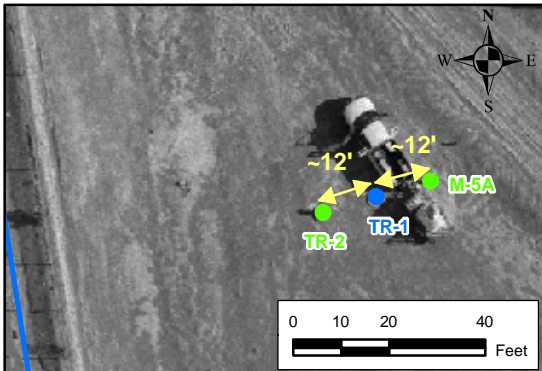
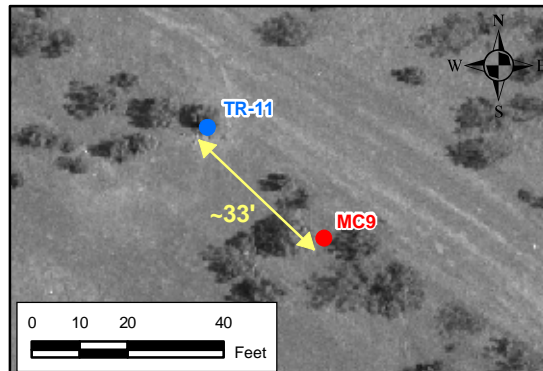
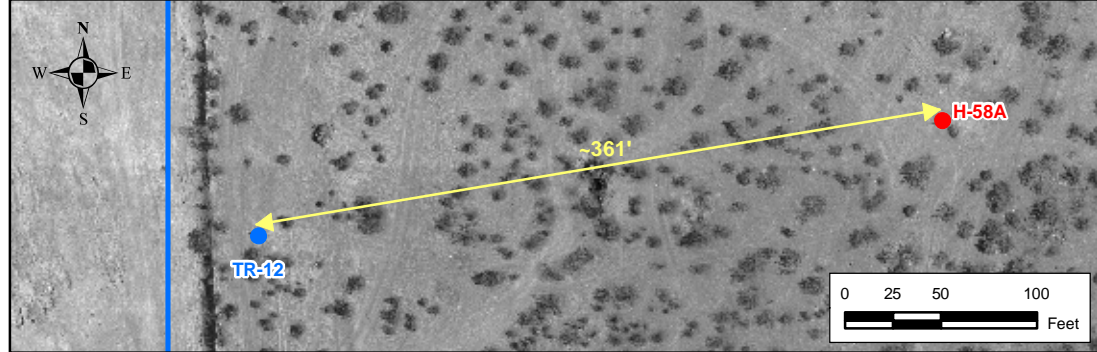
WELL NUMBER ⁽¹⁾	AQUIFER UNIT ⁽²⁾	WELL LOCATION	NORTHING ⁽³⁾	EASTING ⁽³⁾	WELL DIAMETER	TOP OF CASING	DEPTH TO TOP OF SCREEN	DEPTH TO BOTTOM OF SCREEN	TOTAL WELL DEPTH	ELEVATION TOP OF SCREEN	ELEVATION BOTTOM OF SCREEN	ELEVATION MID-POINT OF SCREEN	Sample Date ⁽⁴⁾	LABORATORY DATA		DATA VALIDATION STATUS	CATION/ANION BALANCE PERFORMED ⁽⁶⁾	GROUNDWATER				VERTICAL GRADIENT ⁽¹¹⁾																		
														TDS	EC (Lab)			Measured DTW ⁽⁷⁾	Water Density ⁽⁸⁾	GW Elevation ⁽⁹⁾	Fresh Water Head ⁽¹⁰⁾																			
														mg/L	umho/cm			ft-bgs	kg/m ³	ft-msl	ft-msl	DATE	Water Level	Fresh Water Head																
																						shallow	deep	ft/ft	ft/ft															
TR-5	MCc2	Western Property Boundary	826595.86000	26717592.13000	4	1800.27	221.0	251.0	251.5	1579.27	1549.27	1564.3	9/23/99	--	1,353	NO	NO	--	--	--	TR-6	TR-5	-0.198 ↑	-0.194 ↑																
													9/24/99	--	1,447	NO	NO	--	--	--																				
													10/7/99	--	1,447	NO	YES	12.00	1,788.27	1,788.27																				
													1/13/00	--	--	NO	NO	16.50	1,783.77	1,783.77																				
													2/4/01	--	1,130	NO	NO	13.44	1,786.83	1,786.83																				
													2/25/02	--	1,180	NO	YES	10.97	1,789.30	1,789.30																				
													2/20/03	--	--	NO	YES	8.70	1,791.57	1,791.57																				
													2/3/04	--	1,260	NO	YES	6.65	1,793.62	1,793.62																				
													2/18/05	--	1,210	NO	YES	4.01	1,796.26	1,796.26																				
													2/4/06	--	991	NO	YES	0.88	1,799.39	1,799.39																				
													3/20/06	--	--	NO	YES	--	--	--																				
													1/18/07	742	1,240	NO	YES	+0.10	997.96	1,800.37					1,799.86															
													5/14/08	748	1,220	YES	YES	+0.23	997.97	1,800.50					1,799.99															
													TR-6	MCc1	Western Property Boundary	826594.34000	26717608.38000	4	1800.36	60.0					80.0	80.0	1740.36	1720.36	1730.4	9/24/99	--	8,240	NO	NO	--	--	TR-6	TR-5	-0.220 ↑	-0.216 ↑
9/25/99	--	7,930	NO	NO	--	--	--																																	
10/7/99	--	8,240	NO	YES	34.75	1,765.61	1,765.61																																	
1/13/00	--	--	NO	NO	39.75	1,760.61	1,760.61																																	
2/4/01	--	6,480	NO	NO	38.48	1,761.88	1,761.88																																	
2/25/02	--	6,970	NO	YES	35.45	1,764.91	1,764.91																																	
2/20/03	--	--	NO	YES	39.47	1,760.89	1,760.89																																	
2/3/04	--	9,310	NO	YES	40.22	1,760.14	1,760.14																																	
2/18/05	--	11,700	NO	YES	36.93	1,763.43	1,763.55																																	
2/4/06	--	5,910	NO	YES	37.5	1,002.80	1,762.86	1,762.98																																
3/20/06	--	--	NO	YES	--	--	--																																	
1/18/07	5590	8,600	NO	YES	37.94	1,001.62	1,762.42	1,762.49																																
5/14/08	8750	10,330	YES	YES	38.11	1,003.99	1,762.25	1,762.42																																
TR-7	MCc2	Western Property Boundary	826724.99000	26716525.47000	4	1829.03	260.0	290.0	290.5	1569.03	1539.03	1554.0									9/26/99	--	1,369	NO						NO	--	--	TR-8	TR-7	-0.125 ↑	-0.123 ↑				
													9/28/99	--	1,438	NO	NO	--	--	--																				
													10/7/99	--	1,438	NO	YES	37.10	1,791.93	1,791.93																				
													1/13/00	--	--	NO	NO	40.25	1,788.78	1,788.78																				
													2/22/00	--	1,600	NO	NO	39.99	1,789.04	1,789.04																				
													2/4/01	--	1,240	NO	NO	37.22	1,791.81	1,791.81																				
													2/25/02	--	1,250	NO	YES	34.66	1,794.37	1,794.37																				
													2/20/03	--	--	NO	YES	32.04	--	--																				
													2/3/04	--	1,310	NO	YES	29.46	1,799.57	1,799.57																				
													2/18/05	--	1,260	NO	YES	26.67	1,802.36	1,801.83																				
													2/4/06	--	1,290	NO	YES	23.12	1,805.91	1,802.27																				
													3/20/06	--	--	NO	YES	--	--	--																				
													1/18/07	746	1,300	NO	YES	20.74	997.97	1,808.29	1,804.61																			
													5/14/08	800	1,290	YES	YES	17.83	998.01	1,811.20	1,807.59																			
TR-8	MCc1	Western Property Boundary	826722.81000	26716512.15000	4	1829.08	63.0	93.0	93.5	1766.08	1736.08	1751.1	10/7/99	--	2,340	NO	YES	50.35	1,778.73	TR-8	TR-7	-0.142 ↑	-0.139 ↑																	
													1/13/00	--	--	NO	NO	55.45	1,773.63					1,773.63																
													2/23/00	--	2,500	NO	NO	54.91	1,774.17					1,774.17																
													2/4/01	--	1,830	NO	NO	54.46	1,774.62					1,774.62																
													2/25/02	--	1,770	NO	YES	52.81	1,776.27					1,776.27																
													2/20/03	--	--	NO	YES	53.47	1,775.61					1,775.61																
													2/3/04	--	1,970	NO	YES	53.98	1,775.10					1,775.10																
													2/18/05	--	1,820	NO	YES	51.33	1,777.75					1,777.68																
													2/4/06	--	1,670	NO	YES	51.21	1,777.87					1,777.81																
													3/20/06	--	--	NO	YES	--	--					--																
													1/17/07	1140	1,770	NO	YES	51.90	998.26					1,777.18	1,774.09															
													5/14/08	1180	1,740	YES	YES	51.65	998.29					1,777.43	1,774.40															
													TR-9	MCc2	Western Property Boundary	827560.22000	26715752.71000	4	1854.29					230.0	250.0	250.5	1624.29	1604.29	1614.3	10/9/99	--	1,378	NO	YES	60.50	1,793.79	TR-10	TR-9	-0.056 ↑	-0.054 ↑
																														1/13/00	--	--	NO	NO	66.10	1,788.19				
2/22/00	--	1,600	NO	NO	65.74	1,788.55	1,788.55																																	
2/4/01	--	1,220	NO	NO	63.08	1,791.21	1,791.21																																	
2/25/02	--	1,220	NO	YES	60.61	1,793.68	1,793.68																																	
2/19/03	--	--	NO	YES	58.07	1,796.22	1,796.22																																	
2/3/04	--	1,310	NO	YES	55.42	1,798.87	1,798.87																																	
2/18/05	--	1,270	NO	YES	52.78	1,801.51	1,801.12																																	
2/4/06	--	1,240	NO	YES	49.16	1,805.13	1,804.73																																	
3/20/06	--	--	NO	YES	--	--	--																																	
1/17/07	778	1,300	NO	YES	46.81	997.99	1,807.48	1,807.07																																
5/13/08	834	1,330	YES	YES	43.78	998.03	1,810.51	1,810.10																																
TR-10	MCc1	Western Property Boundary	827562.53000	26715739.77000	4	1854.06	80.0	100.0	100.5	1774.06	1754.06	1764.1								10/9/99	--	2,190	NO							YES	57.35	1,796.71	TR-10	TR-9	-0.076 ↑	-0.074 ↑				
																				1/13/00	--	--	NO							NO	62.45	1,791.61								
													2/21/00	--	2,100	NO	NO	62.15	1,791.91	1,791.91																				
													2/4/01	--	2,060	NO	NO	61.09	1,792.97	1,792.97																				
													2/25/02	--	2,060	NO	YES	61.19	1,792.87	1,792.87																				
													2/19/03	--	--	NO	YES	60.75	1,793.31	1,793.31																				
													2/3/04	--	2,150	NO	YES	60.89	1,793.17	1,793.17																				
													2/18/05	--	2,050	NO	YES	60.92	1,793.14	1,793.09																				
													2/4/06	--	2,150	NO	YES	60.33	1,793.73	1,793.68																				
													3/20/06	--	--	NO	YES	--	--	--																				
													1/17/07	1840	2,530	NO	YES	61.91	998.79	1,792.15	1,792.10																			
													5/13/08	1740	2,440	YES	YES	59.87	998.72	1,794.19	1,794.14																			

TABLE 2
EVALUATION OF GEOCHEMICAL DATA - "TR" WELLS
1999 through 2008 SAMPLING EVENTS
TRONOX, HENDERSON, NEVADA
1 of 3

WELL ¹ (Aquifer Unit)	SAMPLE DATE	pH	SPECIFIC CONDUCTANCE (umho/cm)	TOTAL DISSOLVED SOLIDS (TDS) mg/L	CATIONS ²								ANIONS ²								SUM OF CATIONS meq/L	SUM OF ANIONS meq/L	Cation/ Anion %	Percent Difference ⁵ %	ACCEPTANCE CRITERIA			TDS SUM ⁶ mg/L	TDS Lab/ TDS Sum %	COMMENTS					
					Ca		Mg		Na		K		HCO ₃ ³		SO ₄		Cl		NO ₃ ⁴						ClO ₄		>5% Difference				<5% Difference	QA/QC Criteria			
					mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L					mg/L	meq/L	Yes = X				Yes = X	PASS			
TR-1 (MCc2)	10/14/1999	7.9	1,283		47.8	2.39	25.4	2.09	155	6.74	8.26	0.211	85.9	1.41	217	4.5	192	5.4	1.18	0.02	<0.004				11.4	11.4	101%	0.3%		X	PASS	733			
	1/13/2000		1,040																		<0.005														
	2/2/2001	6.8	1,130																		<0.004														
	2/25/2002	8	1,130		47	2.35	24	1.97	150	6.52	8.0	0.205	103	1.69	211	4.4	190	5.4	1.08	0.02	<0.004	0.0001			11.0	11.5	96%	-1.8%		X	PASS	739			
	2/19/2003	7.7	1,130		45	2.25	22	1.81	150	6.52	7.5	0.192	111	1.82	200	4.2	190	5.4	--		<0.004				10.8	11.3	95%	-2.6%		X	PASS	726		Missing NO ₃ data	
	2/3/2004	7.6	1,190		46	2.30	24	1.97	150	6.52	7.6	0.194	113	1.85	210	4.4	190	5.4	<1		<0.004				11.0	11.6	95%	-2.6%		X	PASS	741			
	2/18/2005	7.9	1,120		45	2.25	23	1.89	150	6.52	7.9	0.202	104	1.70	200	4.2	180	5.1	<1		<0.004				10.9	10.9	99%	-0.4%		X	PASS	710			
	2/2/2006	7.9	1,170		46	2.30	24	1.97	150	6.52	7.4	0.189	88	1.44	210	4.4	180	5.1	1.1	0.02	<0.004				11.0	10.9	101%	0.4%		X	PASS	707		HCO ₃ data from 3/20/06 was used in the cation/anion balance	
	3/20/2006												88	1.44							<0.004														
	1/18/2007	7.8	1,190	678	46	2.30	25	2.06	160	6.96	7.4	0.189	100	1.64	190	4.0	200	5.6	1.1	0.02	<0.004				11.5	11.2	102%	1.1%		X	PASS	730	93%		
	5/14/2008	8.2	1,230	740	44	2.20	23	1.89	150	6.52	7.4	0.189	73.5	1.20	230	4.8	200	5.6	1.2	0.02	<0.004				10.8	11.6	93%	-3.8%		X	PASS	729	101%		
TR-2 (MCf1) (deep)	10/14/1999	7.5	4,080		132	6.59	108	8.89	331	14.40	14.9	0.381	85.2	1.40	490	10.2	868	24.5	0.23	0.00	<0.004				30.3	36.1	84%	-8.8%	X			2,029			
	1/13/2000																				0.026	0.00026													
	2/2/2001	7.6	932																		<0.004														
	2/25/2002	8.2	941		31	1.55	20	1.65	130	5.65	6.5	0.166	103	1.69	160	3.3	144	4.1	1.4	0.02	0.034	0.0003			9.0	9.1	99%	-0.5%		X	PASS	601			
	2/19/2003	8.2	955		84	4.19	96	7.90	120	5.22	13	0.332	108	1.77	180	3.7	150	4.2	1.5	0.02	0.0046	0.00005			17.6	9.8	181%	28.7%	X			753		Anomalous Ca and Mg data	
	2/3/2004	8.1	1,000		32	1.60	22	1.81	140	6.09	6.5	0.166	104	1.70	170	3.5	140	3.9	1.5	0.02	<0.004				9.7	9.2	105%	2.4%		X	PASS	615			
	2/18/2005	8.1	933		31	1.55	21	1.73	140	6.09	7.1	0.182	102	1.67	160	3.3	130	3.7	1.4	0.02	0.018	0.0002			9.5	8.7	110%	4.7%		X	PASS	591			
	2/2/2006	8.2	960		29	1.45	19	1.56	130	5.65	6.1	0.156	100	1.64	180	3.7	140	3.9	1.4	0.02	<0.004				8.8	9.4	94%	-2.9%		X	PASS	606		HCO ₃ data from 3/20/06 was used in the cation/anion balance	
	3/20/2006												100	1.64							<0.004														
	1/18/2007	8.1	990	560	31	1.55	21	1.73	140	6.09	6.3	0.161	110	1.80	160	3.3	180	5.1	1.3	0.02	<0.004				9.5	10.2	93%	-3.6%		X	PASS	650	86%		
	5/14/2008	8.2	965	566	29	1.45	20	1.65	130	5.65	6.2	0.159	92.3	1.51	180	3.7	140	3.9	1.5	0.02	<0.004				8.9	9.2	96%	-1.8%		X	PASS	599	94%		
TR-3 (MCc2)	10/14/1999	8.1	1,330		42.3	2.11	23.1	1.90	173	7.52	9.63	0.246	86.9	1.42	200	4.2	206	5.8	0.96	0.02	<0.004				11.8	11.4	103%	1.6%	X			742			
	1/13/2000																				0.007	0.0001													
	2/4/2001	7.8	1,060																		0.033	0.0003													
	2/25/2002	7.9	1,080		41	2.05	18	1.48	130	5.65	6	0.153	97.4	1.60	160	3.3	150	4.2	1.6	0.03	0.02	0.0002			9.3	9.2	102%	0.8%		X	PASS	609			
	2/19/2003	8	1,110		42	2.10	19	1.56	140	6.09	5.9	0.151	99.7	1.63	210	4.4	190	5.4	1.2	0.02	0.011	0.0001			9.9	11.4	87%	-7.0%	X			708			
	2/3/2004	8	1,140		47	2.35	22	1.81	150	6.52	6.8	0.174	100	1.64	190	4.0	180	5.1	1.2	0.02	<0.004				10.9	10.7	102%	0.8%		X	PASS	696			
	2/18/2005	8	1,080		47	2.35	21	1.73	150	6.52	6.9	0.176	98.5	1.61	190	4.0	170	4.8	1.1	0.02	0.012	0.0001			10.8	10.4	104%	1.9%		X	PASS	683			
	2/2/2006	8	999		43	2.15	20	1.65	140	6.09	6.2	0.159	77	1.26	190	4.0	180	5.1	1.0	0.02	0.0049	0.0000			10.0	10.3	97%	-1.3%		X	PASS	657		HCO ₃ data from 3/20/06 was used in the cation/anion balance	
	3/23/2006												77	1.26							<0.004														
	1/18/2007	7.9	1,150	560	45	2.25	21	1.73	150	6.52	6.4	0.164	100	1.64	190	4.0	180	5.1	1.1	0.02	<0.004				10.7	10.7	100%	-0.1%		X	PASS	694	81%		
	5/14/2008	8.1	1,130	566	48	2.40	21	1.73	150	6.52	6.2	0.159	59.5	0.98	190	4.0	180	5.1	0.9	0.01	<0.004				10.8	10.0	108%	3.8%		X	PASS	656	86%		
TR-4 (MCf1) (deep)	10/14/1999	8.7	1,930		57.8	2.88	41.5	3.41	214	9.31	15.1	0.386	74.8	1.23	230	4.8	374	10.5	1.32	0.02	0.065	0.0007			16.0	16.6	96%	-1.8%		X	PASS	1,009			
	1/13/2000																				0.029	0.0003													
	2/4/2001	8	1,080																		0.011	0.0001													
	2/25/2002	8.2	1,440		94	4.69	21	1.73	160	6.96	17	0.435	78.9	1.29	150	3.1	300	8.5	1.5	0.02	0.015	0.0002			13.8	12.9	107%	3.4%		X	PASS	827			
	2/19/2003	8.2	1,700		110	5.49	26	2.14	160	6.96	14	0.358	69.2	1.13	170	3.5	430	12.1	1.5	0.02	0.012	0.0001			14.9	16.8	89%	-5.9%	X			981			
	2/3/2004	7.2	1,760		130	6.49	24	1.97	170	7.39	15	0.384	67.1	1.10	160	3.3	430	12.1	1.6	0.03	0.0081	0.0001			16.2	16.6	98%	-1.0%		X	PASS	996			
	2/18/2005	8	1,520		120	5.99	23	1.89	160	6.96	13	0.332	71.3	1.17	160	3.3	350	9.9	1.4	0.02	0.0078	0.0001			15.2	14.4	105%	2.7%		X	PASS	897			
	2/2/2006	8.2	1,430		110	5.49	23	1.89	160	6.96	11	0.281	58	0.95	170	3.5	340	9.6	1.4	0.02	0.0075	0.0001													



- Monitor Well with Screen in the Alluvial Aquifer (Qal)
- Monitor Well with Screen in the Muddy Creek Fine Grain Facies (MCf1)
- Monitor Well with Screen in the Muddy Creek Coarse Grain Facies 1 (MCC1)
- Monitor Well with Screen in the Muddy Creek Coarse Grain Facies 2 (MCC2)



- Legend**
- Well Clusters
 - Tronox Facility
- Land Ownership**
- BMI
 - Chemstar
 - Olin (Formerly Pioneer)
 - Timet
 - Township/Range Section No. in the Mt Diablo Meridian

DESIGNED BY:	NO:	DESCRIPTION:	DATE:	BY:
M. Flack				
DRAWN BY:				
M. Scop				
CHECKED BY:				
M. Flack				
APPROVED BY:				
M. Flack				

ENSR AECOM

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

WELL LOCATION MAP

Vertical Gradient Assessment
 Tronox Facility
 Henderson, Nevada

SCALE: As Noted DATE: 9/18/2008 PROJECT NUMBER: 04020-023-160

FIGURE NUMBER:
1

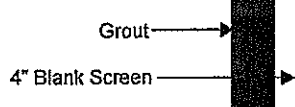

SHEET NUMBER:
X

ATTACHMENT A

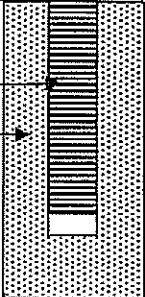
**Exploratory Boring Logs and Well Completion Information
Groundwater Monitoring Wells MC-9 and H-58A**

BEGUN 9/82 FINISHED 6/9/82 LOGGED BY CAD DRILLED BY Converse, Wad... DRILL HOLE MC
 ELEV. 1715.76 TOTAL DEPTH 55' LOCATION 250' East of well 36, on K-M property, Henderson, NV MC-9

FOOTAGE		THICK- NESS	RECOV- ERY	LITHOLOGY	REMARKS
FROM	TO				
0	5			sand & gravel - brown to black	drilled w/ benzoinite. runs
5	10			sand & gravel - as above, local lt tan coaling	
10	20			sand & gravel - as above, local lt tan coaling, local clayey intervals rare gyp between 15-20'	odor @ 20' water level 7/8/82: 25.1 ft.
20	40			sand & gravel - local tan coaling @ 31-32' rare gyp @ 35' & 38' @ 39' = local tan coaling	
40	50			sand & gravel - black to brown, rare tan coaling local thin harder, ductile layers @ 41' & 43' @ 45-47' = caliche fragments interspersed w/ gravel	
50				Mudstone - clay reddish brown	

Time	PID Reading (ppmv)	Blow Count (per 6 inches)	Sample Number	Sample Interval	Depth (ft)	Lithology	DESCRIPTION OF SUBSURFACE MATERIALS	Well Construction
							Borehole Location: H-58A Total Depth: 59 Feet Bgs Depth to Bedrock: N/A Depth to Water: 32 Feet Bgs Groundwater Elevation (MSL): N/A	
7:26						GM	Tan silty sand with small gravel.  Grout → 4" Blank Screen →	
7:32				5				
7:40				10				
7:47				15				
7:51				20				
7:57				25				
Date Started/Completed: 7/12/04 Drilling Agency/Driller: WDC Exploration & Wells Equipment Used: CME- 85 Drilling Method/Fluid: Hollow Stem Auger Hammer Weight/Drop Distance: 140 lb./ 30 Inches Borehole Diameter: 10 Inches Completion: Groundwater Monitoring Well							Logged by: Keith Stewart Checked by: Keith Stewart Comments:	
							STEWART ENVIRONMENTAL, INC.	
							File No.: 04-521.1	
							LOG OF BORING NO.: H-58A	
							Page 1 of 3	

Time	PID Reading (ppmv)	Blow Count (per 6 inches)	Sample Number	Sample Interval	Depth (ft)	Lithology	DESCRIPTION OF SUBSURFACE MATERIALS	Well Construction
							Borehole Location: H-58A Total Depth: 59 Feet Bgs Depth to Bedrock: N/A Depth to Water: 32 Feet Bgs Groundwater Elevation (MSL): N/A	
8:02					30	SW	<p>Grout</p> <p>4" Blank Screen</p> <p>Bentonite</p> <p>Sand</p> <p>4" 0.020 Slotted Screen</p>	
8:06				35		Brown fine to coarse sand with volcanics. Water		
8:11				40				
8:25				45	SW CL	Dark brown clean coarse gravel. Heavily cemented volcanic sand and gravel.		
8:45				50				
Date Started/Completed: 7/12/04 Drilling Agency/Driller: WDC Exploration & Wells Equipment Used: CME- 85 Drilling Method/Fluid: Hollow Stem Auger Hammer Weight/Drop Distance: 140 lb./30 Inches Borehole Diameter: 10 Inches Completion: Groundwater Monitoring Well							Logged by: Keith Stewart Checked by: Keith Stewart Comments:	
							STEWART ENVIRONMENTAL, INC.	
							File No.: 04-521.1	
							LOG OF BORING NO.: H-58A	
							Page 2 of 3	

Time	PID Reading (ppmv)	Blow Count (per 6 inches)	Sample Number	Sample Interval	Depth (ft)	Lithology	DESCRIPTION OF SUBSURFACE MATERIALS	Well Construction
							Borehole Location: H-58A Total Depth: 59 Feet Bgs Depth to Bedrock: N/A Depth to Water: 32 Feet Bgs Groundwater Elevation (MSL): N/A	
9:03					55	CH	Muddy Creek, brown clay 4" 0.020 Slotted Screen Sand	
9:05					60		End of boring	
					65			
					70			
					75			
Date Started/Completed: 7/12/04 Drilling Agency/Driller: WDC Exploration & Wells Equipment Used: CME- 85 Drilling Method/Fluid: Hollow Stem Auger Hammer Weight/Drop Distance: 140 lb./30 Inches Borehole Diameter: 10 Inches Completion: Groundwater Monitoring Well							Logged by: Keith Stewart Checked by: Keith Stewart Comments:	
							STEWART ENVIRONMENTAL, INC. File No 04-521.1	
							LOG OF BORING NO.: H-58A Page 3 of 3	

Well No.: H58A Construction Table	
Blank PVC Size	Four Inch
Blank PVC Interval	+2 Feet to 37 Feet
Screen PVC Size	Four Inch 0.020
Screen PVC Interval	37 Feet to 57 Feet
Sand Size	10 x 20
Sand Interval	35 Feet to 58 Feet
Bentonite Interval	32 Feet to 35 Feet
Grout Interval	0 Feet to 32 Feet