



STEVEN A. THOMPSON
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

BRAD HENRY
Governor

October 04, 2007

Ursula Lennox (6SF-LL)
US EPA – Region VI
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Re: Long Term Monitoring at Tar Creek, a part of After Action Monitoring

Dear Ursula:

Please find the analytical results for the eighth round of samples of the Long Term Monitoring (LTM) project at Tar Creek for the Roubidoux aquifer. The results are presented in the report attached for your review.

Please let me know if you have any comments. Thank you for your attention to this matter. If you have any questions please call me at (405) 702-5124.

Sincerely,

A handwritten signature in black ink that reads 'David A. Cates'. The signature is written in a cursive style with a long horizontal stroke at the end.

David A. Cates, P.E.
Land Protection Division

Long Term Monitoring Report (Eighth of Ten Semi-Annual Roubidoux Samples)
April 2007

Introduction:

The eighth round of samples of the Long Term Monitoring (LTM) project at Tar Creek for the Roubidoux aquifer were collected in April 2007. The analytical results are shown in Table 1. The previous results for the LTM wells are also included in the table. A map with the well locations (Figure 1) is attached along with graphs of the Picher #5 iron and sulfate concentrations over time (Figure 2), and a Piper Diagram for the water samples from the LTM wells (Figure 3).

The primary and secondary maximum contaminant levels (MCLs) are identified in the header of the table for data comparison. The tolerance limits and Roubidoux background concentrations for the indicator parameters of mine water contamination are also provided in the header and in the footnotes. The indicator parameters are: sulfate, iron, and zinc. The values for tolerance limits and Roubidoux background concentrations, respectively, are: 82 mg/l & 25 mg/l for **sulfate**; 207 ug/l & 61.5 ug/l for **iron**; and 43 ug/l & 8.8 ug/l for **zinc**. These parameters and their values were determined in Phase I of After Action Monitoring (AAM) of the Roubidoux at Tar Creek and are included in the Phase II AAM report "Summary of Roubidoux Water Quality Tests" (September, 2002).

QA/QC: Blanks, RPD, Cation-Anion Balance:

The reporting limits (detection limits) for all the parameters analyzed following the methods for metals analyses defined in the QAPP for the LTM project (EPA 200.8) are below the respective MCL values.

The Miami #1 well was back in service at the time of sampling but the nearby Miami #3 well was again substituted as the Roubidoux sample from outside the mine area for inter-well water quality comparisons. The Miami #3 well is located about 1/2 mile south of the Miami #1 well as shown on the figure. It is of similar age and completed similarly as indicated on the list of LTM wells. Historical water quality and production data is also available for the Miami #3 well.

Two additional wells were again sampled this time to provide a baseline database for Roubidoux background concentrations and tolerance limit calculations. These two wells are the Miami #11 located in the NW/4 NW/4 NW/4 of Section 16-T28N-R23E, about 3 miles northeast of the Miami #1 well and the Rural Water District 7 #2 well located in the NE/4 SE/4 SE/4 of Section 21-T29N-R22E about 4 miles west of the Cardin #1 well. Both are relatively new wells and the details are included in the list of LTM wells.

The blanks for all three days of sampling showed no exceedances of detection limits for all parameters. Blanks were collected at three sites (Picher #6, Commerce #4 & RWD4#3) and are flagged in Table 1. For the three duplicates taken this round of sampling, the relative percent difference (RPD) calculations showed mostly (107 of 111) less than 5 percent difference between the duplicate concentrations and the respective sample concentrations. At the Miami #11 well a 16.67% and 28.67% difference between the sample and the duplicate was calculated for total and dissolved iron, respectively. The 0.065 & 0.035 mg/l concentration values (for total and dissolved iron) compare to the 0.055 & 0.026 mg/l concentrations in the duplicate samples.

The only other RPD greater than 5% was at the RWD4#3 well where total and dissolved iron values were 0.024 & 0.021 mg/l concentration for the sample, and 0.022 & 0.020 mg/l in the duplicate, resulting in RPDs of 10.9% and 6.27%, respectively. These RPDs do not indicate a problem. The cation-anion balance calculations were good (< 10 %) for all but one sample. The Quapaw #5 had a balance of 11.02 %.

Results:

The Commerce #5, the Quapaw #4, and the Rural Water District 4 #3 (Bluehole well) again have the best water quality, with conductivity values near 300 uS/cm, and total dissolved solids (TDS) concentrations less than 200 mg/l. The Cardin #1, Miami #3 and Miami #11 wells also met these conditions. The concentrations of sulfate, iron and zinc, the indicator parameters of mine water contamination, are below tolerance limits and represent background concentrations at the Commerce #5, Miami #3, Miami #11 and the RWD4#3 wells. Iron at the Cardin#1 and the RWD7#1 was above background but below tolerance limits. For the first time, zinc at the Quapaw#4 well was detected and the concentrations were above tolerance limits. The water from the Picher #5 was below the tolerance limits for all three indicator parameters but is representative of background concentrations for only zinc.

The primary MCL for lead (15 ug/l) was not exceeded in any samples and all samples tested less than reporting limits of 5 ug/l. There were no exceedances of primary drinking water standards from any of the wells. Secondary standards were violated in the Fernandez (Fe, SO₄ & TDS), Picher #6 (Fe), Quapaw #5 (Fe, SO₄, TDS) and RWD7#1 (Cl). The well owners will be notified of these LTM results. Two wells showed impacts by mine water: the Quapaw #5 and the Fernandez. Mine water impacts are concluded when all the indicator parameter concentrations exceed the tolerance limits. These are shown in bold type in Table 2 below.

Tests at the Quapaw #5 continue to show that the Roubidoux water from this well is of very poor quality, exceeding secondary standards for iron, total dissolved solids (TDS), and sulfate. The iron, TDS, and sulfate concentrations observed are 2,450 ug/l, 1,000 mg/l and 266 mg/l, respectively. Although it is below the MCL (10 ug/l), again an arsenic concentration of 3.7 ug/l was detected and a total manganese concentration (26 ug/l) is below the standard of 50 ug/l. Concentrations for all three of the indicator parameters (264 mg/l; 2,450 ug/l; and 114 ug/l, respectively for sulfate, iron and zinc) are greater than tolerance limits at this well. Although the water is considered treatable (TDS < 3,000 mg/l), this well is not hooked up to the public water system due to poor water quality and low yield. In the case of the Quapaw #5 well, which is relatively new and has casing installed to a depth of 850 feet, it is concluded that, since all three indicator parameters are exceeded, the Roubidoux aquifer is impacted by mine water near this well.

Concentrations for all three indicator parameters (285 mg/l, 477 ug/l, & 273 ug/l, respectively for sulfate, iron, and total zinc) are greater than tolerance limits at the Fernandez well. This is an old well originally installed in the 1920's at the Ontario smelter site. The previous data and the filtered zinc concentration for this sampling event (<5 ug/l) suggest that the well itself (not the Roubidoux) is impacted by mine water probably due to inadequate or corroded casing across the Boone.

Table 2: Concentrations of Indicator Parameters in LTM Wells (November 2006).

WELL	Zinc (ug/l)		Iron (ug/l)		Sulfate (mg/l)
	Total	Dissolved	Total	Dissolved	
Background Conc.	8.8		61.5		25
Tolerance Limit	43		207		82
Secondary MCL	5,000		300		250
Cardin #1	<5	<5	96	76	28.2
Commerce #4	28	<5	151	129	125
Commerce #5	<5	<5	42	31	12.1
Fernandez	999	<5	681	477	285
Miami #1	Ns	Ns	Ns	Ns	Ns
Miami #3	<5	<5	<20	<20	11.5
*Miami #11	<5	<5	60	30.5	11.6
Picher #5	<5	<5	116	110	57.2
*Picher #6	<5	<5	326	304.5	176
Picher #7	<5	<5	79	75	198
Quapaw #4	43	41	<20	<20	12.5
Quapaw #5	121	114	2,620	2,450	264
*RWD4 #3	<5	<5	23	20.5	<10
RWD7 #1	<5	<5	118	95	13

- Note: Means are indicated by an asterisk near the well names with duplicate samples; Shaded area indicates value at or below background; A Box indicates value greater than SMCL; Bold values are above tolerance limits; Detection limit values were used in calculation of means; Ns - not sampled.

The concentrations for two of the three indicator parameters observed at the Picher #6 well (iron and sulfate) exceed tolerance limits, so this well is considered impacted by mine water and probable impacts to the Roubidoux aquifer are suggested. Specifically, the iron and sulfate concentrations at the Picher #6 exceeded tolerance limits, but the zinc concentrations represent background. The sulfate and iron concentrations are: 176 mg/l and 305 ug/l, respectively. The Picher #6 continues to show improved water quality compared to the first samples collected after the well was completed in October 2000. It had been purged for about 1 week prior to collecting samples for analyses and the sulfate and iron concentrations were tested at 307 mg/l and 2,304 ug/l, respectively. The effects of long term purging prior to sampling were evaluated during the October 2004 LTM monitoring event. Increased purging of the Picher #6 well to 4 days from 24 hours or less did not show an increase in concentrations compared to previous sampling events. The concentrations of most parameters were about the same as before with normal purging. The probable explanation for the improved iron and sulfate concentrations (compared to the initial sample) is the presence of an inflatable packer installed in the well in 2001. The packer prevents inflow of mine water into the well through the casing. During the current sampling event the packer inflation vessel (PIV), that is used to maintain pressure in the packer via the inflation line, was missing (i.e., presumably stolen). The water level above the packer (239 feet bgl) as determined from the airline pressure (232 psi) indicates a packer seal may not be present. This well is not hooked up to the distribution system and is not used as a public water supply well.

The iron concentration in the Picher #5 well was similar to the last sampling event and both iron and sulfate are significantly lower than previous sampling events (~2 years ago) as seen in Table 1 and the graph (Figure 2). The higher than normal iron concentration at the Picher #5, observed in April 2004 and the spike in 2001, were attributed to holes in the production pipe that allows some of the water to circulate out of the production pipe, down the casing, into the water column, and back into the pipe through the downhole pump. The well was taken out of service shortly after that sampling event due to low water discharge which turned out to be caused by holes in the production pipe. As a result of the frequent workovers to repair holes in the production pipe, the City replaced the iron based production pipe with stainless steel pipe (in January 2006) to reduce corrosion. This change may result in lower iron concentrations in the future samples through reduced pipe corrosion. The high iron in the water was related to production pipe corrosion and not to inflow from the Boone or impacted Roubidoux aquifer.

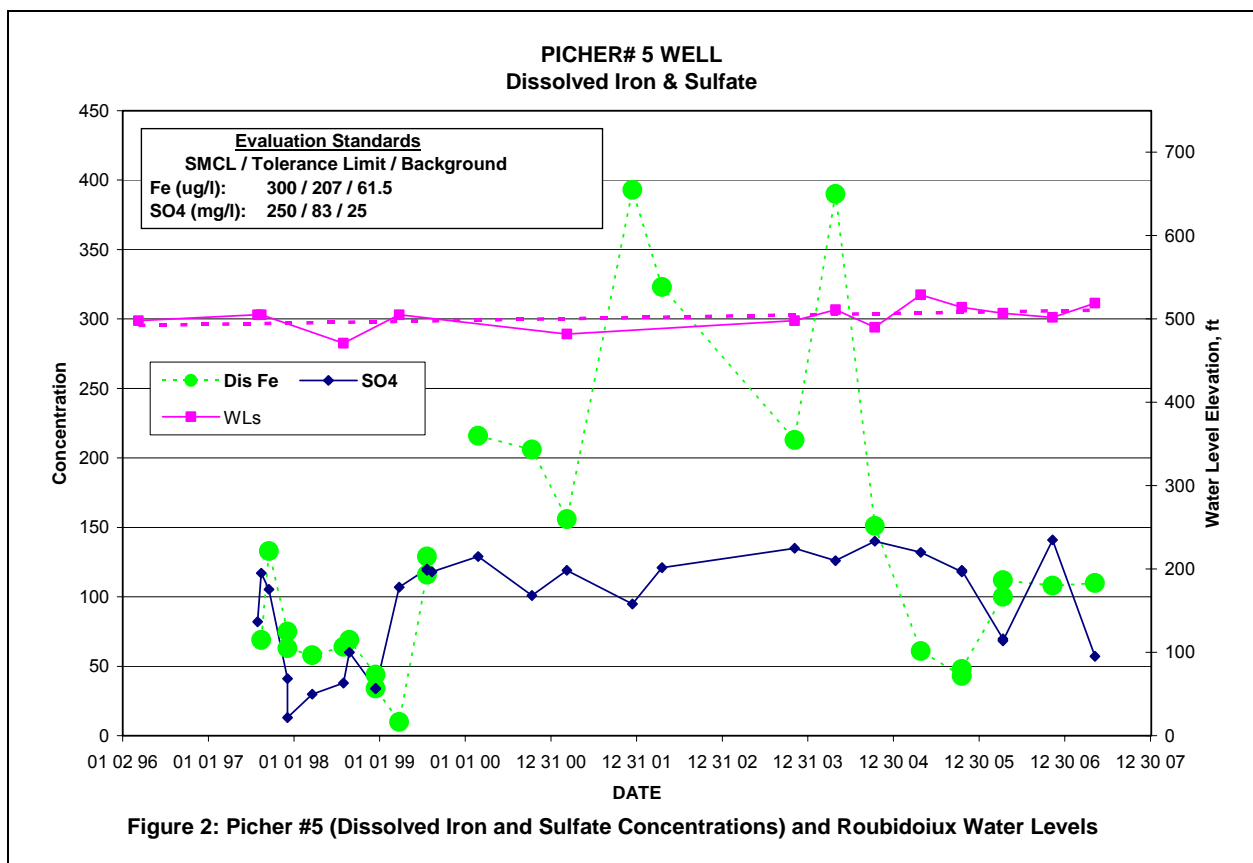


Figure 2: Picher #5 (Dissolved Iron and Sulfate Concentrations) and Roubidoux Water Levels

Concentrations greater than tolerance limits for one of the three indicator parameters were observed at the Commerce #4 (sulfate = 125 mg/l) and the Picher #7 (sulfate = 198 mg/l). The tolerance limit for sulfate is 82 mg/l. While the iron concentrations in these wells are above Roubidoux background values, both iron and zinc concentrations are below tolerance limits of 207 and 43 ug/l, respectively. **Possible** impacts from mine water to the Roubidoux in these two wells are indicated.

The Piper diagram (Figure 3) of the April 2007 LTM water quality data shows that five wells are impacted slightly by mine water. This is graphically displayed in the lower right triangle of the

diagram where the points representing the anion percentage composition of the water samples from the five wells (Commerce #4, Fernandez #1, Picher #6, Picher #7, and Quapaw #5) plot midway between the mine water and Roubidoux background endpoints. The RWD7 #2 well plots towards the Na and Cl apexes of the cation and anion triangles, respectively. The well is located outside the Tar Creek Superfund site by a couple of miles to the west in the direction that the Roubidoux dips. The high percentage of sodium and chloride in the Roubidoux is result of its greater depth.

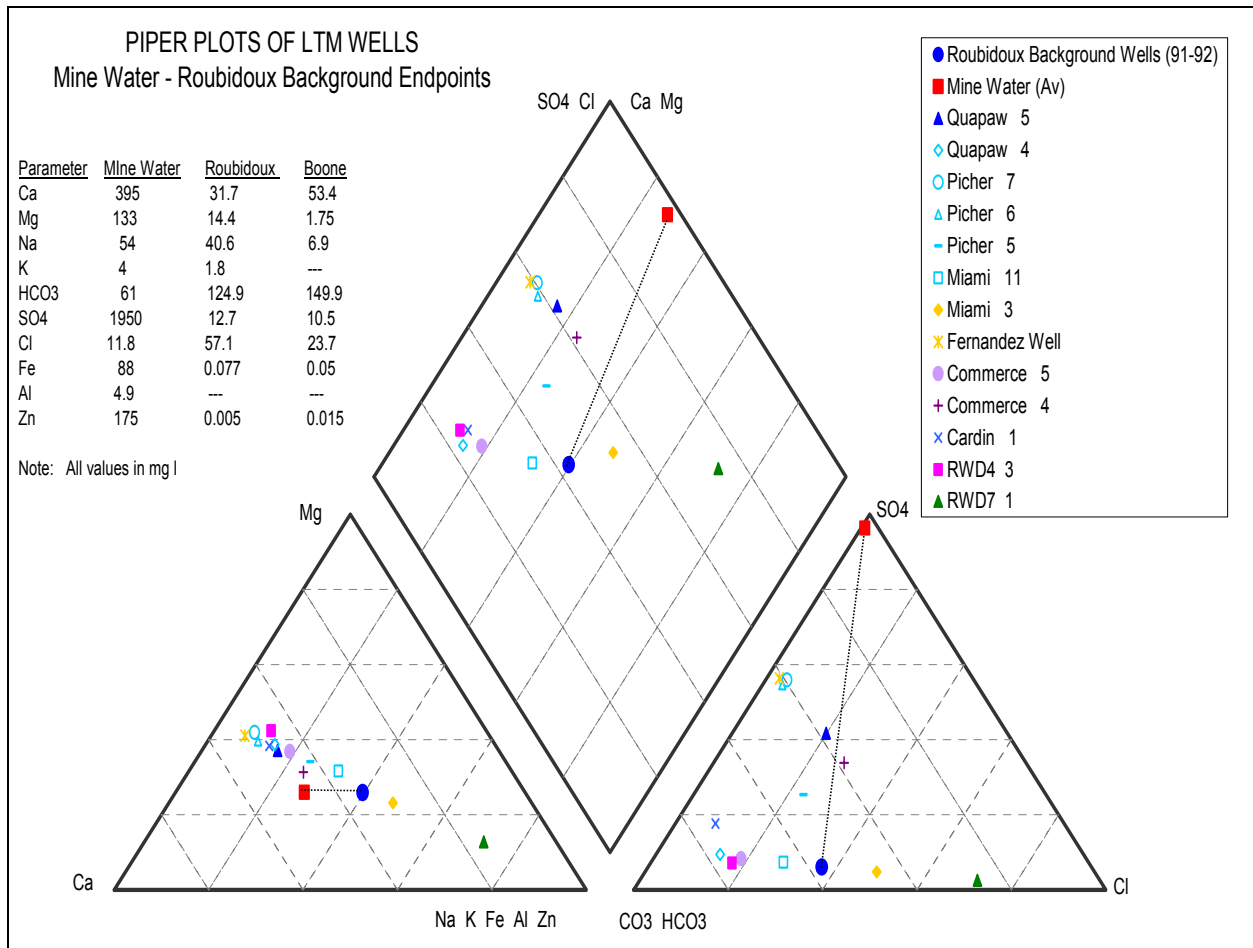


Figure 3 – Piper Diagram of LTM Water Quality (LTM wells sampled in November 2006).

Water level elevations for the LTM wells are shown in Table 2 and a comparison of the elevations with those taken in 2004 are shown in Table 3. The differences are variable with an overall rise in the Roubidoux water level elevation of 27 feet, most of which is at the Quapaw #5 well. The Roubidoux water level elevations at the Picher 5 well are plotted on Figure 2 and show a slight increasing trend over the ten years of production. The current Roubidoux potentiometric surface map as of May 9, 2007, is depicted on Figure 1. It shows a large pumping center in Miami.

The following discussion was obtained from data in the USGS web site of ‘water data’ for Oklahoma under the ‘real time’ and ‘field water-level measurements’ categories (<http://waterdata.usgs.gov/ok/nwis/gw>). The Miami well #9 shows a decline of 14 feet over a 3.5

month period from late April to mid-August 2007 which indicates increased summer time water usage. The NEO well in Miami (SWNWSE-30-T28N-R23E) showed a Roubidoux water level rise of about 100 feet in 1986 associated with the shut down of a large water user, the BFG plant. This well has records of water levels dating back to 1907 when it was artesian (28 feet above ground level). In April 2004 the depth to water was 392 feet.

Table 2: Roubidoux Water Level Elevations in LTM Wells

ID	Well Name	Loc	ID	Twn-Rng	Elev	Date	DTW	WL Elev
C1	Cardin #1	Swsese	19	T29N-R23E	820	5/08/07	266	554
C4	Commerce #4	Nwnenw	6	T28N-R23E	812	5/08/07	371	441
C5	Commerce #5	Nwsenw	6	T28N-R23E	810	5/08/07	384	426
M3	Miami #3	Nenw	31	T28N-R23E	783	5/08/07	455	328
M11	Miami #11	Nwnwnw	16	T28N-R23E	832	5/08/07	417	415
P5	Picher #5	Sesene	29	T29N-R23E	812	5/08/07	293	519
P7	Picher #7	Swsesw	20	T29N-R23E	814	5/08/07	285	529
Q4	Quapaw #4	Nwnwnw	1	T28N-R23E	845	5/09/07	432	413
Q5	Quapaw #5	Swswe	35	T29N-R23E	850	5/09/07	287	563
RWD4-3	RWD4 #3	Nesesw	30	T29N-R24E	895	5/09/07	279	616
RWD7-2	RWD7 #2	Nesese	21	T29N-R22E	825	5/09/07	242	583

Table 3: Water Level Elevations

	Date	Date	Difference
Well	April 2004	May 2007	
Commerce #5	423	426	3
Picher #5	511	519	8
Picher #7	513	529	16
Quapaw #4	435	413	-22
Quapaw #5	525	563	38
RWD4 #3	632	616	-16
		Net Change =	27

Conclusions:

Based on analyses of water quality data obtained from the Roubidoux wells the following conclusions are made:

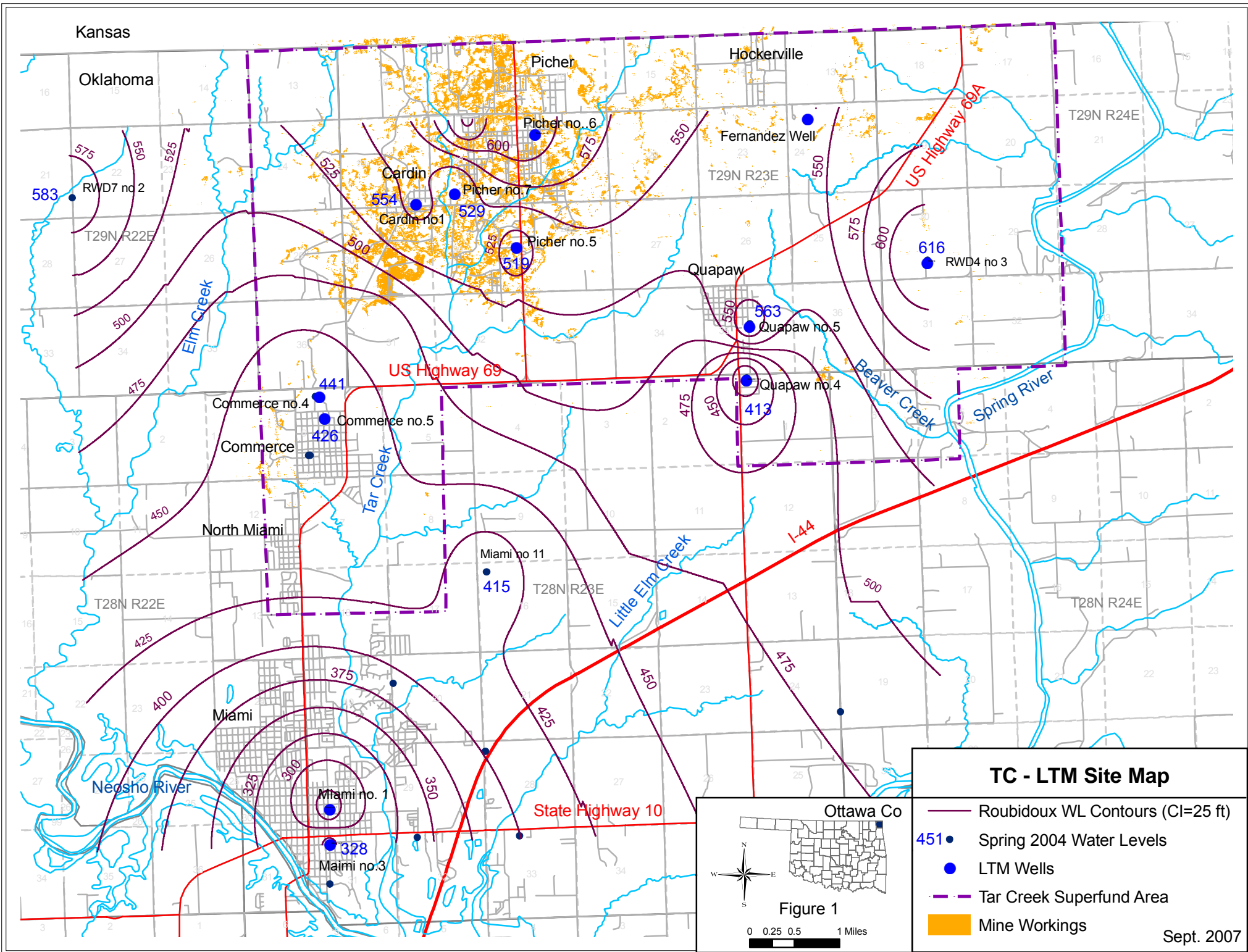
- The Roubidoux near the Quapaw #5 well is contaminated by mine water.
- The Fernandez well and the Picher #6 well are impacted by mine water probably through the well casings.
- The Picher #7 and the Commerce #4 wells are slightly impacted by mine water with exceedances of one indicator parameter above tolerance limits.

- Within the mine area, the Commerce #5 and the RWD4 #3 wells, in addition to the Miami #3 and Miami #11 wells (outside the mining area) are not affected by mine water with concentrations of indicator parameters representative of background levels. The Quapaw #4, Picher #5, and Cardin #1 wells (within the mine area), and the RWD7 #2 well (outside the mining area) are also not impacted by mine water but show elevated concentrations of some indicator parameters above background levels.
- The Piper diagram indicates varying degrees of possible mine water impacts at the Quapaw #5, Fernandez well, Picher #6, Picher #7, Commerce #4, and Picher #5 wells.
- Both increases and decreases in the Roubidoux water levels within the mining area are observed over the last 3 years. A slight increase in Roubidoux water level is thought to best represent the overall conditions, as seen in the slight increasing trend over the last 10 years at the Picher #5 well (Figure 2). However, significant decreases are observed at the Quapaw #4 and RWD4 #3 wells (Table 3), which are large water producers in the area.
- A large cone of depression in the Roubidoux potentiometric surface has formed at Miami from the many closely spaced wells there. This pumping center is expected to deepen and expand with time due to continued economic growth and installation of additional new wells.

Recommendations:

The long term monitoring program is scheduled to end in the April 2008 after two more sampling events. Since mine water affects are concluded at 5 of 10 wells in the mine area and the Roubidoux aquifer is impacted by mine water near at least one site, continuation of the monitoring program is recommended for another 5 years. However, it is suggested that sample collection be conducted only once annually (i.e., during the summer time when pumping of the Roubidoux water supplies is greatest).

Figure 1 – Map of Site and Long Term Monitoring Wells



Kansas

Oklahoma

Picher

Hockerville

Picher no.6

Fernandez Well

T29N R24E

583 RWD7 no 2

Cardin

Cardin no.1

Picher no.7

Picher no.5

Quapaw

616 RWD4 no 3

Elm Creek

US Highway 69

US Highway 69A

Quapaw no.5

Commerce no.4

Commerce no.5

Commerce

Quapaw no.4

450

North Miami

Miami no.11

415

I-44

T28N R22E

Little Elm Creek

T28N R24E

425

Miami

Miami no.1

328

Miami no.3

State Highway 10

Neosho River

Ottawa Co



Figure 1

0 0.25 0.5 1 Miles

Sept. 2007

List of Long Term Monitoring Wells

- 1a. **Miami # 1:** SW NE SW S30-T28N-R23E (N 36° 52' 30.9'' W 94° 52' 23.4''); Public Water Supply Well; Elevation: 795'; Total Depth: 1233'; Casing Depth: 433'; Pump: 846'.
- 1b. **Miami #3:** SWNENW S31-T28N-R23E (N 36° 52' 06.0'' W 94° 52' 22.0''); Public Water Supply Well; Elevation: 783'; Total depth: 1252'; Casing Depth: 460'; Pump: 710'; al: 700'.
2. **Commerce # 5:** NW SE NW S6-T28N-R23E (N 36° 56' 19.4'' W 94° 52' 17.9''); Monitoring Well; Elevation: 810'; Total depth: 1100'; Casing Depth: 8'' @ 850'; Pump: 795'.
3. **Commerce # 4:** NW NE NW S6-T28N-R23E (N 36° 56' 31.9'' W 94° 52' 21.1''); Public Water Supply Well; Elevation: 812'; Total depth: 1,250'; Casing Depth: 680'; Pump: 680'.
4. **Cardin # 1:** SW SE SE S19-T29N-R23E (N 36° 58' 23.3'' W 94° 51' 07.2''); Public Water Supply Well; Elevation: 817'; Total depth: 1150'; Casing Depth: 500'; Pump: 615'.
5. **Picher # 6:** SE NW NW S21-T29N-R23E (N 36° 59' 00.7'' W 94° 49' 38.7''); Monitoring Well; Elevation: 822'; Total depth: 1100'; Casing Depth: 850'; Inflatable Packer at 773'; pump: 777'; Air line: 770'.
6. **Picher # 7 (aka Picher-Cardin Well):** NW SE SW S20-T29N-R23E (N 36° 58' 28.2'' W 94° 50' 38.3''); Stand-By Well; Elevation: 814'; Total depth: 1100'; Casing Depth: 850'; Pump: 795'.
7. **Picher # 5:** SE SE NE S29-T29N-R23E (N 36° 57' 55.6'' W 94° 49' 54.7''); Public Water Supply Well; Elevation: 812'; Total depth: 1,100'; Casing Depth: 8'' @ 850'; Pump: 490'.
8. **RWD4 # 3 (aka Bluehole Well):** NE SE SW S30-T29N-R24E (N 36° 57' 38.7'' W 94° 44' 56.3''); Public Water Supply Well; Elevation: 831'; Total depth: 1100'; Casing Depth: 800'; Pump: 740'.
9. **Quapaw # 5:** SW SW NE S35-T29N-R23E (N 36° 57' 04.4'' W 94° 47' 07.3''); Monitoring Well; Elevation: 850'; Total depth: 1100'; Casing Depth: 8'' @ 850'; Pump: 795'.
10. **Quapaw # 4:** NW NW NW S1-T28N-R23E (N 36° 56' 33.4'' W 94° 47' 11.2''); Public Water Supply Well; Elevation: 845'; Total depth: 1,350'; Casing Depth: 620'; Pump: 608'.
11. **Fernandez Well:** SE NW NW S24-T29N-R23E (N 36° 59' 04.7'' W 94° 46' 20.3''); Domestic Drinking Water Well; Elevation: 850'; Total depth: 1050'; Casing Depth: 450'.
12. **Miami #11:** NW NW NW S16-T28N-R23E (N 36° 54' 46.6'' W 94° 50' 24.0''); Public Water Supply Well; Elevation: 832'; Total Depth: 1,110'; Casing Depth: 660'; Pump: 613'; al: 613'.
13. **RWD7 # 2:** NE SE SE S21-T29N-R22E (N 36° 58' 33.4'' W 94° 55' 16.6''); Public Water Supply Well; Elevation: 825'; Total depth: 1100'; Casing Depth: 8'' @ 800'; Pump: 740'.

Table 1 – Analytical Results for Tar Creek Long Term Monitoring of Roubidoux Wells

Analytical Data for Tar Creek Long Term Monitoring of Roubidoux Wells

WELL	DATE	Cond. (Field) uS/cm	Temp. (Field) °C	pH (Field)	D.O. (Field) mg/l	Alk (Field) CaCO ₃ mg/l	Alkalinity CaCO ₃ mg/l	Chloride Cl mg/l	Sulfate SO ₄ mg/l	Tot Dis Sol TDS mg/l	Hardness CaCO ₃ mg/l	Calcium Ca mg/l	Magnesium Mg mg/l	Sodium Na mg/l	Potassium K mg/l
								(250)	(250)	(500)					
MCL(SMCL)															
Roub. T.L. / Back.															
Cardin #1: SW SE SE 19-T29N-R23E; N 36 58 23.3, W 94 51 07.2, EL=817; TD=1150															
5 8 07	Totals	384	18.85	7.56	1.12	125	123	10	28.2	167	157	38.7	18.4	11.1	2.7
	Dissolved	-	-	-	-	-	-	-	-	-	-	32.2	15.6	9.1	2.3
11 8 06	Totals	634	21.79	7.2	1.32	160	147	28	156	375	293	64	29	15	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	60	28	15	3
4 11 06	Totals	368	18.8	7.28	5.32	111	137	13.5	78.8	238	201	43	20	11	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	43	20	11	3
10 17 05	Totals	487	19.2	7.8	0.9	127	144	20.8	107	308	262	60	27	13	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	69	29	13	3
4 25 05	Totals	510	18.3	7.56	1.58	177	144	21	111	347	260	59	27	14	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	58	26	13	3
10 12 04	Totals	498	18.3	7.62	1.82	199	140	20.4	107	333	250	59	27	14	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	56	26	13	3
4 27 04	Totals	334	19.6	7.43	3.48	150	138	14.5	93.3	319	231	50	24	12	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	50	24	12	3
11 6 03	Totals	595	17.6	6.47	n.a.	145	149	27.1	134	388	281	61	30	17	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	61	30	17	3
	Averages	476	19.1	7.37	2.22	149	140	19.4	101.9	309	242	54	25	13	3
Commerce #4: NW NE NW 6-T28N-R23E; N 36 56 31.9, W 94 52 21.1, EL=812; TD=1250															
x 5 8 07	Totals	710	20.03	7.37	3.6	136	148	75.3	125	432	291	71.9	30.9	43.1	3.4
	Dissolved	-	-	-	-	-	-	-	-	-	-	68.8	29.5	41.5	3.3
11 8 06	Totals	769	20.92	7.11	4.41	162	159	48.7	161	448	307	74	28	31	4
	Dissolved	-	-	-	-	-	-	-	-	-	-	66	28	30	4
4 11 06	Totals	412	20.1	8.41	3.54	164	161	56.5	166	437	311	70	29	36	4
	Dissolved	-	-	-	-	-	-	-	-	-	-	72	30	37	4
10 18 05	Totals	356	19.4	7.95	0.6	117	135	10	66	250	189	44	19	9	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	45	20	9	3
4 26 05	Totals	577	19.4	7.7	1.8	n.a.	135	60.5	76	342	214	49	22	34	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	48	21	34	3
10 12 04	Totals	614	19	7.47	1.61	183	148	43.5	126	403	270	65	27	29	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	63	26	29	3
4 27 04	Totals	403	18.7	7.75	3.39	218	144	59.5	107	409	252	54	24	35	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	56	25	35	3
11 6 03	Totals	615	17.9	6.42	n.a.	153	150	37.9	119	383	260	61	26	28	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	57	25	27	3
	Averages	557	19.4	7.52	2.71	162	148	49.0	118.3	388	262	60	26	30	3
Commerce #5 MW: NW SE NW 6-T28N-R23E; N 36 56 19.4, W 94 52 17.9, EL=812; TD=1100															
5 8 07	Totals	308	20.04	7.74	1.49	103	111	20	12.1	155	135	27.8	13.8	11.8	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	27.4	13.8	12	2.1
11 8 06	Totals	313	21.2	7.74	2.12	115	111	18	17.4	157	129	28	13	11	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	13	10	2
4 11 06	Totals	301	19.9	8.57	1.44	107	115	15.3	14.6	138	124	26	13	10	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	13	10	2
10 18 05	Totals	269	20.4	7.81	0.1	145	114	10.3	13.7	173	130	29	14	8	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	31	14	8	2
4 26 05	Totals	268	18.4	8.17	5.18	n.a.	115	10	13.9	150	121	28	13	8	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	13	8	2
10 12 04	Totals	260	17.9	8.64	5.65	152	111	10	13	154	124	28	13	8	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	13	8	2
4 27 04	Totals	252	18.9	7.82	5.75	158	111	10	11.8	158	122	25	13	8	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	25	13	8	2
4 27 04	Totals	252	18.9	7.82	5.75	158	111	10	11.8	158	123	25	13	8	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	13	8	2
11 6 03	Totals	294	17.7	7.29	n.a.	108	112	15.6	12	155	127	26	13	11	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	13	11	2
	Averages	280	19.3	7.96	3.44	131	112	13.2	13.4	155	126	27	13	9	2

WELL	DATE	Antimony Sb mg/l	Arsenic As mg/l	Cadmium Cd mg/l	Chromium Cr mg/l	Iron Fe mg/l	Lead Pb mg/l	Manganese Mn mg/l	Mercury Hg mg/l	Nickel Ni mg/l	Selenium Se mg/l	Thallium Tl mg/l	Zinc Zn mg/l	CAT / AN BALANCE % Error
MCL(SMCL)		0.006	0.01	0.005	0.1	(0.3)	0.015	0.05	0.002	0.1	0.05	0.002	(5)	
Roub. T.L. / Back.						.207/.062							.043/.009	

Cardin #1:

5 8 07	0.002	0.002	0.002	0.010	0.096	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	9.15
	0.002	0.002	0.002	0.010	0.076	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
11 8 06	0.002	0.002	0.002	0.010	0.103	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-5.01
	0.002	0.002	0.002	0.010	0.094	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
4 11 06	0.002	0.002	0.002	0.010	0.140	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-4.52
	0.002	0.002	0.002	0.010	0.121	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
10 17 05	0.002	0.002	0.002	0.010	0.170	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	1.44
	0.002	0.002	0.002	0.010	0.156	0.005	0.010	0.00005	0.010	0.010	0.001	0.006	
4 25 05	0.002	0.002	0.002	0.010	0.193	0.005	0.010	0.00005	0.010	0.010	0.001	0.036	0.61
	0.002	0.002	0.002	0.010	0.152	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
10 12 04	0.002	0.002	0.002	0.010	0.139	0.005	0.010	0.00005	0.010	0.010	0.001	0.009	2.19
	0.002	0.002	0.002	0.010	0.114	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
4 27 04	0.010	0.010	0.005	0.005	0.132	0.010	0.009	0.00005	0.010	0.010	0.010	0.033	-0.39
	0.010	0.010	0.005	0.005	0.112	0.010	0.009	0.00005	0.010	0.010	0.010	0.005	
11 6 03	0.002	0.002	0.002	0.010	0.101	0.005	0.010	0.00005	0.010	0.010	0.001	0.022	-1.58
	0.002	0.002	0.002	0.010	0.098	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	
	0.003	0.003	0.002	0.009	0.125	0.006	0.010	0.00005	0.010	0.010	0.002	0.010	0.24

Commerce #4:

x 5 8 07	0.002	0.002	0.002	0.010	0.151	0.005	0.010	0.00005	0.010	0.010	0.001	0.028	2.59
	0.002	0.002	0.002	0.010	0.129	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
11 8 06	0.002	0.002	0.002	0.010	0.106	0.005	0.010	0.00005	0.010	0.010	0.001	0.015	-2.96
	0.002	0.002	0.002	0.010	0.103	0.005	0.010	0.00005	0.010	0.010	0.001	0.009	
4 11 06	0.002	0.002	0.002	0.010	0.079	0.005	0.010	0.00005	0.010	0.010	0.001	0.027	-4.55
	0.002	0.002	0.002	0.010	0.079	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
10 18 05	0.002	0.002	0.002	0.010	0.132	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-1.47
	0.002	0.002	0.002	0.010	0.104	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
4 26 05	0.002	0.002	0.002	0.010	0.077	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-1.48
	0.002	0.002	0.002	0.010	0.072	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
10 12 04	0.002	0.002	0.002	0.010	0.090	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-0.03
	0.002	0.002	0.002	0.010	0.086	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
4 27 04	0.010	0.010	0.005	0.005	0.087	0.010	0.009	0.00005	0.010	0.010	0.010	0.005	-3.94
	0.010	0.010	0.005	0.005	0.085	0.010	0.010	0.00005	0.010	0.010	0.010	0.005	
11 6 03	0.002	0.002	0.002	0.010	0.095	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	-0.50
	0.002	0.002	0.002	0.010	0.086	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	
	0.003	0.003	0.002	0.009	0.098	0.006	0.010	0.00005	0.010	0.010	0.002	0.009	-1.54

Commerce #5 MW:

5 8 07	0.002	0.002	0.002	0.010	0.042	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	0.87
	0.002	0.002	0.002	0.010	0.031	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
11 8 06	0.002	0.002	0.002	0.010	0.033	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-1.50
	0.002	0.002	0.002	0.010	0.028	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
4 11 06	0.002	0.002	0.002	0.010	0.038	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-3.06
	0.002	0.002	0.002	0.010	0.026	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
10 18 05	0.002	0.002	0.002	0.010	0.043	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	2.47
	0.002	0.002	0.002	0.010	0.023	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
4 26 05	0.002	0.002	0.002	0.010	0.070	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-0.05
	0.002	0.002	0.002	0.010	0.034	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
10 12 04	0.002	0.002	0.002	0.010	0.092	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	1.70
	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
4 27 04	0.010	0.010	0.005	0.005	0.093	0.010	0.010	0.00005	0.010	0.010	0.010	0.005	-0.53
	0.010	0.010	0.005	0.005	0.034	0.010	0.010	0.00005	0.010	0.010	0.010	0.005	
4 27 04	0.010	0.010	0.005	0.005	0.114	0.010	0.010	0.00005	0.010	0.010	0.010	0.005	-0.53
	0.010	0.010	0.005	0.005	0.039	0.010	0.010	0.00005	0.010	0.010	0.010	0.005	
11 6 03	0.002	0.002	0.002	0.010	0.080	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	-0.53
	0.002	0.002	0.002	0.010	0.048	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	
	0.004	0.004	0.003	0.009	0.049	0.006	0.010	0.00005	0.010	0.010	0.003	0.006	-0.13

WELL	DATE	Cond. (Field) uS/cm	Temp. (Field) °C	pH (Field)	D.O. (Field) mg/l	Alk (Field) CaCO ₃ mg/l	Alkalinity CaCO ₃ mg/l	Chloride Cl mg/l	Sulfate SO ₄ mg/l	Tot Dis Sol TDS mg/l	Hardness CaCO ₃ mg/l	Calcium Ca mg/l	Magnesium Mg mg/l	Sodium Na mg/l	Potassium K mg/l
MCL/(SMCL)								(250)	(250)	(500)					
Roub. T.L. / Back.									82/25						
Fernandez Well: SE NW NW 24-T29N-R23E; N 36 59 04.7, W 94 46 20.3, EL=852; TD=105f															
5 7 07	Totals	951	18.38	6.81	1.75	206	216	10.0	285	679	522	113	54	15	4
	Dissolved	-	-	-	-	-	-	-	-	-	-	106	51	14	4
11 8 06	Totals	378	18.8	7.3	1.06	132	126	10.0	57.2	206	184	41	18	6	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	36	18	6	2
4 10 06	Totals	239	17.8	6.69	1.43	153	155	10.0	130	306	262	25	13	5	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	14	5	2
10 17 05	Totals	404	17.1	7.59	2.5	155	151	10.0	125	348	274	61	29	8	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	68	30	8	2
4 25 05	Totals	402	15.8	7.27	1.4	180	136	10.0	72.5	241	199	44	21	7	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	43	21	7	2
1 28 05	Totals	756	12.1	7.03	2.63	n.a.	211	10.0	282	648	477	-	-	49	13
10 11 04	Totals	445	15.4	7.41	2.09	128	138	10.0	92.4	284	219	57	27	8	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	56	26	8	2
10 11 04	Totals	445	15.4	7.41	2.09	128	148	10.0	115	327	248	57	27	8	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	54	25	7	2
4 29 04	Totals	427	17.3	7.5	2.27	134	128	10.0	56.3	233	185	43	22	7	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	15	6	2
4 29 04	Totals	427	17.3	7.5	2.27	134	144	10.0	103	328	236	39	20	7	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	15	6	2
12 19 03	Totals	415	14.8	6.64	n.a.	125	147.0	10.0	85.5	274	213	46	23	8	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	46	24	8	2
11 4 03	Totals	252	17.1	7.83	n.a.	115	114.0	10.0	16.4	138	126	27	14	5	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	14	5	2
10 6 03	Totals	257	18.3	7.08	n.a.	130	98.9	10.0	14.0	148	124	26	14	5	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	14	5	2
10 6 03	Totals	257	18.3	7.08	n.a.	130	98.6	10.0	16.4	132	126	26	14	5	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	14	5	2
7 30 03	Dis Met	370	18.2	8.19	n.a.	na	145.0	11.1	126.0	368	na	60	29	8	2
	Averages	428	16.8	7.29	1.95	142	143.8	10.1	105.1	311	243	46	22	9	3
Miami #1: SW NE SW 30-T28N-R23E; N 36 52 30.9, W 94 52 23.4; EL=790; TD=123f															
4 27 04	Totals	413	19.6	8.27	3.3	120	112	78.8	12.6	265	133	29	14	47	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	14	45	2
11 4 03	Totals	500	15.7	7.15	n.a.	na	117.0	83.6	12.4	262	133	30	15	50	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	30	15	50	3
11 4 03	Totals	500	15.7	7.15	n.a.	na	116.0	84.5	12.5	264	135	29	14	49	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	30	15	50	3
	Averages	471	17.0	7.52	3.30	120	115	82.3	12.5	264	134	29	15	49	3
Miami #3: NE NW 31-T28N-R23E; N 36 52 10.28, W 94 52 23.82; EL=783; TD=125f															
5 8 07	Totals	523	19.5	7.35	0.49	108	116	87.5	11.5	266	144	29	13.8	53.7	2.90
	Dissolved	-	-	-	-	-	-	-	-	-	-	29	13.9	52.1	2.80
11 8 06	Totals	538	18.56	7.52	1.51	116	115	95.6	16.8	275	129	27	14	54	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	13	52	3
4 11 06	Totals	547	20.1	8.51	2.14	155	138	94.3	15.3	256	131	28	14	57	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	29	14	57	3
10 18 05	Totals	492	19.3	7.7	0.7	125	118	92.8	12.9	263	138	31	14	54	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	31	14	55	3
10 18 05	Totals	492	19.3	7.7	0.7	125	118	91.6	13.7	258	138	32	14	54	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	34	15	54	3
4 26 05	Totals	527	18.8	7.77	1.47	n.a.	116	96.8	14	282	131	30	14	56	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	29	14	57	3
4 26 05	Totals	527	18.8	7.77	1.47	n.a.	117	97.4	15.4	283	130	29	14	56	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	29	14	56	3
10 12 04	Totals	506	16.5	8.00	1.65	102	114	97.2	13.4	293	134	30	14	57	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	32	15	56	3
10 12 04	Totals	506	16.5	8.00	1.65	102	114	95.7	13.6	291	132	28	13	54	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	30	14	56	3
	Averages	518	18.6	7.81	1.31	119	118	94.3	14.1	274	134	30	14	55	3

WELL	DATE	Antimony Sb mg/l	Arsenic As mg/l	Cadmium Cd mg/l	Chromium Cr mg/l	Iron Fe mg/l	Lead Pb mg/l	Manganese Mn mg/l	Mercury Hg mg/l	Nickel Ni mg/l	Selenium Se mg/l	Thallium Tl mg/l	Zinc Zn mg/l	CAT / AN BALANCE % Error
MCL(SMCL)		0.006	0.01	0.005	0.1	(0.3)	0.015	0.05	0.002	0.1	0.05	0.002	(5)	
Roub. T.L. / Back.						.207/.062							.043/.009	
Fernandez Well:														
	5 7 07	0.002	0.002	0.002	0.010	0.681	0.005	0.012	0.00005	0.010	0.010	0.001	0.999	1.28
		0.002	0.002	0.002	0.010	0.477	0.005	0.010	0.00005	0.010	0.010	0.001	< 0.005	
	11 8 06	0.002	0.002	0.002	0.010	0.350	0.005	0.010	0.00005	0.010	0.010	0.001	0.273	-1.93
		0.002	0.002	0.002	0.010	0.334	0.005	0.010	0.00005	0.010	0.010	0.001	0.039	
	4 10 06	0.002	0.002	0.002	0.010	0.302	0.005	0.010	0.00005	0.010	0.010	0.001	0.090	-40.36
		0.002	0.002	0.002	0.010	0.277	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 17 05	0.002	0.002	0.002	0.010	0.393	0.005	0.010	0.00005	0.010	0.010	0.001	0.251	-0.61
		0.002	0.002	0.002	0.010	0.391	0.005	0.010	0.00005	0.010	0.010	0.001	0.140	
	4 25 05	0.002	0.002	0.002	0.010	0.630	0.005	0.011	0.00005	0.010	0.010	0.001	0.689	-2.61
		0.002	0.002	0.002	0.010	0.526	0.005	0.010	0.00005	0.010	0.010	0.001	0.321	
	1 28 05	na	na	0.002	0.005	0.512	0.005	0.013	na	na	na	na	1.200	na
	10 11 04	0.002	0.002	0.002	0.010	0.349	0.005	0.010	0.00005	0.010	0.010	0.001	0.244	4.82
		0.002	0.002	0.002	0.010	0.343	0.015	0.010	0.00005	0.010	0.010	0.001	0.148	
	10 11 04	0.002	0.002	0.002	0.010	0.358	0.005	0.010	0.00005	0.010	0.010	0.001	0.251	-1.52
		0.002	0.002	0.002	0.010	0.318	0.021	0.010	0.00005	0.010	0.010	0.001	0.169	
	4 29 04	0.010	0.010	0.005	0.005	0.359	0.010	0.006	0.00006	0.010	0.010	0.010	0.299	3.60
		0.010	0.010	0.005	0.005	0.238	0.012	0.005	0.00005	0.010	0.010	0.010	0.089	
	4 29 04	0.010	0.010	0.005	0.005	0.359	0.010	0.006	0.00005	0.010	0.010	0.010	0.228	-14.66
		0.010	0.010	0.005	0.005	0.249	0.010	0.005	0.00005	0.010	0.010	0.010	0.037	
	12 19 03	0.002	0.002	0.002	0.010	0.319	0.026	0.010	0.00005	0.010	0.010	0.001	0.236	-4.30
		0.002	0.002	0.002	0.010	0.464	0.005	0.010	0.00005	0.010	0.010	0.001	0.464	
	11 4 03	0.002	0.002	0.002	0.010	0.316	0.005	0.010	0.00005	0.010	0.010	0.001	0.083	-2.35
		0.002	0.002	0.002	0.010	0.246	0.013	0.010	0.00005	0.010	0.010	0.001	0.070	
	10 6 03	0.002	0.002	0.002	0.010	0.208	0.017	0.010	0.00005	0.010	0.010	0.001	0.050	3.20
		0.002	0.002	0.002	0.010	0.288	0.005	0.010	0.00005	0.010	0.010	0.001	0.067	
	10 6 03	0.002	0.002	0.002	0.010	0.287	0.005	0.010	0.00005	0.010	0.010	0.001	0.065	2.34
		0.002	0.002	0.002	0.010	0.224	0.008	0.010	0.00005	0.010	0.010	0.001	0.033	
	7 30 03	na	na	na	na	0.410	0.056	0.010	na	0.010	na	na	0.239	-0.46
		0.003	0.003	0.002	0.009	0.365	0.010	0.010	0.00005	0.010	0.010	0.002	0.242	-3.83
Miami #1:														
	4 27 04	0.010	0.010	0.005	0.005	1.130	0.010	0.012	0.00005	0.010	0.010	0.010	0.005	-0.03
		0.010	0.010	0.005	0.005	0.042	0.010	0.005	0.00005	0.010	0.010	0.010	0.005	
	11 4 03	0.002	0.002	0.002	0.010	0.372	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	0.29
		0.002	0.002	0.002	0.010	0.062	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	
	11 4 03	0.002	0.002	0.002	0.010	0.057	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	-1.58
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	
		0.005	0.005	0.003	0.008	0.281	0.007	0.010	0.0001	0.010	0.010	0.004	0.008	-0.44
Miami #3:														
	5 8 07	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-0.48
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	11 8 06	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-4.08
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 11 06	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-5.82
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 18 05	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-1.15
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 18 05	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-0.50
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 26 05	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-1.70
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 26 05	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-2.80
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 12 04	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-0.89
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 12 04	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-3.62
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-2.34

WELL	DATE		Cond. (Field) uS/cm	Temp. (Field) °C	pH (Field)	D.O. (Field) mg/l	Alk (Field) CaCO ₃ mg/l	Alkalinity CaCO ₃ mg/l	Chloride Cl mg/l	Sulfate SO ₄ mg/l	Tot Dis Sol TDS mg/l	Hardness CaCO ₃ mg/l	Calcium Ca mg/l	Magnesium Mg mg/l	Sodium Na mg/l	Potassium K mg/l
MCL/(SMCL)									(250)	(250)	(500)					
Roub. T.L. / Back.										82/25						
Miami #11:			NW NW NW 16-T28N-R23E; N 36 54 46.6, W 94 50 24.0; EL=830 (topo); TD=1110													
	5 8 07	Totals	345	19.1	7.73	1.30	104	108.0	33.2	11.8	168	128	24.9	13.0	24.2	1.60
		Dissolved	-	-	-	-	-	-	-	-	-	-	24.7	12.9	23.5	1.60
	5 8 07	Totals	345	19.1	7.73	1.30	104	109.0	34.4	11.4	171	127	25.2	13.0	24.3	1.60
		Dissolved	-	-	-	-	-	-	-	-	-	-	25.1	13.0	23.2	1.60
	x 11 8 06	Totals	353	19.4	7.74	1.24	111	108.0	35.9	15.6	178	117	22	12	22	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	22	12	22	2
	11 8 06	Totals	353	19.4	7.74	1.24	275	109.0	35.1	15.5	183	115	23	12	23	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	23	12	23	2
		Averages	349	19.3	7.74	1.27	149	109	34.7	13.6	175	122	24	12	23	2
Picher #5-MW:			SE SE NE 29-T29N-R23E; N 36 57 55.6, W 94 49 54.7; GL(topo)=815; TD=1100.													
	5 8 07	Totals	442	20.03	7.59	1.56	119	121	38.9	57.2	256	194	40.9	20.1	25.8	2.8
		Dissolved	-	-	-	-	-	-	-	-	-	-	37.4	18.7	23.5	2.9
	11 8 06	Totals	635	21.46	7.23	0.88	139	137	27.4	141	373	282	64	28	17	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	58	27	17	3
	4 11 06	Totals	483	23.9	8.51	2.68	157	127	34.4	68.3	243	189	39	19	21	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	41	20	21	3
	4 11 06	Totals	483	23.9	8.51	2.68	157	126	34.4	69.8	245	189	40	20	21	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	42	20	21	3
	10 17 05	Totals	544	21.8	7.81	0.3	124	135	27.1	119	332	264	60	27	18	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	71	30	18	3
	10 17 05	Totals	544	21.8	7.81	0.3	124	135	28.3	118	307	265	61	27	18	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	73	30	18	3
	4 25 05	Totals	581	18.5	7.56	2.91	132	138	25.4	132	373	273	61	28	17	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	62	28	17	3
	10 12 04	Totals	569	18.3	7.68	2.33	122	136	26.4	140	398	279	63	29	17	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	62	28	17	3
	4 27 04	Totals	536	20.7	7.33	3.19	142	134	28.3	126	384	253	55	26	19	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	55	27	18	3
	11 5 03	Totals	590	14	6.52	n.a.	na	140	25.6	135	381	278	61	29	18	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	59	28	18	3
		Averages	541	20.4	7.66	1.87	135	133	29.6	110.6	329	247	55	25	19	3
Picher #6 MW:			SE NW NW 21-T29N-R23E; N 36 59 00.7, W 94 49 38.7, EL=824 Topo; TD=1100													
	x 5 7 07	Totals	616	20.06	7.22	1.97	138	139	10	177	375	286	63.6	30.8	13.7	2.4
		Dissolved	-	-	-	-	-	-	-	-	-	-	63.7	30.8	14	2.4
	5 7 07	Totals	616	20.06	7.22	1.97	138	139	10	175	381	290	64	30.9	13.6	2.3
		Dissolved	-	-	-	-	-	-	-	-	-	-	63.4	30.4	13.8	2.3
	11 7 06	Totals	602	21.4	6.94	4.17	141	136	10	144	339	273	56	27	12	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	55	27	12	2
	4 10 06	Totals	511	20.3	8.11	2.62	134	139	10	142	315	258	56	26	13	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	59	27	13	2
	4 10 06	Totals	511	20.3	8.11	2.62	134	138	10	143	316	258	54	25	13	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	57	26	13	2
	10 27 05	Totals	453	17.8	7.73	3.79	125	136	10	125	313	249	58	26	12	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	59	26	12	2
	10 27 05	Totals	453	17.8	7.73	3.79	125	137	10	125	307	251	63	27	12	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	59	26	12	2
	4 25 05	Totals	510	18.6	7.77	3.24	n.a.	135	10	125	333	251	60	26	12	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	58	26	12	2
	4 25 05	Totals	510	18.6	7.77	3.24	n.a.	134	10	126	336	251	61	26	12	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	56	25	12	2
	10 11 04	Totals	553	19.1	7.44	2.06	193	147	10	170	417	303	71	30	13	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	71	30	13	2
	4 27 04	Totals	555	20.9	7.26	4.92	157	143	10	156	407	293	63	29	14	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	62	29	13	2
	12 9 03	Totals	537	18.2	6.83	n.a.	135	143	10	150	380	280	65	29	13	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	60	27	12	2
	12 9 03	Totals	537	18.2	6.83	n.a.	135	142	10	150	381	277	64	29	13	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	61	27	12	2
		Averages	536	19.3	7.46	3.13	141	139	10.0	146.8	354	271	61	28	13	2

WELL	DATE	Antimony Sb mg/l	Arsenic As mg/l	Cadmium Cd mg/l	Chromium Cr mg/l	Iron Fe mg/l	Lead Pb mg/l	Manganese Mn mg/l	Mercury Hg mg/l	Nickel Ni mg/l	Selenium Se mg/l	Thallium Tl mg/l	Zinc Zn mg/l	CAT / AN BALANCE % Error
MCL(SMCL)		0.006	0.01	0.005	0.1	(0.3)	0.015	0.05	0.002	0.1	0.05	0.002	(5)	
Roub. T.L. / Back.						.207/.062							.043/.009	
Miami #11:														
	5 8 07	0.002	0.002	0.002	0.010	0.065	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	0.98
		0.002	0.002	0.002	0.010	0.035	0.005	0.010	0.00015	0.010	0.010	0.001	0.005	
	5 8 07	0.002	0.002	0.002	0.010	0.055	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	0.58
		0.002	0.002	0.002	0.010	0.026	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	x 11 8 06	0.002	0.002	0.002	0.010	0.081	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-6.10
		0.002	0.002	0.002	0.010	0.058	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	11 8 06	0.002	0.002	0.002	0.010	0.080	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-4.55
		0.002	0.002	0.002	0.010	0.050	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
		0.002	0.002	0.002	0.010	0.056	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-2.27
Picher #5-MW:														
	5 8 07	0.002	0.002	0.002	0.010	0.116	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	1.91
		0.002	0.002	0.002	0.010	0.110	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	11 8 06	0.002	0.002	0.002	0.010	0.118	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-1.03
		0.002	0.002	0.002	0.010	0.108	0.005	0.010	0.00015	0.010	0.010	0.001	0.005	
	4 11 06	0.002	0.002	0.002	0.010	0.629	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-4.56
		0.002	0.002	0.002	0.010	0.112	0.005	0.010	0.00015	0.010	0.010	0.001	0.005	
	4 11 06	0.002	0.002	0.002	0.010	0.227	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-3.23
		0.002	0.002	0.002	0.010	0.100	0.005	0.010	0.00015	0.010	0.010	0.001	0.005	
	10 17 05	0.002	0.002	0.002	0.010	0.098	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	1.13
		0.002	0.002	0.002	0.010	0.046	0.005	0.010	0.00015	0.010	0.010	0.001	0.005	
	10 17 05	0.002	0.002	0.002	0.010	0.107	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	1.43
		0.002	0.002	0.002	0.010	0.043	0.005	0.010	0.00010	0.010	0.010	0.001	0.009	
	4 25 05	0.002	0.002	0.002	0.010	0.093	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-0.47
		0.002	0.002	0.002	0.010	0.061	0.005	0.010	0.00011	0.010	0.010	0.001	0.005	
	10 12 04	0.002	0.002	0.002	0.010	0.171	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-0.24
		0.002	0.002	0.002	0.010	0.151	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 27 04	0.010	0.010	0.005	0.005	0.433	0.010	0.007	0.00005	0.010	0.010	0.010	0.005	-2.62
		0.010	0.010	0.005	0.005	0.390	0.010	0.007	0.00008	0.010	0.010	0.010	0.005	
	11 5 03	0.002	0.002	0.002	0.010	0.232	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	-0.32
		0.002	0.002	0.002	0.010	0.213	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	
		0.003	0.003	0.002	0.010	0.178	0.006	0.010	0.00008	0.010	0.010	0.002	0.006	-0.80
Picher #6 MW:														
	x 5 7 07	0.002	0.002	0.002	0.010	0.325	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-2.89
		0.002	0.002	0.002	0.010	0.302	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	5 7 07	0.002	0.002	0.002	0.010	0.327	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-2.41
		0.002	0.002	0.002	0.010	0.307	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	11 7 06	0.002	0.002	0.002	0.010	0.302	0.005	0.010	0.00005	0.010	0.010	0.001	0.008	-3.52
		0.002	0.002	0.002	0.010	0.274	0.005	0.010	0.00005	0.010	0.010	0.001	0.008	
	4 10 06	0.002	0.002	0.002	0.010	0.309	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-4.02
		0.002	0.002	0.002	0.010	0.284	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 10 06	0.002	0.002	0.002	0.010	0.301	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-5.69
		0.002	0.002	0.002	0.010	0.222	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 27 05	0.002	0.002	0.002	0.010	0.296	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	0.04
		0.002	0.002	0.002	0.010	0.238	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 27 05	0.002	0.002	0.002	0.010	0.298	0.005	0.010	0.00005	0.010	0.010	0.001	0.006	2.74
		0.002	0.002	0.002	0.010	0.282	0.005	0.010	0.00005	0.010	0.010	0.001	0.006	
	4 25 05	0.002	0.002	0.002	0.010	0.345	0.005	0.010	0.00005	0.010	0.010	0.001	0.006	1.11
		0.002	0.002	0.002	0.010	0.341	0.005	0.010	0.00005	0.010	0.010	0.001	0.007	
	4 25 05	0.002	0.002	0.002	0.010	0.338	0.005	0.010	0.00005	0.010	0.010	0.001	0.006	1.53
		0.002	0.002	0.002	0.010	0.331	0.005	0.010	0.00005	0.010	0.010	0.001	0.006	
	10 11 04	0.002	0.002	0.002	0.010	0.531	0.005	0.012	0.00005	0.010	0.010	0.001	0.021	-0.97
		0.002	0.002	0.002	0.010	0.507	0.005	0.012	0.00005	0.010	0.010	0.001	0.020	
	4 27 04	0.010	0.010	0.005	0.005	0.444	0.010	0.011	0.00005	0.010	0.010	0.010	0.015	-1.57
		0.010	0.010	0.005	0.005	0.414	0.010	0.011	0.00005	0.010	0.010	0.010	0.019	
	12 9 03	0.002	0.002	0.002	0.010	0.464	0.005	0.013	0.00005	0.010	0.010	0.001	0.016	-0.13
		0.002	0.002	0.002	0.010	0.337	0.005	0.010	0.00005	0.010	0.010	0.001	0.015	
	12 9 03	0.002	0.002	0.002	0.010	0.460	0.005	0.010	0.00005	0.010	0.010	0.001	0.014	-0.37
		0.002	0.002	0.002	0.010	0.337	0.005	0.010	0.00005	0.010	0.010	0.001	0.016	
		0.003	0.003	0.002	0.010	0.343	0.005	0.010	0.00005	0.010	0.010	0.002	0.009	-1.24

WELL	DATE	Cond. (Field) uS/cm	Temp. (Field) °C	pH (Field)	D.O. (Field) mg/l	Alk (Field) CaCO ₃ mg/l	Alkalinity CaCO ₃ mg/l	Chloride Cl mg/l	Sulfate SO ₄ mg/l	Tot Dis Sol TDS mg/l	Hardness CaCO ₃ mg/l	Calcium Ca mg/l	Magnesium Mg mg/l	Sodium Na mg/l	Potassium K mg/l
								(250)	(250)	(500)					
Roub. T.L. / Back.															
Picher #7 MW: aka: PICHER - CARDIN MW; NW SE SW 20-T29N-R23E; N 36 58 28.2, W 94 50 38.3, EL=815; TD=110f															
5 8 07	Totals	647	19.65	7.41	1.14	148	146	11.8	198	405	307	67.5	34.3	12.2	2.9
	Dissolved	-	-	-	-	-	-	-	-	-	-	66.9	34.5	11.9	2.8
11 7 06	Totals	652	19.81	7.04	2.04	153	146	12.3	175	397	329	65	33	12	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	60	31	11	3
4 11 06	Totals	482	19.6	8.2	1.43	117	129	17.5	103	257	216	44	23	13	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	47	23	13	3
10 17 05	Totals	527	20.4	7.82	0.2	179	142	11.4	137	326	280	62	30	11	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	72	32	11	3
4 25 05	Totals	524	18.3	7.71	1.87	174	140	10.1	125	341	261	59	28	11	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	56	28	11	3
10 12 04	Totals	483	17.9	7.83	1.31	129	136	13.5	112	306	244	54	26	12	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	55	27	12	3
4 27 04	Totals	480	20.2	7.5	4.35	105	134	12.6	112	335	237	51	26	12	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	49	26	12	3
11 5 03	Totals	563	14.7	6.89	n.a.	na	145	10	141	374	284	60	31	12	3
	Dissolved	-	-	-	-	-	-	-	-	-	-	59	31	12	3
	Averages	545	18.8	7.55	1.76	144	140	12.4	137.9	343	270	58	29	12	3
Quapaw #4: NW NW NW 1-T28N-R23E; N 36 56 33.4, W 94 47 11.2, EL(Topo)=845; TD=135f															
5 9 07	Totals	287	19.85	7.28	1.12	104	107	13.4	12.6	145	132	26.2	13.7	9.0	1.70
	Dissolved	-	-	-	-	-	-	-	-	-	-	26.6	13.4	8.6	1.60
11 9 06	Totals	276	19.12	7.39	0.52	118	112	18.6	20	160	134	29	14	12	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	13	11	2
4 12 06	Totals	270	18.8	8.53	1.03	92	109	10	15.2	118	118	24	13	5	1
	Dissolved	-	-	-	-	-	-	-	-	-	-	25	13	5	1
10 18 05	Totals	258	19.9	7.96	1.58	96	115	18.6	16.4	184	136	30	14	11	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	30	14	11	2
4 26 05	Totals	261	16.8	8.04	1.57	n.a.	109	10	13.5	138	119	26	13	6	1
	Dissolved	-	-	-	-	-	-	-	-	-	-	25	13	6	1
10 13 04	Totals	242	17.4	7.86	1.43	124	104	10	12.7	149	121	27	14	5	1
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	13	5	1
10 13 04	Totals	242	17.4	7.86	1.43	124	104	10	12.8	147	121	27	13	5	1
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	14	5	1
4 28 04	Totals	275	19.4	7.31	2.29	146	107	10	11.8	152	122	25	13	8	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	24	13	7	2
11 6 03	Totals	249	17.7	7.03	n.a.	107	109	10	11.1	129	120	25	13	5	1
	Dissolved	-	-	-	-	-	-	-	-	-	-	24	13	5	1
11 6 03	Totals	249	17.7	7.03	n.a.	107	109	10	11.1	131	121	24	13	5	1
	Dissolved	-	-	-	-	-	-	-	-	-	-	25	13	5	1
	Averages	261	18.4	7.63	1.37	113	109	12.1	13.7	145	124	26	13	7	1
Quapaw #5 MW: SW SW NE 35-T29N-R23E; N 36 57 04.4, W 94 47 07.3, EL=850 Topo; TD=110f															
5 9 07	Totals	1477	20.6	6.7	1.46	264	253	92.9	264	1000	716	154	75	54.2	8.6
	Dissolved	-	-	-	-	-	-	-	-	-	-	154	74	53.5	8.4
11 9 06	Totals	1446	19.93	6.78	1.39	272	251	95.4	391	968	709	156	69	50	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	143	69	49	8
4 12 06	Totals	1497	20.3	7.7	1.29	244	252	93.6	434	992	767	151	69	54	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	150	68	53	8
4 12 06	Totals	1497	20.3	7.7	1.29	244	253	93.8	422	993	764	150	69	54	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	147	67	53	8
10 18 05	Totals	1378	20.8	7.11	3.8	308	249	95.1	417	1020	358	162	72	53	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	168	73	50	7
4 26 05	Totals	1350	19.2	7.1	1.93	n.a.	246	92.4	412	1020	733	159	72	52	7
	Dissolved	-	-	-	-	-	-	-	-	-	-	152	68	51	7
10 13 04	Totals	1341	18.6	7.01	2.43	247	250	95.9	410	1010	739	159	70	53	7
	Dissolved	-	-	-	-	-	-	-	-	-	-	144	65	48	7
4 28 04	Totals	1372	21.7	6.87	1.75	260	254	104	455	1083	754	148	71	59	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	147	72	58	7
11 6 03	Totals	1427	18.5	6.41	n.a.	265	250	102	401	1050	751	146	70	58	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	147	71	59	8
	Averages	1421	20.0	7.04	1.92	263	251	96.1	400.7	1015	699	152	70	53	8

WELL	DATE	Antimony Sb mg/l	Arsenic As mg/l	Cadmium Cd mg/l	Chromium Cr mg/l	Iron Fe mg/l	Lead Pb mg/l	Manganese Mn mg/l	Mercury Hg mg/l	Nickel Ni mg/l	Selenium Se mg/l	Thallium Tl mg/l	Zinc Zn mg/l	CAT / AN BALANCE % Error
MCL(SMCL)		0.006	0.01	0.005	0.1	(0.3)	0.015	0.05	0.002	0.1	0.05	0.002	(5)	
Roub. T.L. / Back.						.207/.062							.043/.009	
Picher #7 MW:														
	5 8 07	0.002	0.002	0.002	0.010	0.079	0.005	0.006	0.00005	0.010	0.010	0.001	0.005	-4.07
		0.002	0.002	0.002	0.010	0.075	0.005	0.006	0.00005	0.010	0.010	0.001	0.005	
	11 7 06	0.002	0.002	0.002	0.010	0.124	0.005	0.006	0.00005	0.010	0.010	0.001	0.005	-2.60
		0.002	0.002	0.002	0.010	0.113	0.005	0.006	0.00005	0.010	0.010	0.001	0.005	
	4 11 06	0.002	0.002	0.002	0.010	0.079	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-4.88
		0.002	0.002	0.002	0.010	0.065	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 17 05	0.002	0.002	0.002	0.010	0.064	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	0.88
		0.002	0.002	0.002	0.010	0.062	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 25 05	0.002	0.002	0.002	0.010	0.090	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	1.03
		0.002	0.002	0.002	0.010	0.090	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 12 04	0.002	0.002	0.002	0.010	0.127	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	0.03
		0.002	0.002	0.002	0.010	0.121	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 27 04	0.010	0.010	0.005	0.005	0.078	0.010	0.005	0.00005	0.010	0.010	0.010	0.005	-0.76
		0.010	0.010	0.005	0.005	0.072	0.010	0.005	0.00005	0.010	0.010	0.010	0.005	
	11 5 03	0.002	0.002	0.002	0.010	0.166	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	0.24
		0.002	0.002	0.002	0.010	0.160	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	
		0.003	0.003	0.002	0.009	0.098	0.006	0.008	0.00005	0.010	0.010	0.002	0.006	-1.27
Quapaw #4:														
	5 9 07	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.043	1.62
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.041	
	11 9 06	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-0.10
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 12 06	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-5.03
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 18 05	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	0.23
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 26 05	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-1.62
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 13 04	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	2.20
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 13 04	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	0.64
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 28 04	0.010	0.010	0.005	0.005	0.020	0.010	0.005	0.00005	0.010	0.010	0.010	0.005	0.94
		0.010	0.010	0.005	0.005	0.020	0.010	0.005	0.00005	0.010	0.010	0.010	0.005	
	11 6 03	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	-2.49
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	
	11 6 03	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	-3.47
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	
		0.003	0.003	0.002	0.010	0.020	0.006	0.010	0.00005	0.010	0.010	0.002	0.010	-0.71
Quapaw #5 MW:														
	5 9 07	0.002	0.002	0.002	0.010	2.620	0.005	0.026	0.00005	0.010	0.010	0.001	0.121	11.02
		0.002	0.004	0.002	0.010	2.450	0.005	0.010	0.00005	0.010	0.010	0.001	0.114	
	11 9 06	0.002	0.004	0.002	0.010	2.480	0.005	0.035	0.00005	0.010	0.010	0.001	0.113	-0.02
		0.002	0.004	0.002	0.010	2.420	0.005	0.035	0.00005	0.010	0.010	0.001	0.110	
	4 12 06	0.002	0.002	0.002	0.010	2.620	0.005	0.027	0.00005	0.010	0.010	0.001	0.118	-2.91
		0.002	0.005	0.002	0.010	2.570	0.005	0.037	0.00005	0.010	0.010	0.001	0.112	
	4 12 06	0.002	0.002	0.002	0.010	2.610	0.005	0.026	0.00005	0.010	0.010	0.001	0.119	-2.39
		0.002	0.002	0.002	0.010	2.530	0.005	0.037	0.00005	0.010	0.010	0.001	0.110	
	10 18 05	0.002	0.005	0.002	0.010	2.440	0.005	0.036	0.00005	0.010	0.010	0.001	0.139	0.55
		0.002	0.005	0.002	0.010	2.340	0.005	0.038	0.00005	0.010	0.010	0.001	0.143	
	4 26 05	0.002	0.005	0.002	0.010	2.860	0.005	0.039	0.00005	0.010	0.010	0.001	0.167	0.62
		0.002	0.005	0.002	0.010	2.680	0.005	0.039	0.00005	0.010	0.010	0.001	0.159	
	10 13 04	0.002	0.005	0.002	0.010	3.060	0.005	0.043	0.00005	0.010	0.010	0.001	0.178	-0.18
		0.002	0.005	0.002	0.010	2.750	0.005	0.042	0.00005	0.010	0.010	0.001	0.160	
	4 28 04	0.010	0.010	0.005	0.005	3.680	0.010	0.050	0.00005	0.010	0.010	0.010	0.208	-4.43
		0.010	0.011	0.005	0.005	3.580	0.010	0.049	0.00005	0.010	0.010	0.010	0.194	
	11 6 03	0.002	0.005	0.002	0.010	3.720	0.005	0.046	0.00005	0.010	0.010	0.001	0.222	-1.40
		0.002	0.005	0.002	0.010	3.690	0.005	0.047	0.00005	0.010	0.010	0.001	0.213	
		0.003	0.005	0.002	0.009	2.839	0.006	0.037	0.00005	0.010	0.010	0.002	0.150	0.10

WELL	DATE	Cond. (Field) uS/cm	Temp. (Field) °C	pH (Field)	D.O. (Field) mg/l	Alk (Field) CaCO ₃ mg/l	Alkalinity CaCO ₃ mg/l	Chloride Cl mg/l	Sulfate SO ₄ mg/l	Tot Dis Sol TDS mg/l	Hardness CaCO ₃ mg/l	Calcium Ca mg/l	Magnesium Mg mg/l	Sodium Na mg/l	Potassium K mg/l
MCL(SMCL)									(250)	(250)	(500)				
Roub. T.L. / Back.									(250)	(250)	(500)				
RWD4 #3		(aka: Blue hole Well): NE SE SW 30-T29N-R24E; N 36 57 38.7, W 94 44 56.3, EL(Topo)=900; TD=110													
x 5 9 07	Totals	298	19.75	7.52	0.93	125	110	17.8	10	151	141	26.8	15.1	7.2	1.50
	Dissolved	-	-	-	-	-	-	-	-	-	-	26.6	15.0	7.1	1.60
5 9 07	Totals	298	19.75	7.52	0.93	125	110	17.7	10	147	143	26.5	15.0	7.0	1.50
	Dissolved	-	-	-	-	-	-	-	-	-	-	26.6	15.0	7.1	1.60
11 9 06	Totals	299	20.28	7.69	1.25	116	111	18.1	11	160	135	27	15	7	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	15	7	2
4 2 06	Totals	309	19.4	7.98	0.86	99	114	17.9	10.5	134	130	25	15	7	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	15	7	2
10 18 05	Totals	295	20.4	8.09	1.05	141	114	17.7	10.4	168	140	29	16	7	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	15	6	2
4 26 05	Totals	282	18.4	8.01	1.91	n.a.	114	16.5	10.2	157	133	28	15	6	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	15	6	2
10 13 04	Totals	275	18.9	7.97	2.3	157	109	16.6	10.2	154	132	29	16	7	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	15	6	2
4 28 04	Totals	273	19.9	7.42	3.34	124	110	15.2	10.0	160	135	26	15	6	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	15	6	2
4 28 04	Totals	273	19.9	7.42	3.34	124	110	15.2	10.0	159	132	25	15	6	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	15	6	2
11 7 03	Totals	283	17.7	6.65	n.a.	110	114	14.8	10.0	133	135	27	15	6	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	15	6	2
11 7 03	Totals	283	17.7	6.65	n.a.	110	114	14.6	10.0	136	134	27	16	6	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	16	6	2
	Averages	288	19.3	7.54	1.77	123	112	16.6	10.2	151	135	27	15	6	2
RWD7 #1:		NE SE SE 21-T29N-R23E; N 36 58 33.4 , W 94 55 16.6; EL=825; TD=1100													
5 9 07	Totals	1181	22.4	7.62	1.41	143	139.0	272.0	13.0	573	170	35.3	17.4	184.0	6.20
	Dissolved	-	-	-	-	-	-	-	-	-	-	34.6	17.5	182.0	6.00
x 11 9 06	Totals	1446	19.9	6.78	1.39	270	139.0	286.0	18.6	606	159	37	16	172	6
	Dissolved	-	-	-	-	-	-	-	-	-	-	32	16	164	5
11 9 06	Totals	1446	19.9	6.78	1.39	275	140.0	287.0	18.8	598	160	36	16	171	6
	Dissolved	-	-	-	-	-	-	-	-	-	-	33	16	167	6
	Averages	1358	20.8	7.06	1.40	229	139	281.7	16.8	592	163	35	16	173	6

NOTE: 1) Detection limits used in calculation of means; 2) total and dissolved metals concentrations used in calculation of means; 3) means are in italics type
4) Duplicate samples are highlighted with asterisk near date of sample; 5) a box indicates an MCL or SMCL violation; 6) shaded box is a Roubidoux background val
7) underline indicates a value detected in blank; 8) na indicates not analyzed; 9) dash indicates not relevant; 10) Bold type indicates value Tolerance Limi
11) Indicator parameters of mine water contamination with tolerance limits and Roubidoux background concentration: **Sulfate** (82 25 mg l); **Iron** (207 61.5 ug l); **Zinc** (43 8.8 ug l).
x - denotes location of Blank sample;

WELL	DATE	Antimony Sb mg/l	Arsenic As mg/l	Cadmium Cd mg/l	Chromium Cr mg/l	Iron Fe mg/l	Lead Pb mg/l	Manganese Mn mg/l	Mercury Hg mg/l	Nickel Ni mg/l	Selenium Se mg/l	Thallium Tl mg/l	Zinc Zn mg/l	CAT / AN BALANCE % Error
MCL(SMCL)		0.006	0.01	0.005	0.1	(0.3)	0.015	0.05	0.002	0.1	0.05	0.002	(5)	
Roub. T.L. / Back.						.207/.062							.043/.009	
RWD4 #3														
x	5 9 07	0.002	0.002	0.002	0.010	0.024	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	0.40
		0.002	0.002	0.002	0.010	0.021	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	5 9 07	0.002	0.002	0.002	0.010	0.022	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-0.10
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	11 9 06	0.002	0.002	0.002	0.010	0.025	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-0.34
		0.002	0.002	0.002	0.010	0.022	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 2 06	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-2.81
		0.002	0.002	0.002	0.010	0.022	0.005	0.015	0.00005	0.010	0.010	0.001	0.005	
	10 18 05	0.002	0.002	0.002	0.010	0.025	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	2.06
		0.002	0.002	0.002	0.010	0.022	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 26 05	0.002	0.002	0.002	0.010	0.031	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-0.20
		0.002	0.002	0.002	0.010	0.026	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	10 13 04	0.002	0.002	0.002	0.010	0.026	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	4.36
		0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	4 28 04	0.010	0.010	0.005	0.005	0.026	0.010	0.005	0.00005	0.010	0.010	0.010	0.005	0.16
		0.010	0.010	0.005	0.005	0.027	0.010	0.005	0.00005	0.010	0.010	0.010	0.005	
	4 28 04	0.010	0.010	0.005	0.005	0.025	0.010	0.005	0.00005	0.010	0.010	0.010	0.005	-0.72
		0.010	0.010	0.005	0.005	0.029	0.010	0.005	0.00005	0.010	0.010	0.010	0.005	
	11 7 03	0.002	0.002	0.002	0.010	0.044	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	-0.17
		0.002	0.002	0.002	0.010	0.038	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	
	11 7 03	0.002	0.002	0.002	0.010	0.045	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	1.33
		0.002	0.002	0.002	0.010	0.038	0.005	0.010	0.00005	0.010	0.010	0.001	0.010	
		<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.009</i>	<i>0.027</i>	<i>0.006</i>	<i>0.009</i>	<i>0.00005</i>	<i>0.010</i>	<i>0.010</i>	<i>0.003</i>	<i>0.006</i>	<i>0.36</i>
RWD7 #1:														
	5 9 07	0.002	0.002	0.002	0.010	0.118	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	2.88
		0.002	0.002	0.002	0.010	0.095	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
x	11 9 06	0.002	0.002	0.002	0.010	0.087	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-1.97
		0.002	0.002	0.002	0.010	0.076	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
	11 9 06	0.002	0.002	0.002	0.010	0.090	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-2.64
		0.002	0.002	0.002	0.010	0.075	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	
		<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.010</i>	<i>0.090</i>	<i>0.005</i>	<i>0.010</i>	<i>0.00005</i>	<i>0.010</i>	<i>0.010</i>	<i>0.001</i>	<i>0.005</i>	<i>-0.58</i>

NOTE:

- 1) Detection limits used in calculation of means; 2) total and dissolved metals concentrations used in calculation of means; 3) means are in italics type
- 4) Duplicate samples are highlighted with asterisk near date of sample; 5) a box indicates an MCL or SMCL violation; 6) shaded box is a Roubidoux background val
- 7) underline indicates a value detected in blank; 8) na indicates not analyzed; 9) dash indicates not relevant; 10) Bold type indicates value Tolerance Limi
- 11) Indicator parameters of mine water contamination with tolerance limits and Roubidoux background concentration: **Sulfate** (82 25 mg l); **Iron** (207 61.5 ug l); **Zinc** (43 8.8 ug l).
- indicates no blank for that day's samples