

8/31/2015

...

R. Mark Owens
SteelCats, LLC

Mr. Andrew Persinko, Deputy Director
Decom and Uranium Recovery Licensing Directorate
Division of Waste Mgmt and Env Protection,
Office of Federal and State Materials and Environmental Management Programs
Mail Stop T8-F5
U.S. Nuclear Regulatory Commission
11545 Rockville, MD 20852-2738

Ref: Docket No. 40-2259, Source Material License No. SUA-672
Groundwater Semi-Annual Report

Dear Mr. Persinko,

On Behalf of AREVA, enclosed please find two copies of the semi-annual ground water monitoring report covering the first and second quarters of 2015 as required by condition 60B of the referenced license. Please let me know if there are any questions regarding the report.

Sincerely,



R. Mark Owens
Consultant for AREVA, Inc.

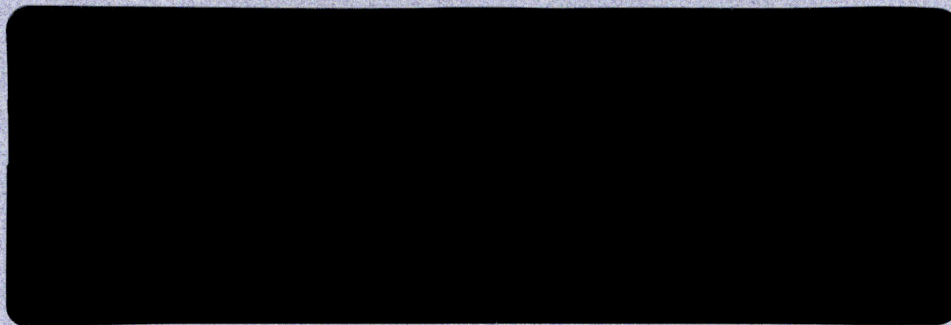
Enclosure

Cc: D. B. Spitzberg, USNRC Region IV
Cc: Document Control
Cc: Rodney Bradley, AREVA

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SteelCats, LLC
567 Long Lane, Casper, WY 82609
Tel: 307 262 1851 Email: rmowens54@gmail.com

NM5501



HYDRO - ENGINEERING, LLC

**SEMI-ANNUAL
GROUND-WATER MONITORING
FOR LUCKY Mc MINE**

PREPARED FOR:

**AREVA
LUCKY Mc MINE**

BY:

HYDRO-ENGINEERING, L.L.C.

AUGUST, 2015

Brandon Weaver
BRANDON WEAVER

George L. Hoffman
**GEORGE L. HOFFMAN, P.E.
HYDROLOGIST**

8/24/2015

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1.0 Introduction and Summary of Results

This semi-annual report presents the results of ground-water monitoring for the first half of 2015 for the Lucky Mc tailings area. This report covers the requirement of NRC License SUA-672, License Condition 60B.

The following table lists the site standards that are in effect at Lucky Mc tailings POC well T1-12. The tabulation also lists the measured June 2015 concentrations for POC well T1-12. All of the present concentrations in POC well T1-12 are significantly below the site standards except for Ra226 + Ra228 which is below the site standard.

GROUND-WATER PROTECTION STANDARDS FOR POINT-OF-COMPLIANCE WELL T1-12 AND JUNE 2015 POC CONCENTRATION									
POC STANDARD & CONCENTRATION	CONSTITUENT								
	Arsenic	Beryllium	Cadmium	Chromium	Nickel	RA- 226+Ra- 228	Selenium	Thorium- 230	Uranium
SITE STANDARD	0.05	0.07	0.02	0.05	0.85	7.5	1.1	13.2	1.7
T1-12, JUNE 2015	0.004	<0.001	<0.001	<0.01	0.25	5.7	0.176	0.4	0.379

NOTE: All concentrations in mg/l except for radium and thorium in pCi/l.

Figure 1.3-2 in the Lucky Mc ACL report shows the base of the Lucky Mc aquifer which shows that a narrow outlet exists on the east side of the No. 1 and No. 2 Tailings connecting them to the Wind River Channel. The No. 1 and the No. 2 Tailings should not be presently contributing any seepage to the Wind River Channel and the Fraser Draw alluvium because the water levels in these tailings are below the base of the aquifer. Figures 1.3-4 (see channel close to the B side of the cross section) and 1.3-5 (see the ridge near well OBS-2) in the Lucky Mc ACL report show that the outlets to the No. 2 and No. 1 Tailings were dry or essentially dry in 2000. Therefore these tailings should not be contributing any additional source to the Lucky Mc aquifer with time. Stable concentrations in POC well T1-12 support this conclusion.

Modeling of key parameters, uranium, selenium and radium-226 + 228 are presented in the Lucky Mc ACL report. The following table presents a comparison between the model predictions and the 2015 observed concentrations for POC well T1-12 and wells AL-1 and AL-6. These comparisons show that the present concentrations agree fairly well with the model predictions for 2015, except for Ra-226 + Ra-228 values which appear to be outliers from a possible lab error. Concentrations at the POC well are not expected to ever exceed the site standards based on the present levels and the model predictions.

COMPARISON OF MODEL PREDICTION AND 2015 CONCENTRATIONS									
CONSTITUENT	URANIUM			SELENIUM			RA-226 + RA-228		
WELL	T1-12	AL-1	AL-6	T1-12	AL-1	AL-6	T1-12	AL-1	AL-6
MODEL PREDICTIONS	0.6	1.1	1.1	0.2	0.4	0.3	7	1	1
2015 CONCENTRATIONS	0.379	1.37	0.726	0.176	0.293	0.139	5.7	8	4.4

NOTE: All concentrations in mg/l except for radium in pCi/l.

2.0 Piezometric Data

The water-level data collected during the second quarter of 2015 are presented in Table 1 along with the 2012 through 2015 water-level data. Figure 1 presents the piezometric surface of the Lucky Mc aquifer from the POC well through the Fraser Draw alluvium, while Figure 2 presents plots of the water-level elevations versus time for wells AL-6, T1-6, T1-12, AL-1 and AL-7. The corresponding water-level elevation or constituent concentration is posted adjacent to the well location on the plan view figures of the area (such as Figure 1). Water-level elevations through the second quarter of 2015 were fairly steady.

3.0 Water-Quality Data

License Condition 60B requires monitoring of water from the POC and POE wells and other selected wells for the constituents presented in Table 1. An analysis of the selenium, uranium, combined radium-226 plus radium-228, sulfate, chloride and TDS concentrations is required.

Figure 3 presents the June 2015 chloride concentrations for the Lucky Mc aquifer. The chloride concentrations are highest in the Fraser Draw alluvial well AL-1 and Wind River Channel at POC well T1-12 and decrease significantly to levels similar to background levels at well AL-7. The chloride concentration in well AL-1 is higher showing the concentration gradient from the east to the west. Chloride concentration in well AL-1 have been steady in the past two years. Figure 4 presents the plots of chloride concentration versus time for the five monitored wells. Chloride concentrations in POC well T1-12 overall have been fairly steady in 2012 through 2015 while a gradual increase was observed in POE well AL-6 and well AL-7. The decrease in the chloride and sulfate concentrations in June 2015 in well T1-12 needs to be confirmed prior to giving it any significance. A larger increase was observed in the last half of 2010 and 2011 in well AL-1.

Figure 5 presents the TDS concentrations for June 2015 water samples from the Lucky Mc aquifer. The TDS concentrations are greater than 5000 mg/l at POC well T1-12, slightly less in Fraser Draw alluvial well AL-1 and are less than 4000 mg/l in the western portion of the Fraser Draw alluvium at well AL-7. Figure 6 presents the plots of TDS concentrations versus time and illustrates that the 2015 TDS concentrations are similar to the average value for the previous few years for well T1-12. An increase in concentrations in 2011 and 2012 was observed in well AL-1 but concentrations have declined to fairly steady levels since 2014. A gradual increase in TDS had been observed in well AL-7 and AL-6 in recent years but has been steady the last year. This change is likely due to the concentration gradient shifting.

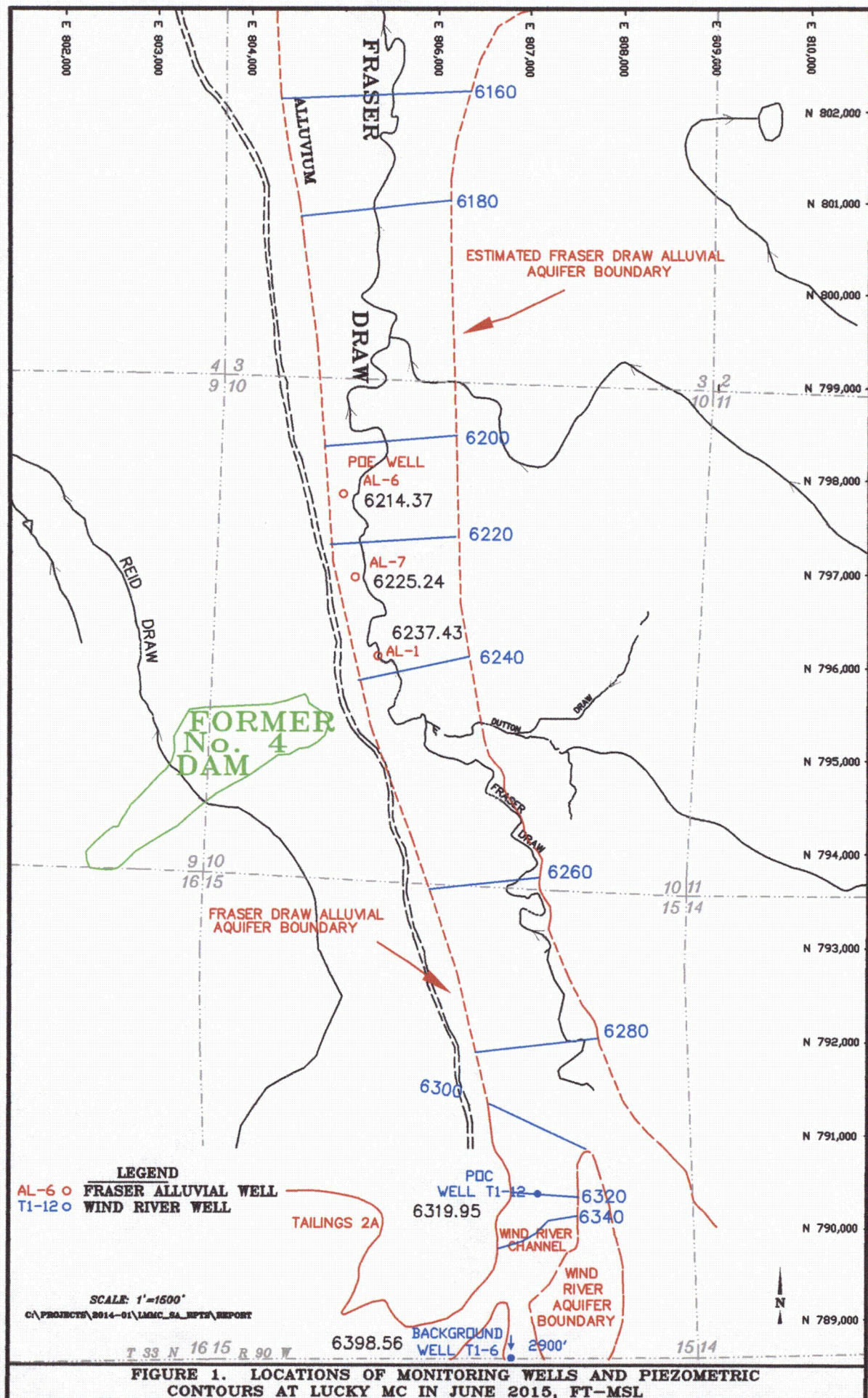
The measured sulfate concentrations for the Lucky Mc aquifer during June of 2015 are presented in Figure 7 and show that the sulfate concentrations in the western portion of the Fraser Draw alluvium are greater than 2000 mg/l near well AL-1 while concentrations are less than 2000 mg/l in the eastern half. The sulfate concentration versus time plots in Figure 8 show that sulfate concentrations in POC well T1-12 have overall been steady for the last six years but significantly declined in the second quarter of 2015. The increase in sulfate in the 2nd half of 2010 and 2011 in well AL-1 shows the effect of the shift in concentrations to the east. An overall decline in sulfate concentrations was observed in well AL-1 in 2012 through the first half of 2015.

Uranium concentrations for the Lucky Mc aquifer during June of 2015 are presented in Figure 9, and this figure shows the highest observed uranium concentrations at well AL-1. Figure 10 shows that the uranium concentration in the POE well had overall gradually increased but gradually declined in 2014 and 2015. A larger increase had been observed in well AL-1 in 2010 and 2011 with an overall decline in uranium concentrations until the fourth quarter of 2013. Values have been fairly steady since. The uranium concentrations have been relatively steady in POC well T1-12 for the last few years.

Figure 11 presents the selenium concentrations for June 2015 for the Lucky Mc aquifer. Selenium concentrations were greatest at POC well T1-12 and have overall gradually declined for the last few years (see Figure 12). The selenium concentration in well AL-1 have increased the last five years to a level higher than the value in well T1-12 which could be due to alluvial water shifting to the east in this area. Values have been fairly steady through the first half of 2015 in well AL-1.

Figure 13 presents the radium-226 plus radium-228 activity for June 2015 in the Lucky Mc aquifer in pCi/l. The activity at POC well T1-12 has remained well below the radium-226 plus radium-228 site standard of 7.5 pCi/l until the first quarter of 2015 when it was 13.0 pCi/l. A similar jump in Ra226 + Ra228 concentrations was observed in all of the wells at the Lucky Mc Mine and appears to be a laboratory error. Measured radium activities generally exhibit more variability than other constituents, and little significance is given to occasional outliers. Figure 14 shows plots of the radium-226 plus radium-228 activity versus time for the monitored wells. These plots show significant variability in measured activity, especially since the fourth quarter of 2014, which is thought to be due to variability in the laboratory analysis. Previous recent values for well AL-6 had been near 6 pCi/l recent values have been more variable. These higher radium levels are not supported by increases in other parameters and should not be given any significance at this time. The radium-226 plus radium-228 activity in upgradient well T1-6 also recently increased.

Concentrations of the remainder of the constituents at the site are gradually decreasing or are not significant at POC well T1-12.



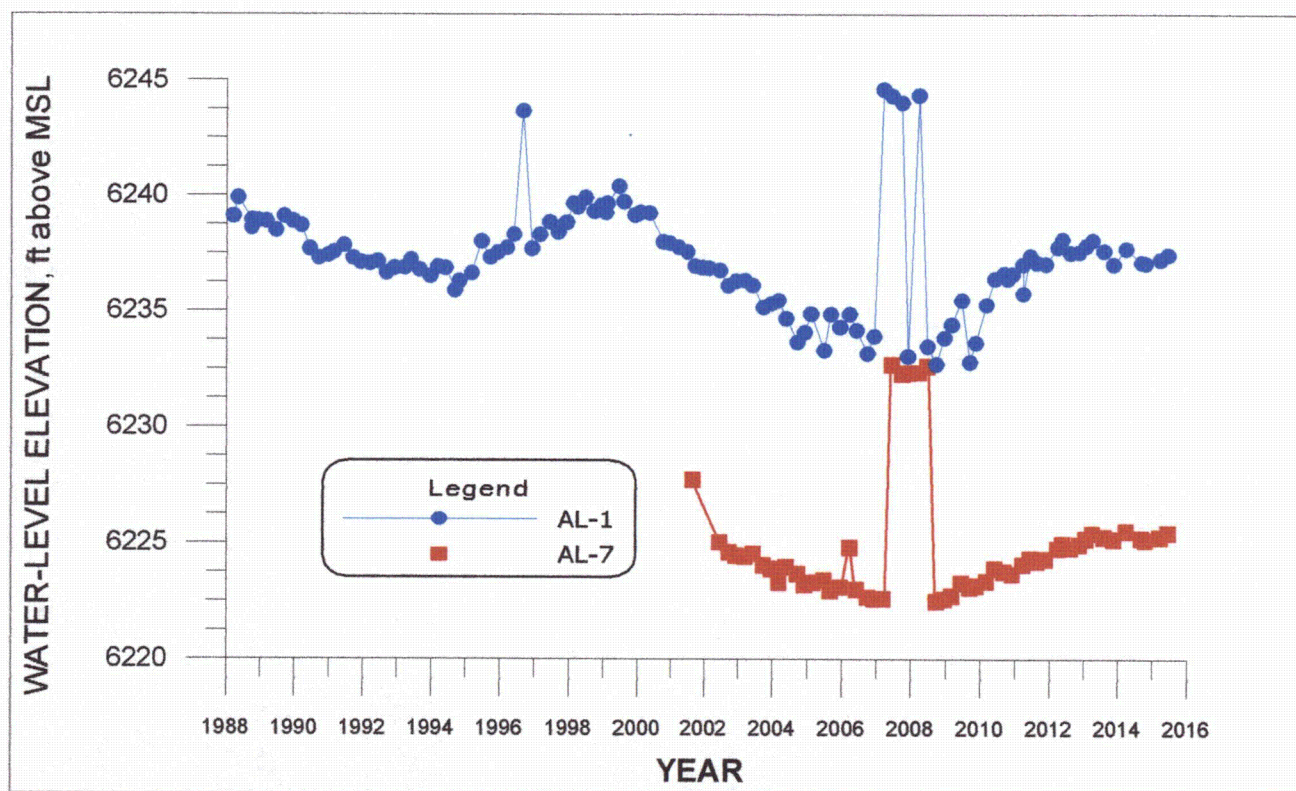
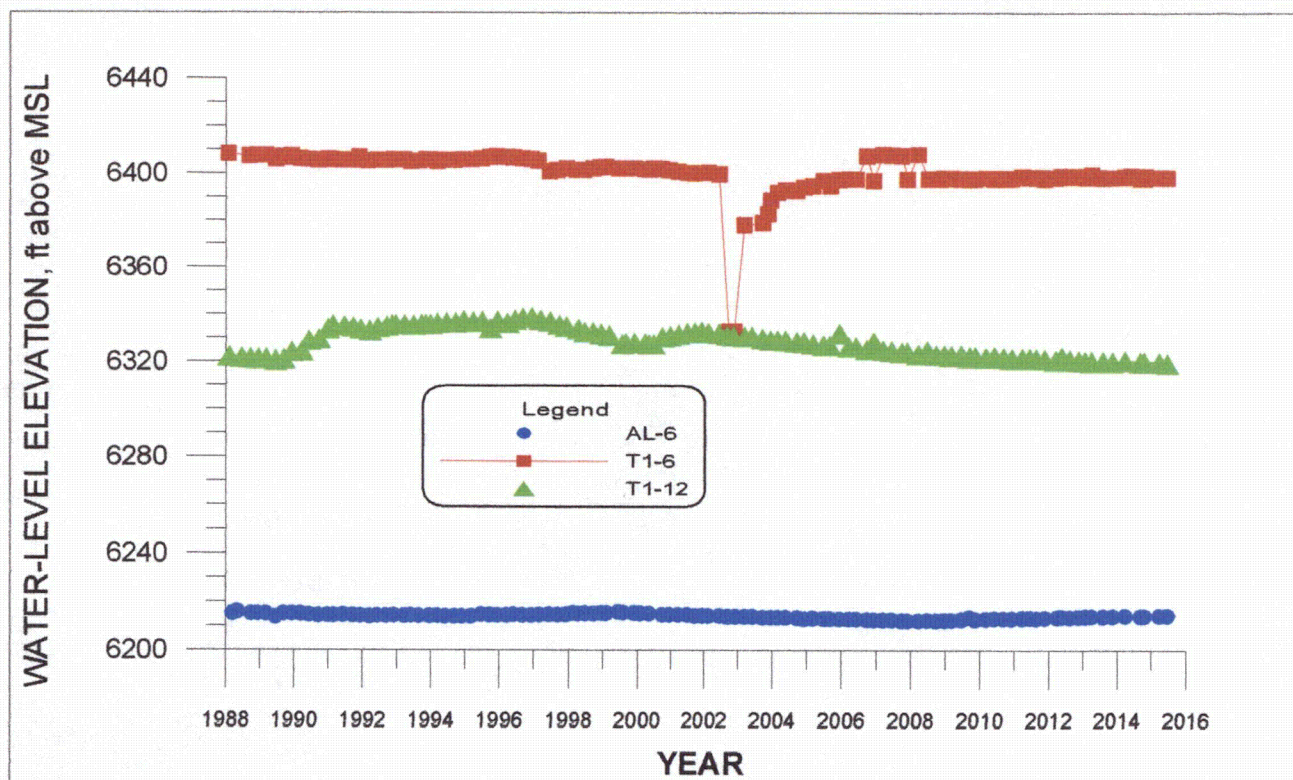
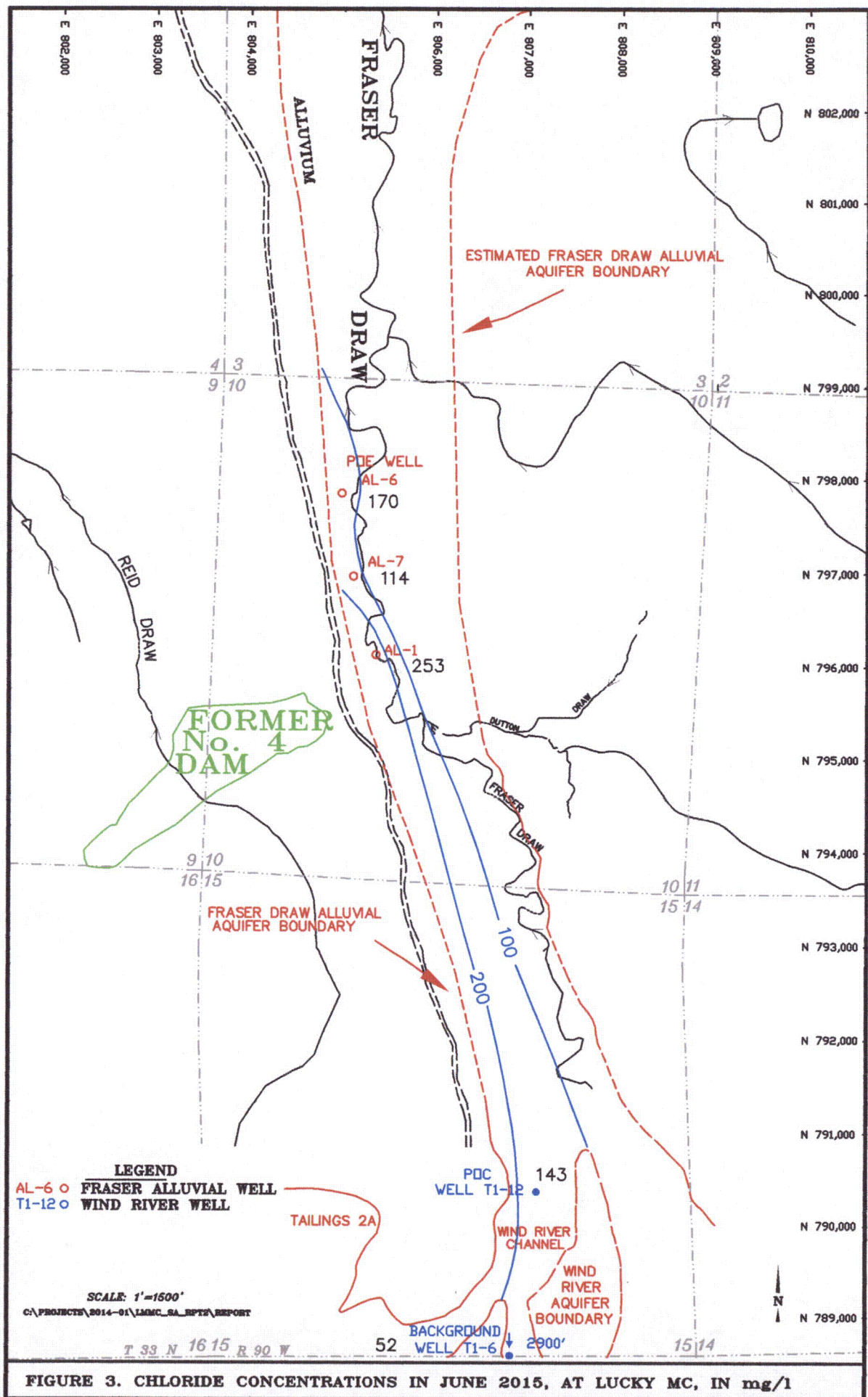


FIGURE 2. WATER-LEVEL ELEVATION VERSUS TIME FOR WELLS T1-6, T1-12, AL-1, AL-6 AND AL-7.



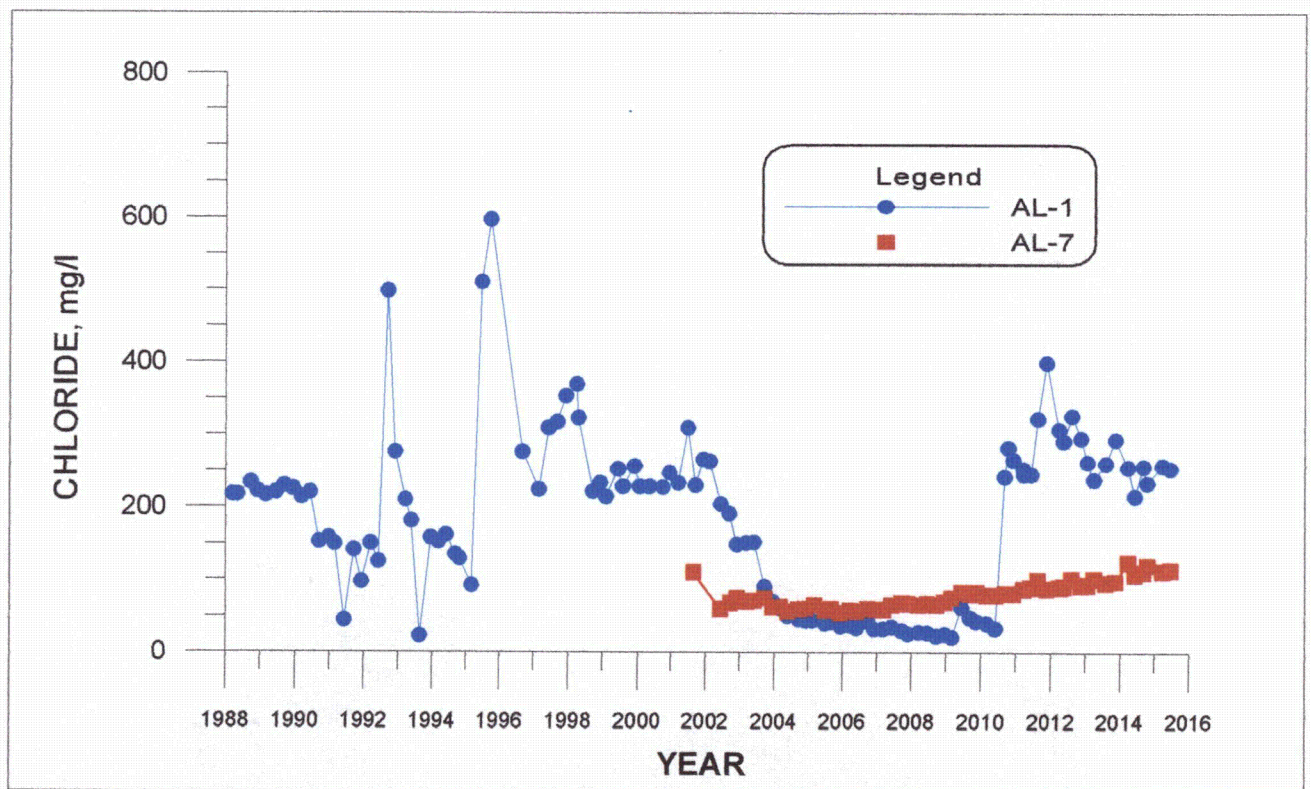
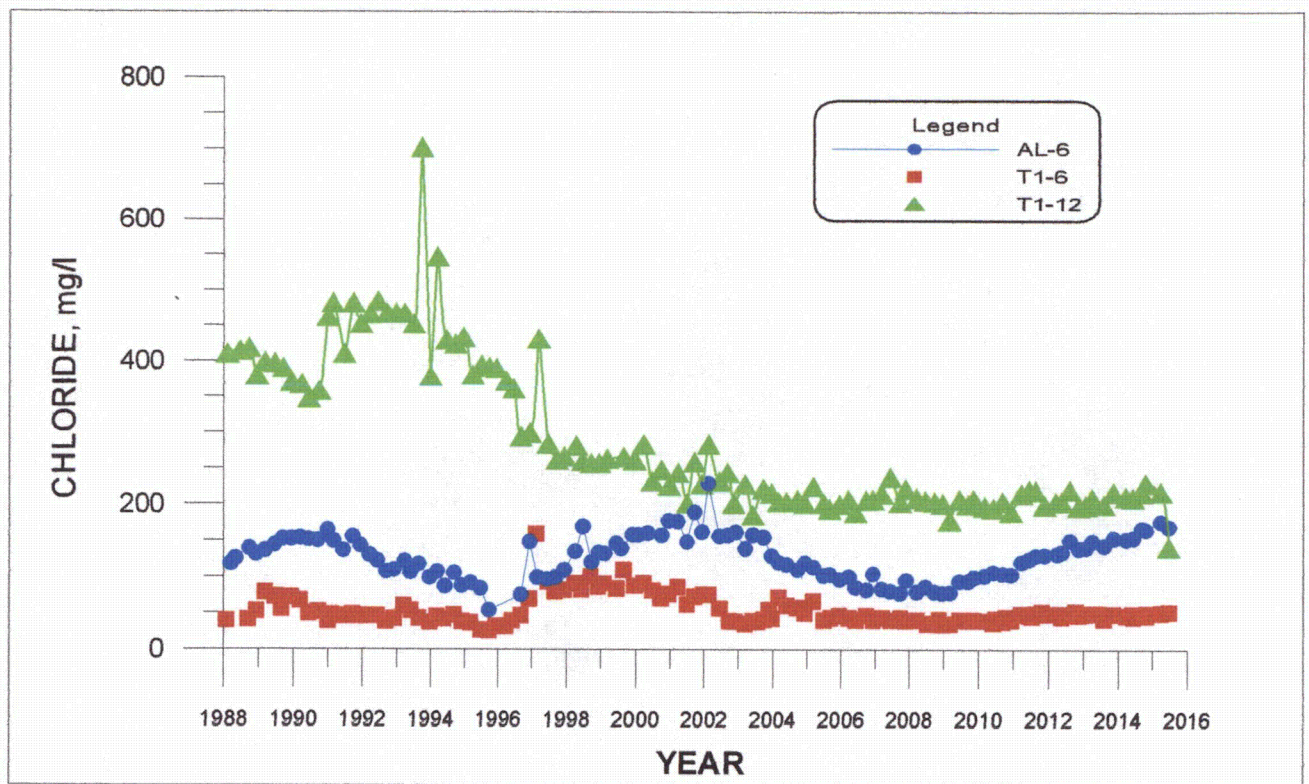


FIGURE 4. CHLORIDE CONCENTRATIONS VERSUS TIME FOR WELLS T1-6, T1-12, AL-1, AL-6 AND AL-7.

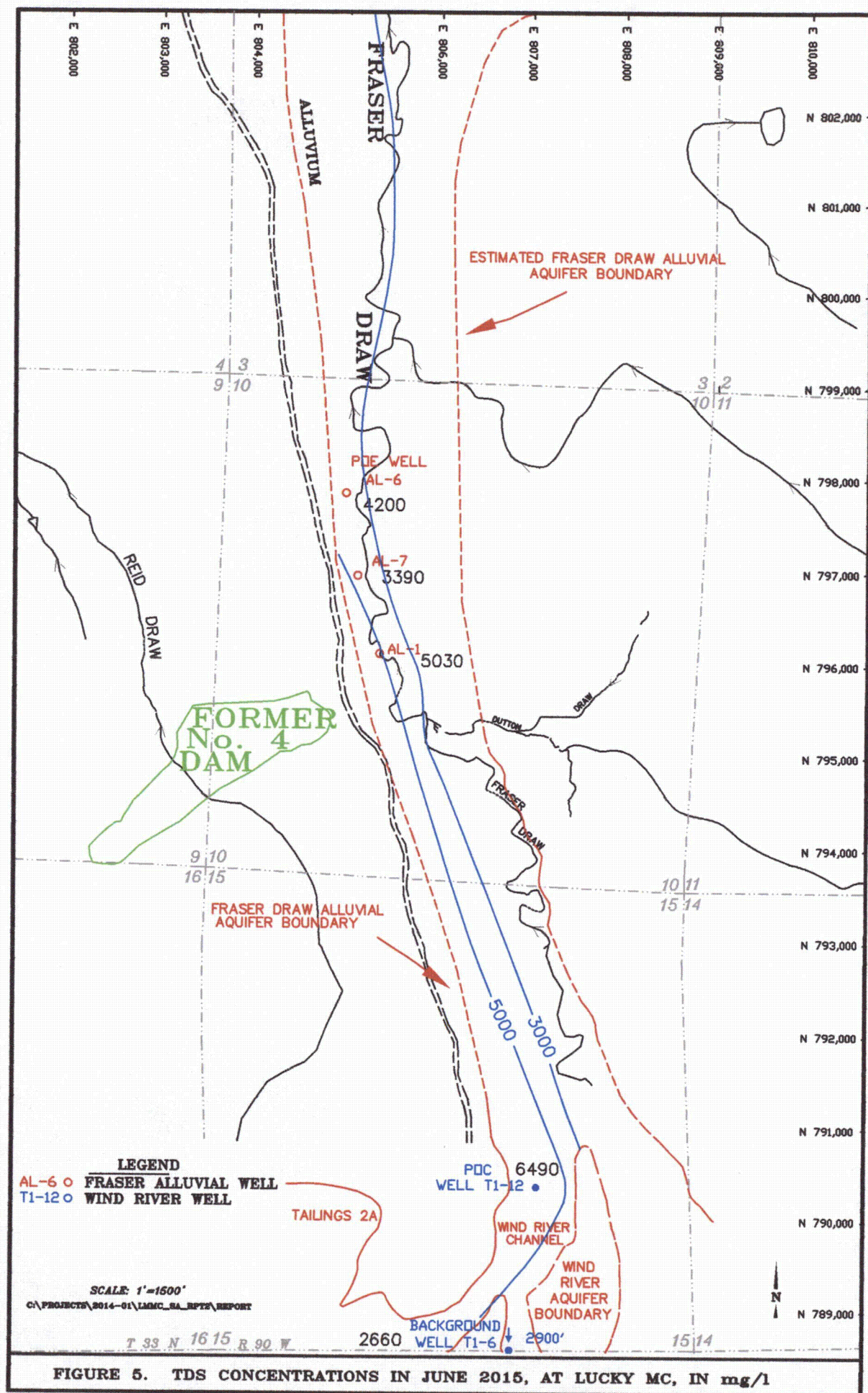


FIGURE 5. TDS CONCENTRATIONS IN JUNE 2015, AT LUCKY MC, IN mg/l

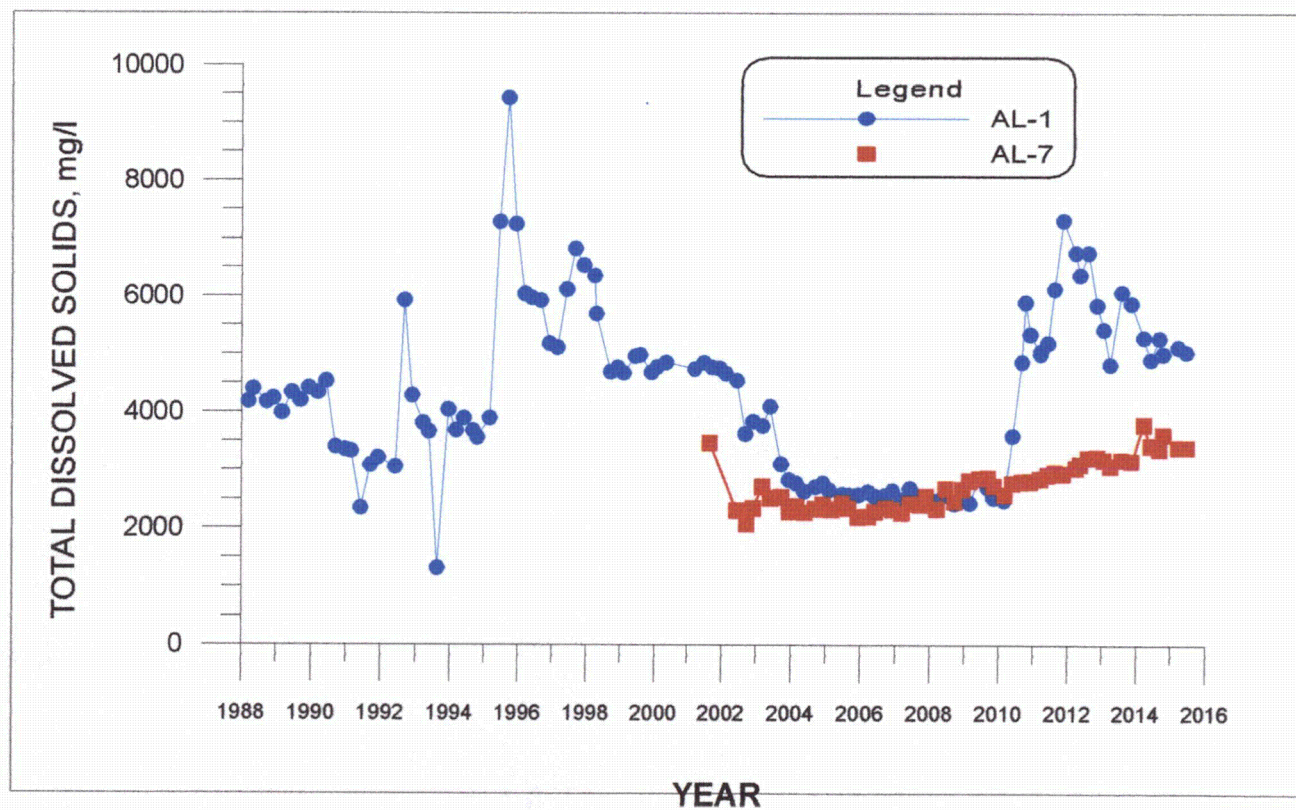
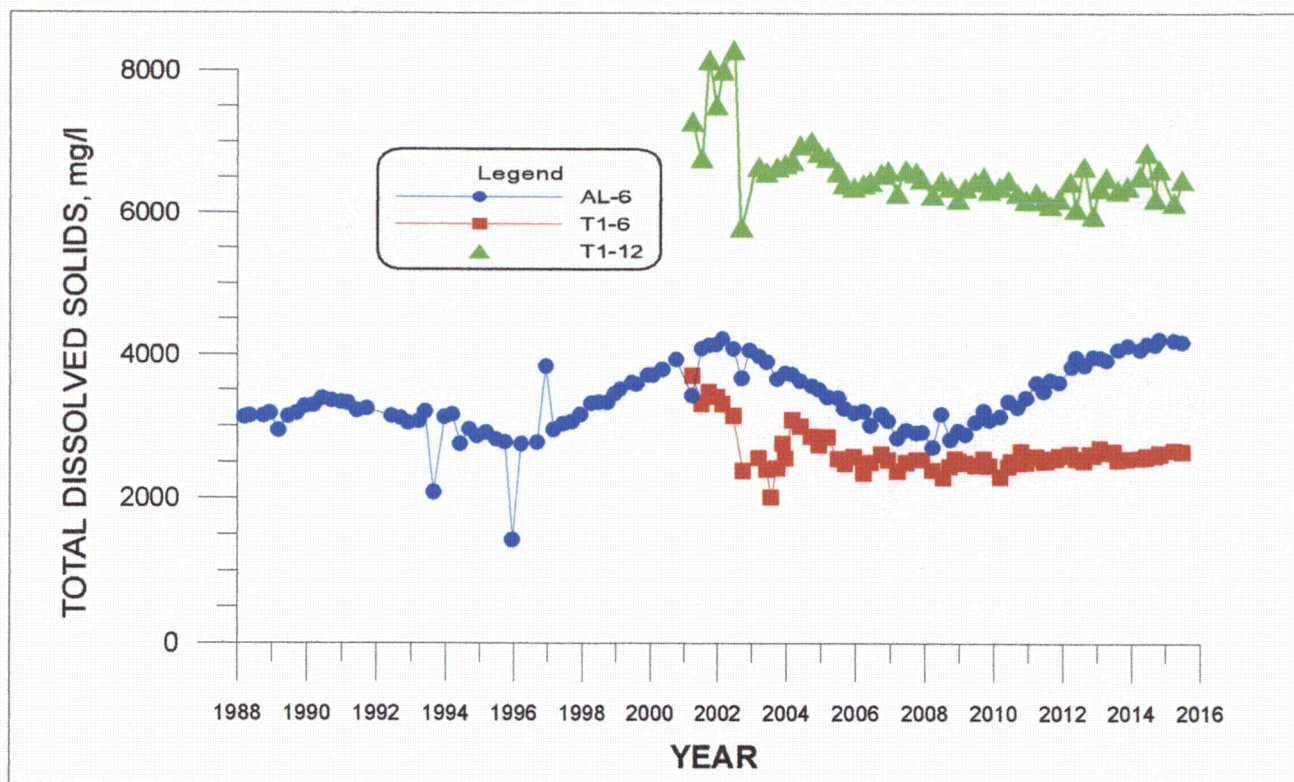


FIGURE 6. TDS CONCENTRATIONS VERSUS TIME FOR WELLS T1-6, T1-12, AL-1, AL-6 AND AL-7.

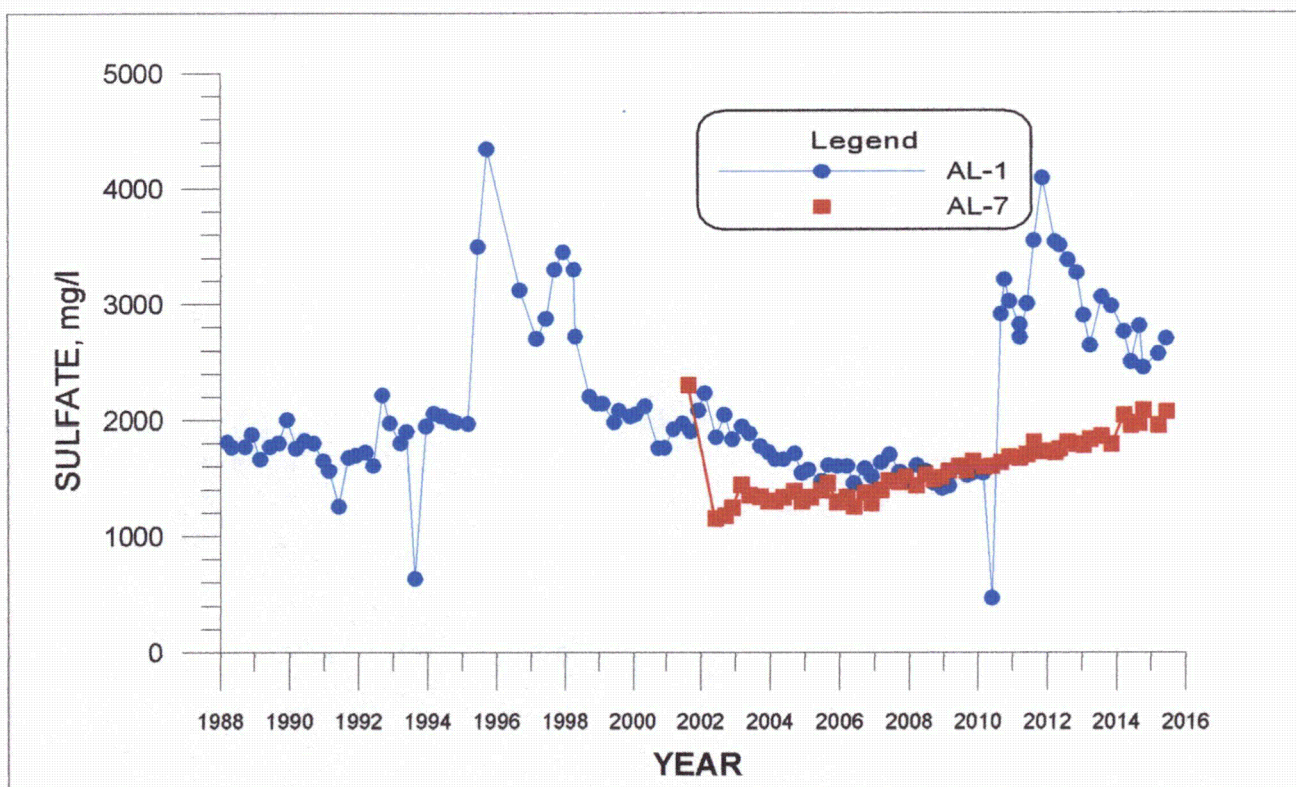
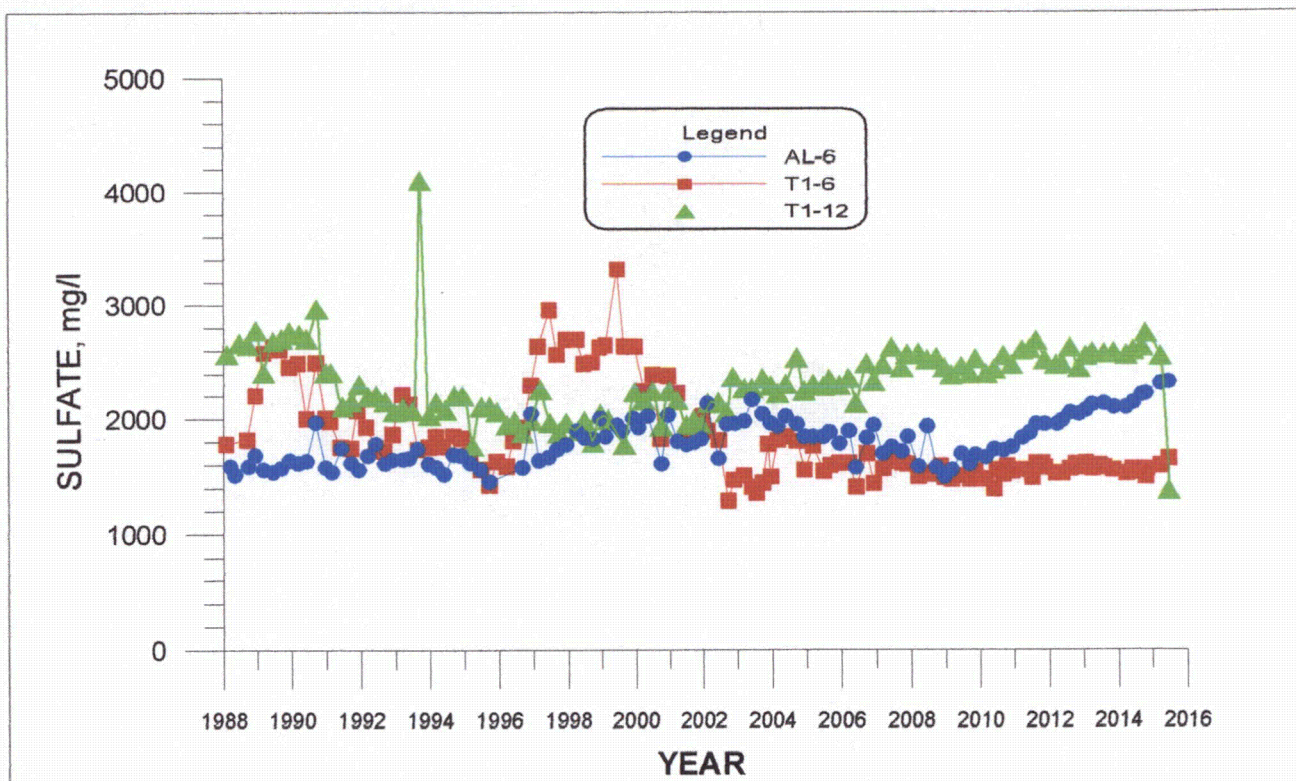
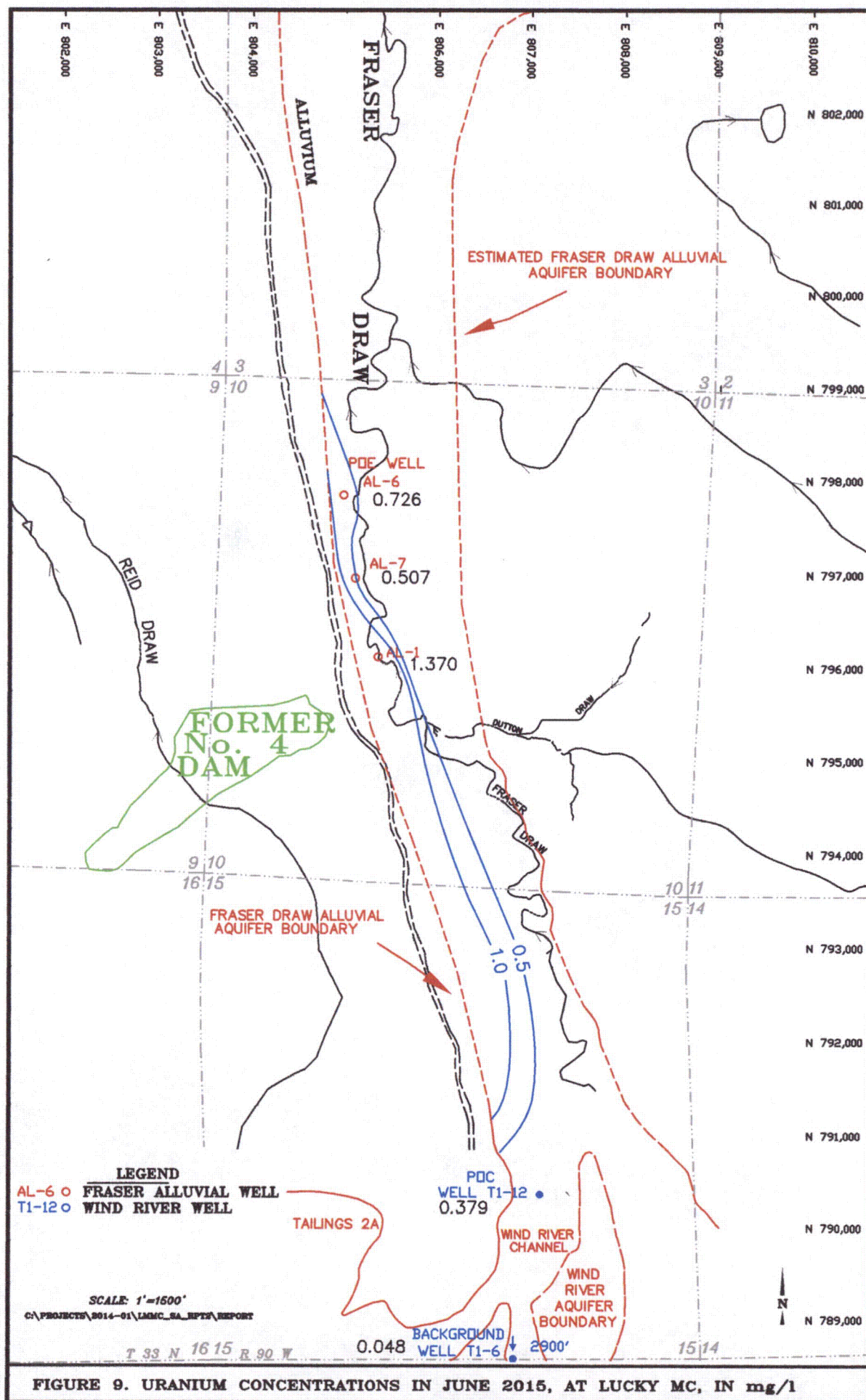


FIGURE 8. SULFATE CONCENTRATIONS VERSUS TIME FOR WELLS T1-6, T1-12, AL-1, AL-6 AND AL-7.



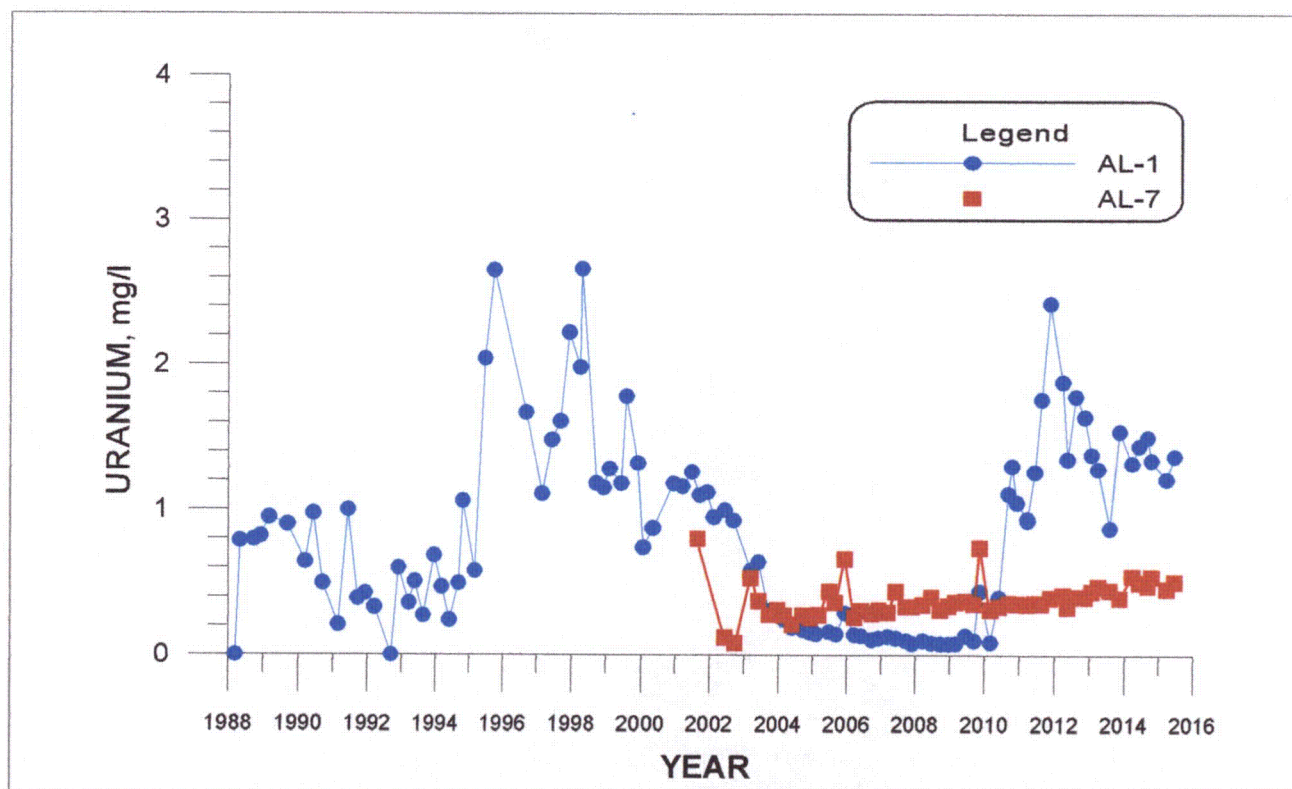
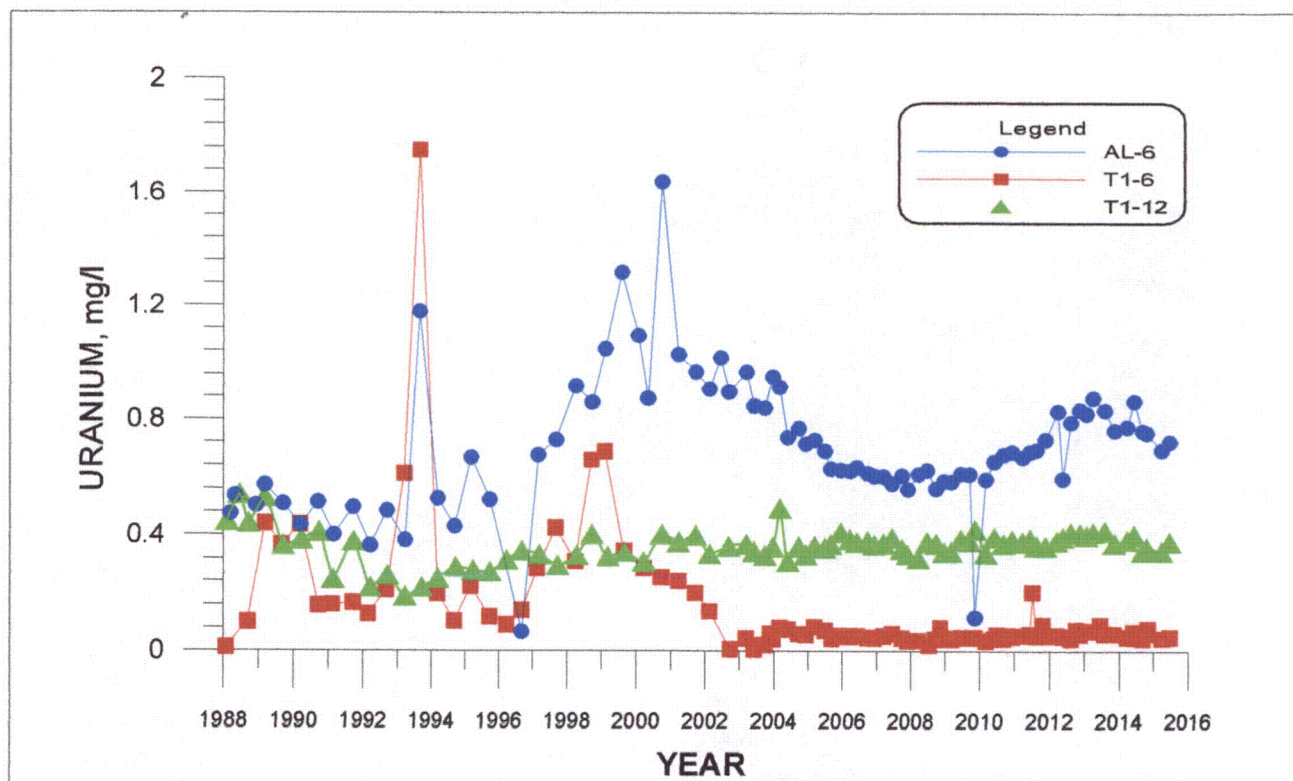


FIGURE 10. URANIUM CONCENTRATIONS VERSUS TIME FOR WELLS T1-6, T1-12, AL-1, AL-6 AND AL-7.

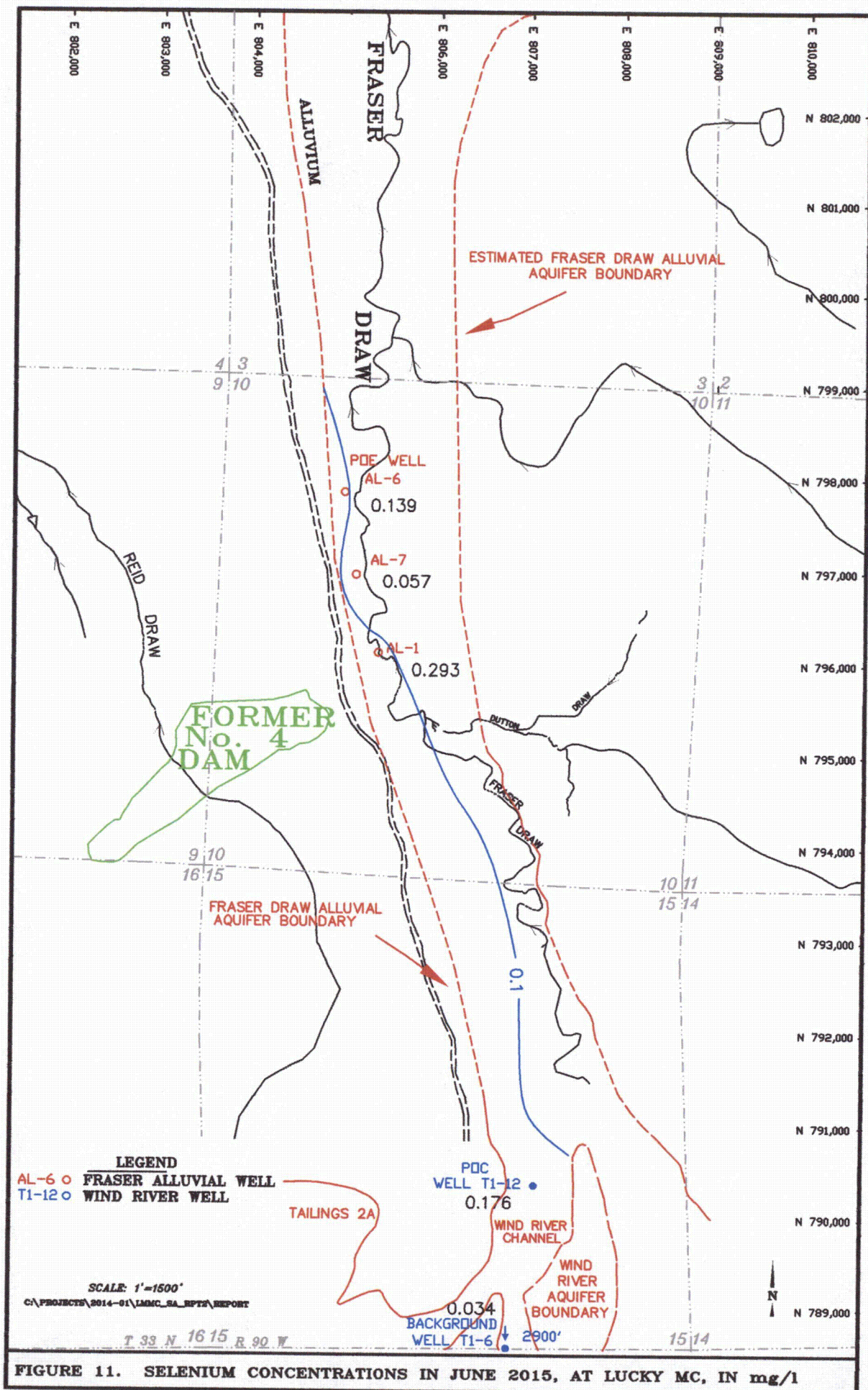


FIGURE 11. SELENIUM CONCENTRATIONS IN JUNE 2015, AT LUCKY MC, IN mg/l

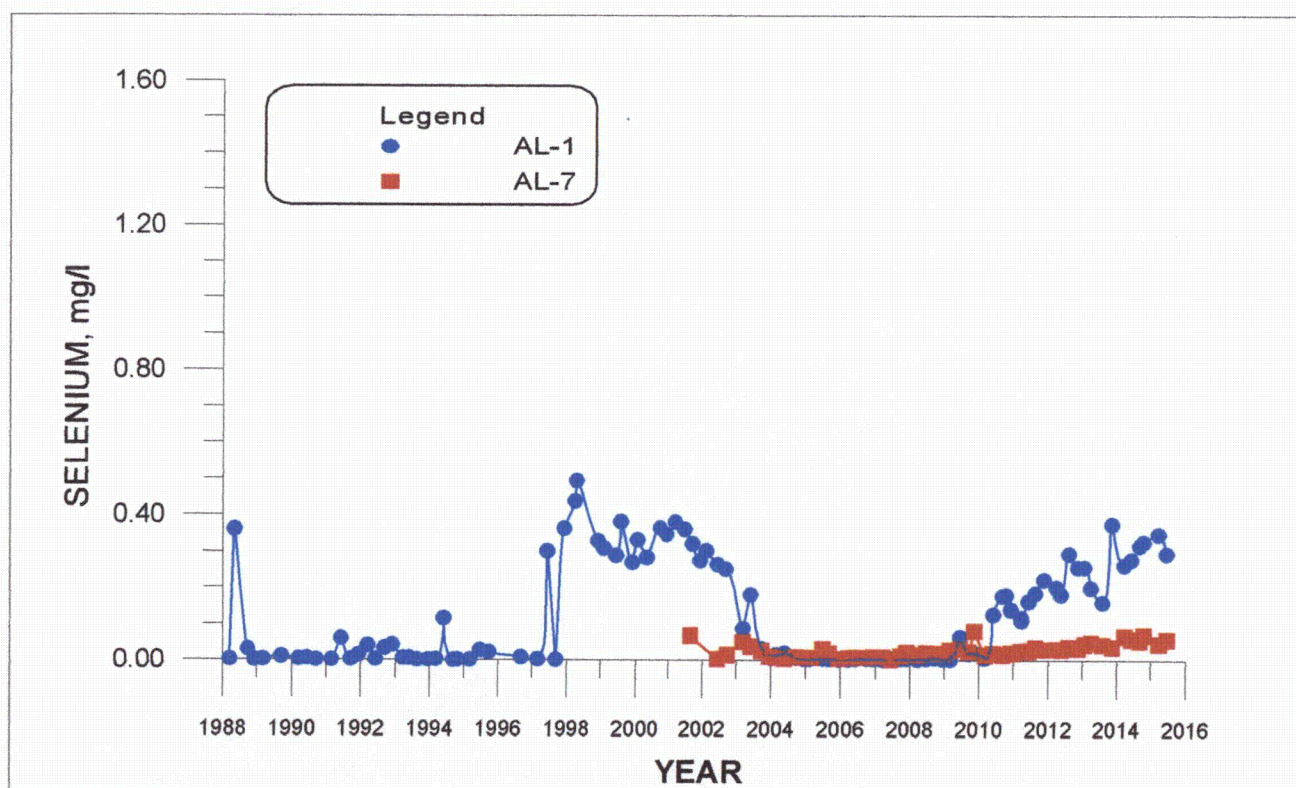
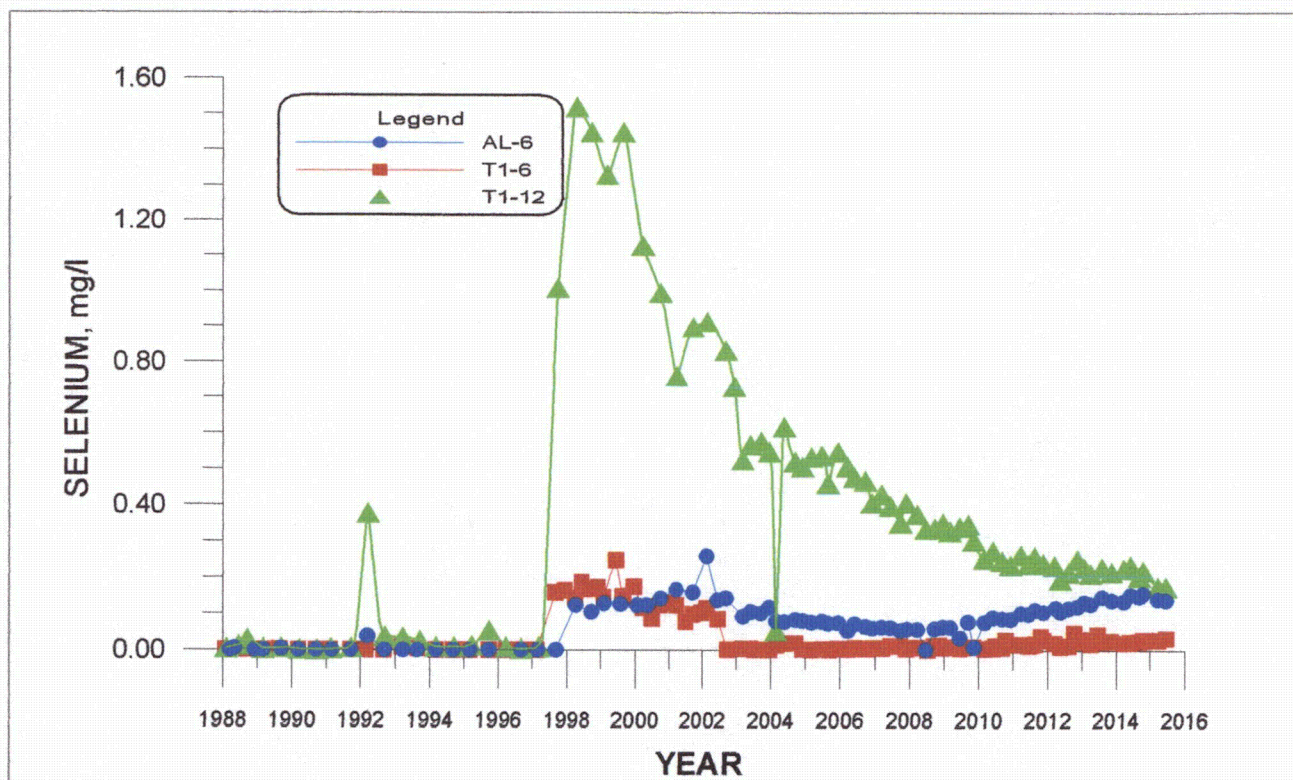
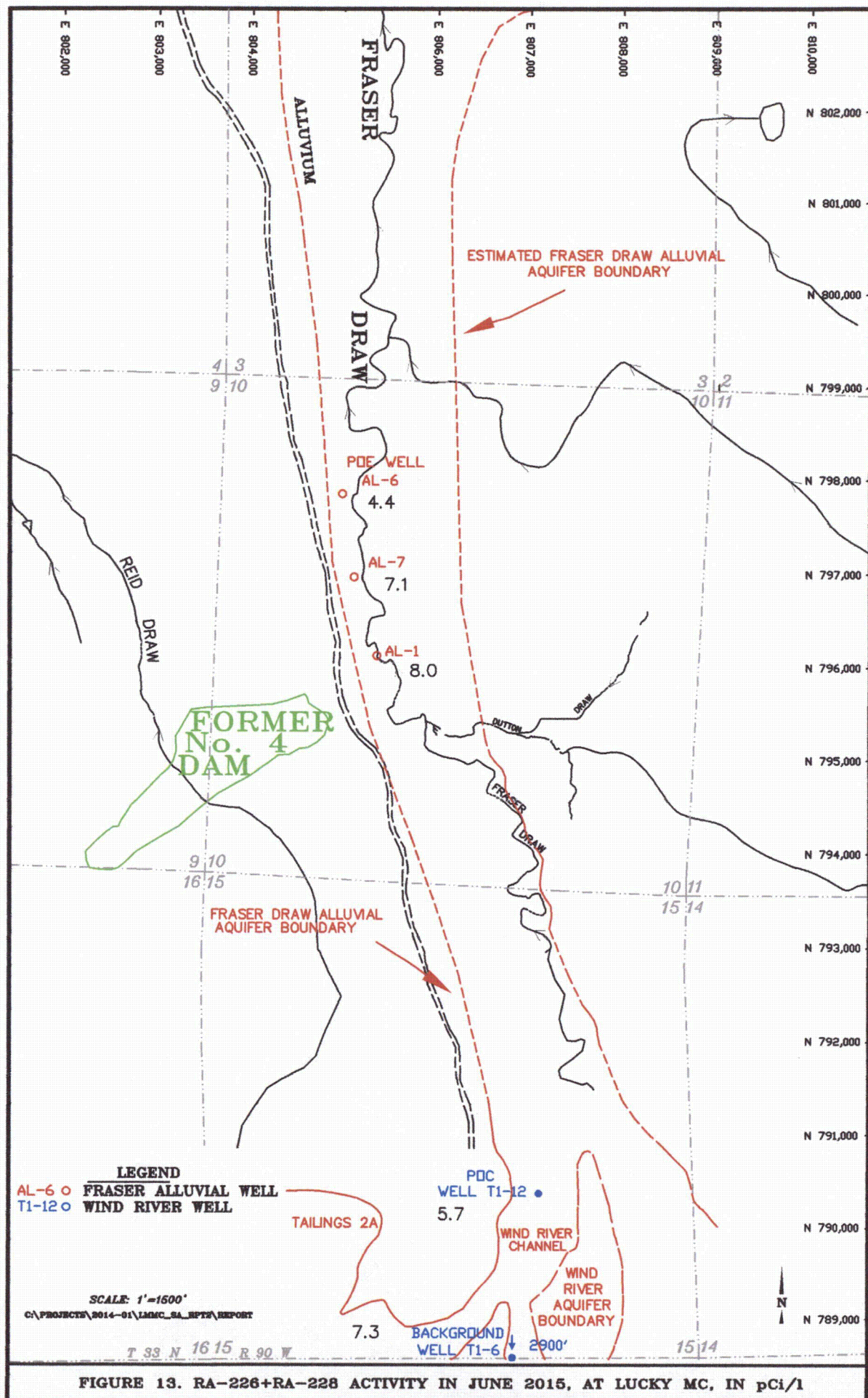


FIGURE 12. SELENIUM CONCENTRATIONS VERSUS TIME FOR WELLS T1-6, T1-12, AL-1, AL-6 AND AL-7.



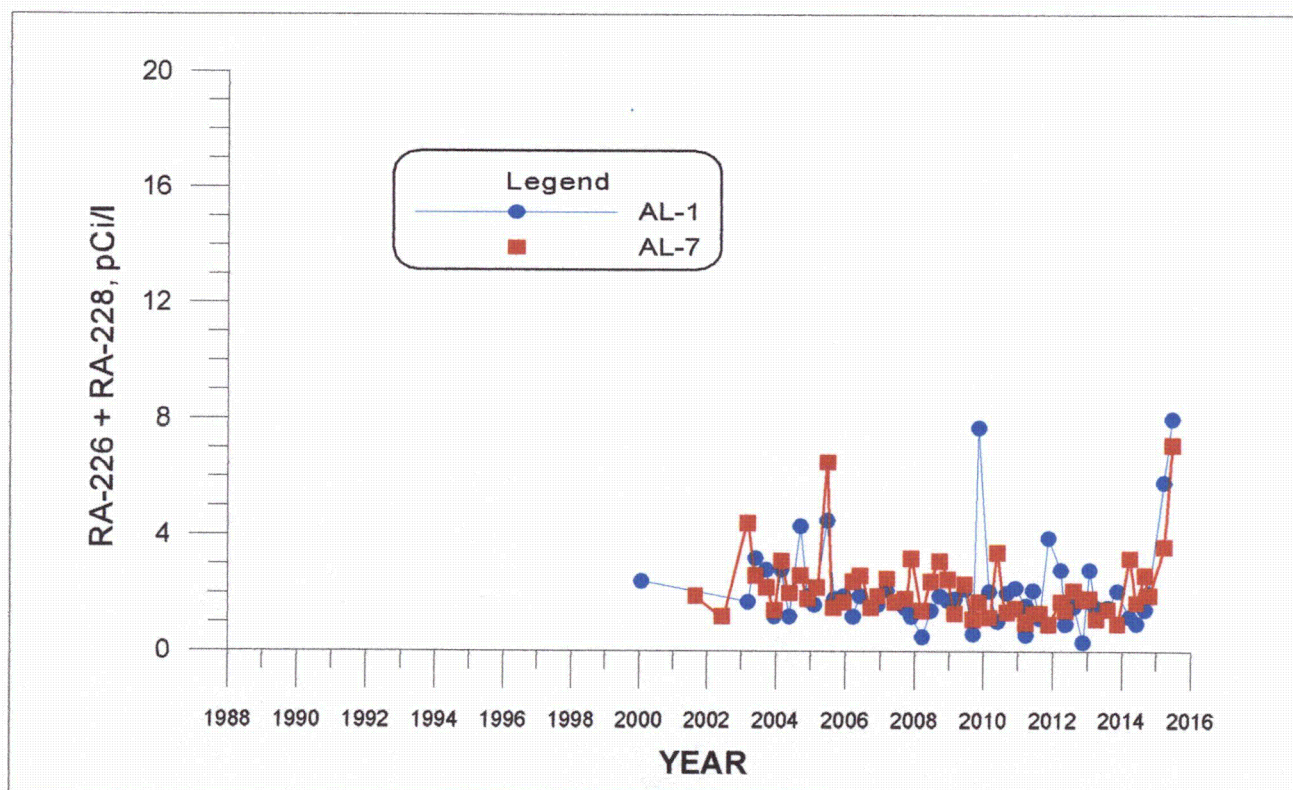
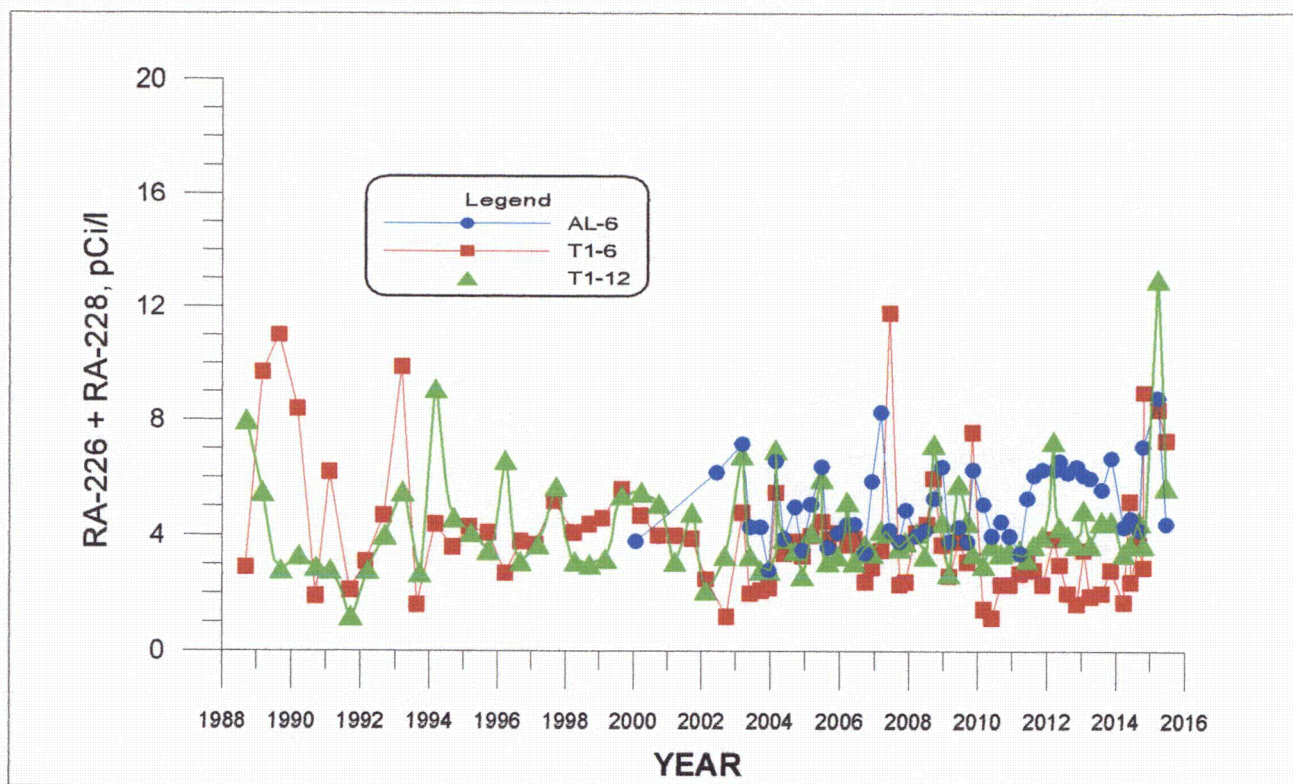


FIGURE 14. RADIUM-226 + RADIUM-228 ACTIVITY VERSUS TIME FOR WELLS T1-6, T1-12, AL-1, AL-6 AND AL-7.

TABLE 1. WATER-LEVEL AND WATER-QUALITY DATA.

Lucky MC Mine - Pathfinder Mines Corp.

Sample Point Name	Date	WL (feet)	WL_ELEV (ft-msl)	pH(f) (std. units)	Cond(f) (µmhos)	TDS (mg/l)	SO4 (mg/l)	Cl (mg/l)	NO3+NO2 (mg/l)	Unat (mg/l)
AL-1	3/27/2012	26.83	6237.77	6.7	3990	6750	3540	307.0	76.0	1.880
	5/16/2012	26.51	6238.09	6.8	3040	6360	3510	291.0	62.0	1.350
	8/9/2012	27.08	6237.52	6.9	3030	6750	3380	326.0	123.0	1.780
	11/13/2012	27.05	6237.55	6.8	3020	5840	3270	295.0	78.0	1.640
	1/22/2013	26.78	6237.82	6.4	1690	5420	2900	262.0	67.0	1.380
	4/1/2013	26.54	6238.06	6.9	5870	4820	2640	238.0	61.0	1.280
	8/2/2013	27.00	6237.60	7.3	6440	6060	3060	260.0	117.0	0.873
	11/12/2013	27.58	6237.02	7.4	6880	5870	2980	293.0	117.0	1.540
	3/26/2014	26.91	6237.69	7.2	6210	5280	2760	255.0	94.0	1.320
	6/6/2014	—	—	6.9	6020	4900	2500	215.0	103.0	1.440
	9/5/2014	27.50	6237.10	7.4	2950	5270	2810	256.0	126.0	1.500
	10/17/2014	27.54	6237.06	6.9	5310	5000	2450	233.0	114.0	1.340
	3/24/2015	27.38	6237.22	7.5	5520	5120	2570	257.0	98.0	1.210
	6/16/2015	27.17	6237.43	7.3	6600	5030	2700	253.0	98.0	1.370
AL-6	3/27/2012	23.13	6213.67	6.6	1942	3850	1960	132.0	78.0	0.832
	5/16/2012	22.95	6213.85	6.9	1483	3980	1990	135.0	72.0	0.596
	8/9/2012	23.22	6213.58	7.0	1504	3870	2060	151.0	83.0	0.793
	11/13/2012	22.98	6213.82	6.9	1562	3990	2050	140.0	79.0	0.837
	1/22/2013	22.80	6214.00	6.5	1349	3980	2080	141.0	77.0	0.824
	4/1/2013	22.68	6214.12	7.0	4600	3940	2130	150.0	59.0	0.879
	8/2/2013	22.82	6213.98	7.4	4280	4090	2140	144.0	84.0	0.836
	11/12/2013	22.72	6214.08	7.5	4790	4150	2110	154.0	79.0	0.765
	3/26/2014	22.45	6214.35	7.3	4720	4090	2110	153.0	84.0	0.778
	6/6/2014	—	—	7.1	4880	4170	2150	155.0	81.0	0.868
	9/5/2014	22.68	6214.12	7.7	4550	4160	2220	168.0	86.0	0.764
	10/17/2014	22.61	6214.19	6.8	4660	4240	2230	166.0	77.0	0.757
	3/24/2015	22.58	6214.22	7.4	4600	4220	2320	177.0	72.0	0.697
	6/16/2015	22.43	6214.37	7.4	5510	4200	2330	170.0	70.0	0.726
AL-7	3/27/2012	27.26	6224.74	6.6	1818	3030	1720	89.0	16.0	0.412
	5/16/2012	27.05	6224.95	6.9	1331	3100	1750	91.0	16.0	0.332
	8/9/2012	27.24	6224.76	7.0	1424	3210	1810	101.0	21.0	0.403
	11/13/2012	27.08	6224.92	6.9	1435	3220	1790	92.0	16.0	0.401
	1/22/2013	26.83	6225.17	6.4	1256	3170	1780	93.0	19.0	0.439
	4/1/2013	26.62	6225.38	7.0	3910	3070	1830	101.0	18.0	0.474
	8/2/2013	26.76	6225.24	7.4	3680	3170	1860	96.0	18.0	0.445
	11/12/2013	26.86	6225.14	7.4	3910	3150	1790	98.0	16.0	0.393
	3/26/2014	26.52	6225.48	7.5	4320	3780	2040	124.0	56.0	0.544
	6/6/2014	—	—	7.3	4170	3420	1950	107.0	28.0	0.503
	9/5/2014	26.81	6225.19	7.5	3860	3370	1970	111.0	23.0	0.477
	10/17/2014	26.88	6225.12	6.8	4060	3610	2080	120.0	30.0	0.542
	3/24/2015	26.76	6225.24	7.2	3970	3390	1950	112.0	14.0	0.457
	6/16/2015	26.58	6225.42	7.3	4720	3390	2070	114.0	16.1	0.507
T1-6	3/14/2012	29.64	6398.58	6.9	1293	2630	1530	49.0	0.7	0.054
	5/16/2012	28.98	6399.24	7.2	1090	2560	1530	45.0	0.4	0.050

TABLE 1. WATER-LEVEL AND WATER-QUALITY DATA. (cont'd)

Lucky MC Mine - Pathfinder Mines Corp.

Sample Point Name	Date	WL (feet)	WL_ELEV (ft-msl)	pH(f) (std. units)	Cond(f) (µmhos)	TDS (mg/l)	SO4 (mg/l)	Cl (mg/l)	NO3+NO2 (mg/l)	Unat (mg/l)
T1-6	8/9/2012	29.29	6398.93	7.3	1193	2530	1570	49.0	0.9	0.044
	10/10/2012	29.04	6399.18	7.0	1173	2630	1610	53.0	1.8	0.074
	11/13/2012	28.84	6399.38	7.2	1301	2600	1580	48.0	0.9	0.058
	1/22/2013	29.36	6398.86	6.7	1058	2710	1620	49.0	1.0	0.069
	4/1/2013	28.41	6399.81	6.7	3400	2650	1570	50.0	0.6	0.070
	6/17/2013	29.53	6398.69	7.5	1886	2660	1600	50.0	< 0.1	0.089
	8/2/2013	29.67	6398.55	7.7	3280	2540	1580	43.0	0.9	0.061
	11/7/2013	29.55	6398.67	7.7	2990	2560	1560	49.0	0.8	0.059
	3/26/2014	29.18	6399.04	7.6	3460	2570	1530	47.0	0.7	0.048
	5/29/2014	28.69	6399.53	7.8	3340	2580	1570	49.0	0.7	0.067
	6/6/2014	—	—	6.6	3520	2600	1540	45.0	0.8	0.047
	9/5/2014	30.00	6398.22	7.2	3420	2600	1560	47.0	0.8	0.043
	10/17/2014	29.89	6398.33	6.9	3590	2640	1500	47.0	0.9	0.059
	10/29/2014	29.01	6399.21	7.2	3320	2620	1570	50.0	1.1	0.078
	3/24/2015	29.50	6398.72	7.5	3300	2680	1600	51.0	0.8	0.045
	6/16/2015	29.66	6398.56	8.0	3970	2660	1660	52.0	0.9	0.048
T1-12	3/14/2012	19.50	6321.30	6.0	3440	6460	2480	204.0	233.0	0.380
	5/16/2012	18.22	6322.58	6.2	1790	6080	2490	205.0	194.0	0.393
	8/9/2012	19.29	6321.51	6.3	1692	6680	2630	221.0	239.0	0.410
	11/13/2012	19.88	6320.92	6.3	3040	5980	2450	198.0	278.0	0.406
	1/22/2013	19.96	6320.84	5.8	1713	6370	2560	200.0	213.0	0.399
	4/1/2013	20.15	6320.65	6.3	7300	6520	2590	210.0	220.0	0.409
	8/2/2013	20.03	6320.77	7.7	3280	6350	2580	201.0	221.0	0.415
	11/12/2013	20.23	6320.57	6.8	7480	6400	2590	218.0	215.0	0.373
	3/26/2014	19.78	6321.02	6.7	7690	6550	2570	212.0	262.0	0.384
	6/6/2014	—	—	6.6	7760	6880	2610	211.0	268.0	0.402
	9/5/2014	20.23	6320.57	6.7	3390	6230	2640	218.0	209.0	0.345
	10/17/2014	20.30	6320.50	6.5	7560	6640	2760	231.0	246.0	0.358
	3/24/2015	20.58	6320.22	6.7	6450	6170	2560	219.0	199.0	0.345
	6/16/2015	20.85	6319.95	6.5	8510	6490	1380	143.0	185.0	0.379

TABLE 1. WATER-LEVEL AND WATER-QUALITY DATA. (cont'd)

Lucky MC Mine - Pathfinder Mines Corp.

Sample Point Name	Date	Th230 (pCi/l)	Th230(e) (pCi/l)	Ra226 (pCi/l)	Ra226(e) (pCi/l)	Ra228 (pCi/l)	Ra228(e) (pCi/l)	Ra226+Ra228 (pCi/l)
AL-1	3/27/2012	-0.020	± 0.1	2.2	± 0.3	0.6	± 0.6	2.8
	5/16/2012	0.100	± 0.1	0.7	± 0.2	0.2	± 0.8	0.9
	8/9/2012	0.009	± 0.1	0.6	± 0.2	0.9	± 0.8	1.5
	11/13/2012	0.040	± 0.1	0.4	± 0.2	0.0	± 0.8	0.3
	1/22/2013	0.080	± 0.1	1.2	± 0.2	1.6	± 0.7	2.8
	4/1/2013	0.090	± 0.1	1.2	± 0.2	0.3	± 0.9	1.5
	8/2/2013	0.100	± 0.1	0.7	± 0.2	0.8	± 0.8	1.5
	11/12/2013	0.100	± 0.1	0.4	± 0.2	1.7	± 0.7	2.1
	3/26/2014	0.060	± 0.1	0.7	± 0.2	0.5	± 0.8	1.2
	6/6/2014	0.200	± 0.1	0.4	± 0.1	0.6	± 0.8	1.0
	9/5/2014	-0.030	± 0.4	0.5	± 0.2	0.9	± 0.9	1.4
	10/17/2014	0.100	± 0.1	0.5	± 0.2	1.5	± 0.9	2.0
	3/24/2015	0.100	± 0.1	3.5	± 0.7	2.3	± 0.8	5.8
	6/16/2015	0.090	± 0.1	3.8	± 0.8	4.2	± 1.1	8.0
AL-6	3/27/2012	0.080	± 0.1	4.7	± 0.4	1.6	± 0.6	6.3
	5/16/2012	0.050	± 0.1	3.9	± 0.5	2.7	± 1.4	6.6
	8/9/2012	0.100	± 0.1	4.2	± 0.5	2.0	± 0.8	6.2
	11/13/2012	-0.008	± 0.1	4.5	± 0.5	1.9	± 1.0	6.4
	1/22/2013	0.100	± 0.1	4.0	± 0.4	2.1	± 0.8	6.1
	4/1/2013	0.070	± 0.1	4.3	± 0.4	1.7	± 1.1	6.0
	8/2/2013	0.060	± 0.1	3.7	± 0.4	1.9	± 0.9	5.6
	11/12/2013	0.200	± 0.1	4.8	± 0.4	1.9	± 0.8	6.7
	3/26/2014	0.030	± 0.1	3.0	± 0.3	1.3	± 0.8	4.3
	6/6/2014	0.100	± 0.1	3.5	± 0.3	1.1	± 0.7	4.6
	9/5/2014	0.080	± 0.4	2.5	± 0.3	1.7	± 0.9	4.2
	10/17/2014	0.100	± 0.1	3.0	± 0.3	4.1	± 0.9	7.1
	3/24/2015	0.040	± 0.1	6.0	± 1.2	2.8	± 0.8	8.8
	6/16/2015	3.200	± 0.6	3.6	± 0.8	0.8	± 0.7	4.4
AL-7	3/27/2012	0.070	± 0.1	0.9	± 0.2	0.8	± 0.6	1.7
	5/16/2012	0.030	± 0.1	0.5	± 0.2	0.9	± 0.9	1.4
	8/9/2012	0.020	± 0.1	0.8	± 0.2	1.3	± 0.8	2.1
	11/13/2012	0.060	± 0.1	0.7	± 0.2	1.1	± 1.0	1.8
	1/22/2013	0.300	± 0.2	0.8	± 0.2	1.0	± 0.7	1.8
	4/1/2013	0.090	± 0.1	0.7	± 0.2	0.4	± 1.0	1.1
	8/2/2013	0.100	± 0.1	0.7	± 0.2	0.8	± 0.8	1.5
	11/12/2013	0.100	± 0.1	0.4	± 0.2	0.6	± 0.6	1.0
	3/26/2014	0.040	± 0.1	0.9	± 0.2	2.3	± 1.0	3.2
	6/6/2014	0.100	± 0.1	0.9	± 0.2	0.8	± 0.7	1.7
	9/5/2014	0.010	± 0.1	0.8	± 0.2	1.8	± 1.0	2.6
	10/17/2014	0.100	± 0.1	0.5	± 0.2	1.4	± 0.9	1.9
	3/24/2015	0.100	± 0.1	1.4	± 0.4	2.2	± 0.8	3.6
	6/16/2015	0.100	± 0.1	6.6	± 1.3	0.5	± 0.8	7.1
T1-6	3/14/2012	0.400	± 0.2	2.6	± 0.3	1.3	± 0.6	3.9
	5/16/2012	0.070	± 0.1	2.0	± 0.3	1.0	± 0.8	3.0

TABLE 1. WATER-LEVEL AND WATER-QUALITY DATA. (cont'd)

Lucky MC Mine - Pathfinder Mines Corp.

Sample Point Name	Date	Th230 (pCi/l)	Th230(e) (pCi/l)	Ra226 (pCi/l)	Ra226(e) (pCi/l)	Ra228 (pCi/l)	Ra228(e) (pCi/l)	Ra226+Ra228 (pCi/l)
T1-6	8/9/2012	-0.008	± 0.1	1.3	± 0.3	0.7	± 0.7	2.0
	10/10/2012	---	---	3.5	± 0.4	---	---	---
	11/13/2012	0.010	± 0.1	0.9	± 0.3	0.7	± 1.2	1.6
	1/22/2013	1.400	± 0.4	2.5	± 0.3	1.0	± 0.7	3.5
	4/1/2013	0.020	± 0.1	2.1	± 0.3	-0.2	± 1.2	1.9
	6/17/2013	---	---	5.9	± 0.5	---	---	---
	8/2/2013	0.100	± 0.1	1.3	± 0.2	0.7	± 0.8	2.0
	11/7/2013	0.300	± 0.2	1.9	± 0.3	0.9	± 1.2	2.8
	3/26/2014	-0.020	± 0.1	1.5	± 0.2	0.2	± 0.7	1.7
	5/29/2014	---	---	2.8	± 0.3	2.4	± 0.7	5.2
	6/6/2014	0.100	± 0.1	1.9	± 0.3	0.5	± 0.8	2.4
	9/5/2014	0.040	± 0.2	1.7	± 0.3	2.0	± 0.9	3.7
	10/17/2014	-0.010	± 0.1	1.4	± 0.2	1.5	± 0.8	2.9
	10/29/2014	---	---	7.3	± 0.5	1.7	± 0.8	9.0
	3/24/2015	0.009	± 0.1	5.4	± 1.1	3.0	± 0.9	8.4
	6/16/2015	0.070	± 0.1	6.3	± 1.3	1.0	± 0.8	7.3
T1-12	3/14/2012	0.200	± 0.2	3.9	± 0.6	3.4	± 1.4	7.3
	5/16/2012	2.300	± 0.4	2.9	± 0.4	1.4	± 0.9	4.3
	8/9/2012	0.040	± 0.1	2.3	± 0.3	1.7	± 0.7	4.0
	11/13/2012	0.200	± 0.1	2.2	± 0.4	1.5	± 1.2	3.7
	1/22/2013	1.900	± 0.5	3.0	± 0.3	1.9	± 0.7	4.9
	4/1/2013	0.040	± 0.1	2.8	± 0.4	0.9	± 1.5	3.7
	8/2/2013	0.200	± 0.2	2.1	± 0.4	2.4	± 1.6	4.5
	11/12/2013	0.080	± 0.1	1.7	± 0.3	2.8	± 1.1	4.5
	3/26/2014	0.006	± 0.1	1.9	± 0.3	1.5	± 1.1	3.4
	6/6/2014	0.100	± 0.1	1.8	± 0.4	1.9	± 1.7	3.7
	9/5/2014	0.090	± 0.4	2.5	± 0.7	2.0	± 2.9	4.5
	10/17/2014	0.070	± 0.1	1.4	± 0.2	2.3	± 0.8	3.7
	3/24/2015	-0.030	± 0.3	9.6	± 2.0	3.4	± 1.2	13.0
	6/16/2015	0.400	± 0.8	4.9	± 1.0	0.8	± 0.7	5.7

TABLE 1. WATER-LEVEL AND WATER-QUALITY DATA. (cont'd)

Lucky MC Mine - Pathfinder Mines Corp.

Sample Point Name	Date	As (mg/l)	Be (mg/l)	Cd (mg/l)	Cr (mg/l)	Ni (mg/l)	Se (mg/l)
AL-1	3/27/2012	0.004	< 0.010	< 0.005	< 0.05	< 0.05	0.201
	5/16/2012	0.002	< 0.010	< 0.005	< 0.05	< 0.05	0.181
	8/9/2012	0.005	< 0.001	< 0.001	< 0.01	0.03	0.293
	11/13/2012	0.003	< 0.001	< 0.001	< 0.01	0.03	0.255
	1/22/2013	0.004	< 0.001	< 0.001	0.01	0.03	0.256
	4/1/2013	0.004	< 0.001	< 0.001	< 0.01	0.02	0.199
	8/2/2013	0.001	< 0.001	< 0.001	< 0.01	0.02	0.159
	11/12/2013	0.005	< 0.001	< 0.001	< 0.01	0.03	0.374
	3/26/2014	0.002	< 0.001	< 0.001	< 0.01	0.04	0.262
	6/6/2014	0.003	< 0.001	< 0.001	< 0.01	0.02	0.277
	9/5/2014	0.005	< 0.001	< 0.001	< 0.01	0.04	0.315
	10/17/2014	0.002	< 0.001	< 0.001	< 0.01	0.02	0.325
	3/24/2015	0.011	< 0.001	< 0.001	< 0.01	0.02	0.346
	6/16/2015	0.005	< 0.001	< 0.001	< 0.01	0.02	0.293
AL-6	3/27/2012	0.006	< 0.010	< 0.005	< 0.05	< 0.05	0.118
	5/16/2012	0.005	< 0.010	< 0.005	< 0.05	< 0.05	0.107
	8/9/2012	0.006	< 0.001	< 0.001	< 0.01	< 0.01	0.116
	11/13/2012	0.007	< 0.001	< 0.001	< 0.01	< 0.01	0.121
	1/22/2013	0.008	< 0.001	< 0.001	< 0.01	0.01	0.133
	4/1/2013	0.007	< 0.001	< 0.001	< 0.01	< 0.01	0.128
	8/2/2013	0.008	< 0.001	< 0.001	< 0.01	0.01	0.147
	11/12/2013	0.008	< 0.001	< 0.001	< 0.01	< 0.01	0.138
	3/26/2014	0.008	0.001	< 0.001	< 0.01	0.01	0.135
	6/6/2014	0.006	< 0.001	< 0.001	< 0.01	0.01	0.153
	9/5/2014	0.009	< 0.001	< 0.001	< 0.01	0.01	0.149
	10/17/2014	0.005	< 0.001	< 0.001	< 0.01	0.01	0.157
	3/24/2015	0.006	< 0.001	< 0.001	< 0.01	< 0.01	0.142
	6/16/2015	0.011	< 0.001	0.003	< 0.01	0.01	0.139
AL-7	3/27/2012	< 0.001	< 0.010	< 0.005	< 0.05	< 0.05	0.031
	5/16/2012	< 0.001	< 0.010	< 0.005	< 0.05	< 0.05	0.030
	8/9/2012	0.004	< 0.001	< 0.001	< 0.01	0.01	0.037
	11/13/2012	0.002	< 0.001	< 0.001	< 0.01	0.02	0.033
	1/22/2013	0.001	< 0.001	< 0.001	< 0.01	0.02	0.044
	4/1/2013	0.001	< 0.001	< 0.001	< 0.01	0.01	0.048
	8/2/2013	0.003	< 0.001	< 0.001	< 0.01	0.01	0.043
	11/12/2013	0.002	< 0.001	< 0.001	< 0.01	0.01	0.037
	3/26/2014	0.001	0.001	< 0.001	< 0.01	0.02	0.066
	6/6/2014	0.001	< 0.001	< 0.001	< 0.01	0.02	0.059
	9/5/2014	0.002	< 0.001	< 0.001	< 0.01	0.02	0.054
	10/17/2014	< 0.001	< 0.001	< 0.001	< 0.01	0.01	0.069
	3/24/2015	0.003	< 0.001	< 0.001	< 0.01	0.02	0.045
	6/16/2015	0.002	< 0.001	< 0.001	< 0.01	0.02	0.057
T1-6	3/14/2012	< 0.001	< 0.010	< 0.005	< 0.05	< 0.05	0.021
	5/16/2012	< 0.001	< 0.010	< 0.005	< 0.05	< 0.05	0.011

TABLE 1. WATER-LEVEL AND WATER-QUALITY DATA. (cont'd)

Lucky MC Mine - Pathfinder Mines Corp.

Sample Point Name	Date	As (mg/l)	Be (mg/l)	Cd (mg/l)	Cr (mg/l)	Ni (mg/l)	Se (mg/l)
T1-6	8/9/2012	< 0.001	< 0.001	< 0.001	< 0.01	0.01	0.012
	10/10/2012	< 0.001	---	< 0.005	< 0.05	< 0.05	0.048
	11/13/2012	< 0.001	< 0.001	< 0.001	< 0.01	0.02	0.024
	1/22/2013	< 0.001	< 0.001	< 0.001	< 0.01	0.02	0.031
	4/1/2013	0.003	< 0.001	< 0.001	< 0.01	0.02	0.018
	6/17/2013	0.004	---	< 0.005	< 0.05	< 0.05	0.044
	8/2/2013	< 0.001	< 0.001	< 0.001	< 0.01	0.01	0.023
	11/7/2013	< 0.001	< 0.010	< 0.005	< 0.05	< 0.05	0.026
	3/26/2014	< 0.001	< 0.001	< 0.001	< 0.01	0.02	0.021
	5/29/2014	< 0.001	---	< 0.005	< 0.05	< 0.05	0.023
	6/6/2014	< 0.001	< 0.001	< 0.001	< 0.01	0.02	0.022
	9/5/2014	< 0.001	< 0.001	< 0.001	< 0.01	0.02	0.024
	10/17/2014	< 0.001	< 0.001	< 0.001	< 0.01	0.01	0.027
	10/29/2014	< 0.001	---	< 0.005	< 0.05	< 0.05	0.029
	3/24/2015	0.001	< 0.001	< 0.001	< 0.01	0.02	0.029
	6/16/2015	< 0.001	< 0.001	< 0.001	< 0.01	0.02	0.034
T1-12	3/14/2012	< 0.001	< 0.010	< 0.005	< 0.05	0.27	0.234
	5/16/2012	< 0.001	< 0.010	< 0.005	< 0.05	0.29	0.197
	8/9/2012	< 0.001	< 0.001	< 0.001	< 0.01	0.26	0.216
	11/13/2012	< 0.001	< 0.001	< 0.001	< 0.01	0.27	0.251
	1/22/2013	0.002	< 0.001	< 0.001	0.02	0.30	0.229
	4/1/2013	0.003	< 0.001	< 0.001	0.01	0.26	0.213
	8/2/2013	< 0.001	< 0.001	< 0.001	0.01	0.30	0.228
	11/12/2013	0.003	< 0.001	< 0.001	< 0.01	0.26	0.217
	3/26/2014	0.002	< 0.001	< 0.001	< 0.01	0.25	0.226
	6/6/2014	< 0.001	< 0.001	< 0.001	< 0.01	0.26	0.235
	9/5/2014	0.003	< 0.001	< 0.001	< 0.01	0.29	0.204
	10/17/2014	< 0.001	< 0.001	< 0.001	< 0.01	0.26	0.220
	3/24/2015	0.005	< 0.001	< 0.001	0.01	0.27	0.176
	6/16/2015	0.004	< 0.001	< 0.001	< 0.01	0.25	0.176