



FOURTH QUARTER 2011 MONITORING REPORT  
UIC PERMIT AZ396000001 AND APP PERMIT 101704  
FLORENCE COPPER PROJECT, FLORENCE, ARIZONA

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Curis Resources (Arizona) Inc.  
1575 W. Hunt Highway  
Florence, AZ 85132

January 30, 2012



January 30, 2012

Ms. Nancy Rumrill  
U.S. Environmental Protection Agency  
Region 9, Ground Water Office, WTR-9  
75 Hawthorne Street  
San Francisco, California 94105-3901

Subject: Fourth Quarter 2011 Monitoring Report  
Underground Injection Control (UIC) Permit Number AZ396000001

Dear Ms. Rumrill:

As you are aware, in February 2010, Curis Resources (Arizona) Inc. (Curis Arizona) purchased all of the assets of Florence Copper and the right to apply for the transfer of its permits to Curis Arizona, including the Aquifer Protection Permit (APP) and the UIC Permit. Curis Arizona submitted a UIC Permit application in March 2011 and, although the permit transfer is not complete, Curis Arizona is assuming the compliance obligations of those permits and is submitting this report in accordance with the reporting requirements of Parts II.G.2.(a) through (j) of the UIC Permit No. AZ396000001 issued by the United States Environmental Protection Agency (USEPA) on May 1, 1997. The Florence Copper Project is also subject to the requirements of APP No. 101704 issued by the Arizona Department of Environmental Quality (ADEQ) on June 9, 1997, and last amended on August 12, 2011.

This report pertains to monitoring activities conducted at the Florence Copper Project from October 1 through December 31, 2011. Copies of records required by Part II.G.1 are maintained at the mine site along with other information that is summarized below.

As you are aware, Florence Copper discontinued hydraulic control on September 1, 2004 in order to conduct groundwater quality tests in accordance with the APP and Part II.I.2 of the UIC Permit. A report of the results has been provided to ADEQ and USEPA for review. The recovery wells have remained off until a plan for further activity can be approved. As a result, no extraction flows or water levels are reported under Sections (b) and (c) below.

**(a) A map showing the current status of the mine.**

Figure 1 shows the current monitoring area including the Point of Compliance (POC) wells and the well field. Figure 2 shows the approximate layout of the well field and denotes the four well observation well/recovery well pairs.



There are four injection/recovery wells and nine original recovery wells. The four injection wells were later used as recovery wells during the rising of the mine block. Five observation wells were installed to demonstrate net inward hydraulic gradient for the 90 days required by the permit. Solution injection began on October 31, 1997 and ceased on February 8, 1998.

**(b) A table and graph showing daily cumulative injection flows and extraction flows in each active mine block over the reporting period.**

There are currently no active mine blocks. Hydraulic control for the test block was discontinued on September 1, 2004 for purposes of collecting groundwater samples following a 90-day period of no hydraulic control, and remains discontinued for evaluation of results. Accordingly there are no injection or extraction flows to report.

**(c) A table and graph comparing average daily head in the four observation wells surrounding each active mine block with that of the four adjacent extraction wells.**

There are currently no active mine blocks. Hydraulic control was not required during this reporting period for the test block and water level measurements are not required.

**(d) A table showing POC monitoring wells analytical results and Alert Levels.**

The POC Quarterly Compliance Monitoring Report is included as Attachment 1. The report summarizes the results of groundwater monitoring activities and includes tables of the field parameters and analytical results for the quarterly monitoring parameters. Brown and Caldwell, along with Project personnel, conducted compliance sampling November 28, 29, 30, and December 1 and 5, 2011. Monthly sampling of M1-GL was performed on October 31, November 29, and December 16, 2011 due to a verified exceedance of sulfate in the Third Quarter 2011.

Quarterly parameters were analyzed for 29 of the 31 POC monitoring wells. POC monitoring wells M32-UBF and M33-UBF were dry and could not be sampled. The three monthly results for sulfate in M1-GL exceeded the Alert Level (AL). No Aquifer Quality Limit (AQL) has been set for sulfate and there is no established maximum contaminant level (MCL). A report has been submitted demonstrating that the AL exceedance was likely not related to the permitted mining activities. No further action is anticipated. We have requested to continue monitoring of M1-GL on a quarterly basis.

There were three other AL exceedances of the quarterly parameters. Magnesium, sulfate, and total dissolved solids (TDS) exceeded the ALs in well P49-O. No AQLs have been set for the parameters and there is no established Aquifer Water Quality Standard (AWQS). Although not formally part of this quarterly monitoring report, the verification sampling in January of 2012 confirmed the exceedance. The ADEQ and USEPA were notified of the exceedances on January 23, 2012 with a demonstration that the exceedances are not likely related to the permitted mining activities. Although the monitoring

frequency of P49-O will be increased to monthly, we have requested to continue monitoring of P49-O on a quarterly basis.

It should be noted that M1-GL and P49-O are completed in a different aquifer zones and the elevated concentrations observed in these two POC wells are not believed to be related.

**(e) Results of the monthly analyses of organic in the injectate**

Organic analyses are not required because no solution was injected during the reporting period.

**(f) Results of monitoring required by 40 CFR 146.33 (b)(1)**

No solution was injected.

**(g) Results of the mechanical integrity tests**

No mechanical integrity test was conducted.

**(h) Results of the annular conductivity monitoring**

Although injection ceased in early 1998, annular conductivity measurements have continued to the present time. A graph showing measurement results for this reporting period is presented in Figure 3. No unusual conditions were noted.

**(i) Well and core hole plugging and abandonment.**

None of the existing wells or core holes were abandoned during the report period.

**(j) A summary of closure operations during the reporting period.**

There were no closure operations during the reporting period.

Ms. Nancy Rumrill  
January 30, 2012  
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Curis Arizona believes that you will find this report complete and in compliance with all permit conditions. Please contact me at (520) 374-3984 should you have any questions regarding this report.

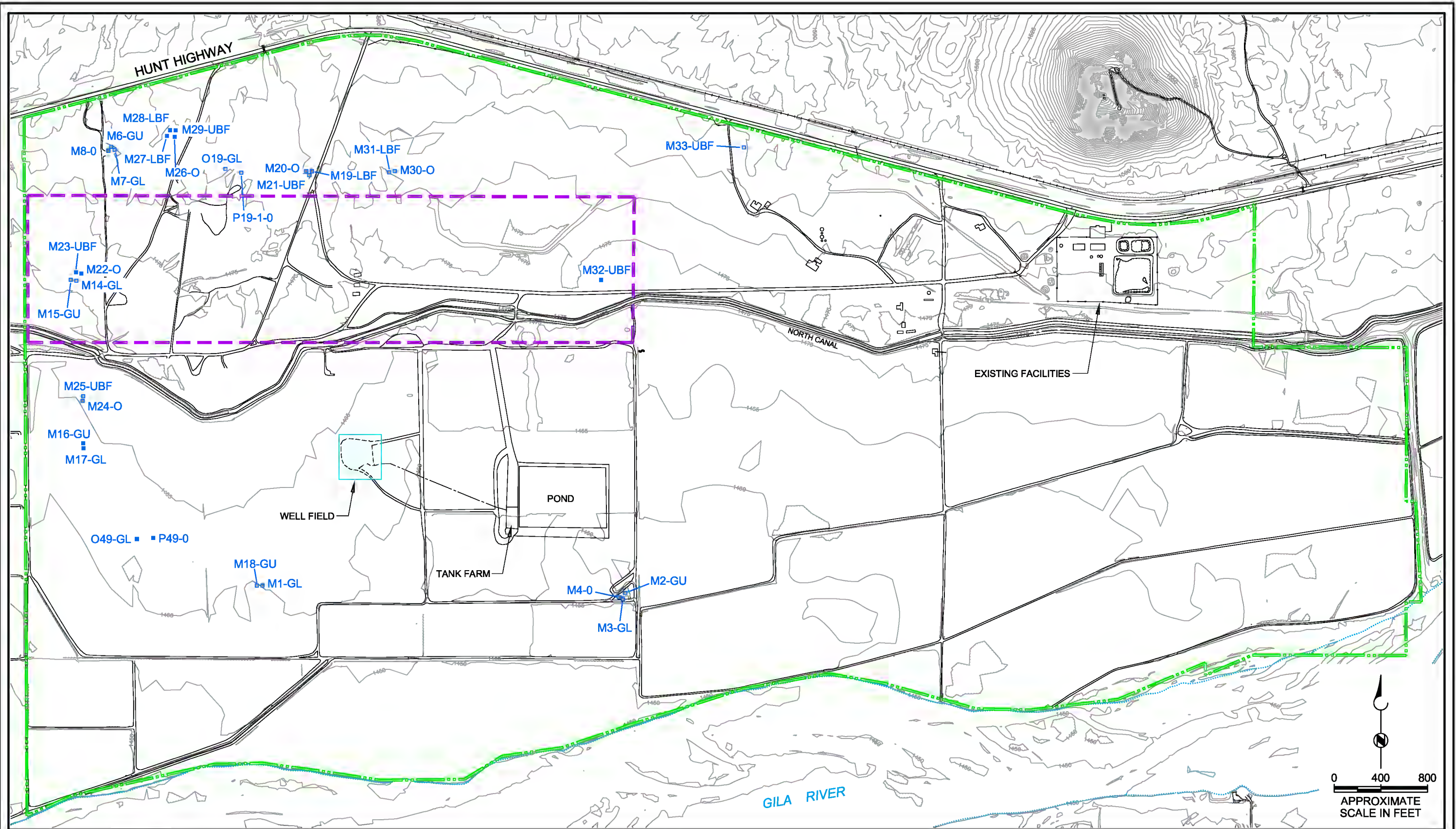
Sincerely,

A handwritten signature in blue ink, appearing to read 'D. Johnson', with a stylized flourish at the end.

Daniel Johnson  
CURIS RESOURCES (ARIZONA) INC.  
Environment and Technical Services Manager

BAS:ld  
Attachments  
cc: Florence Copper File



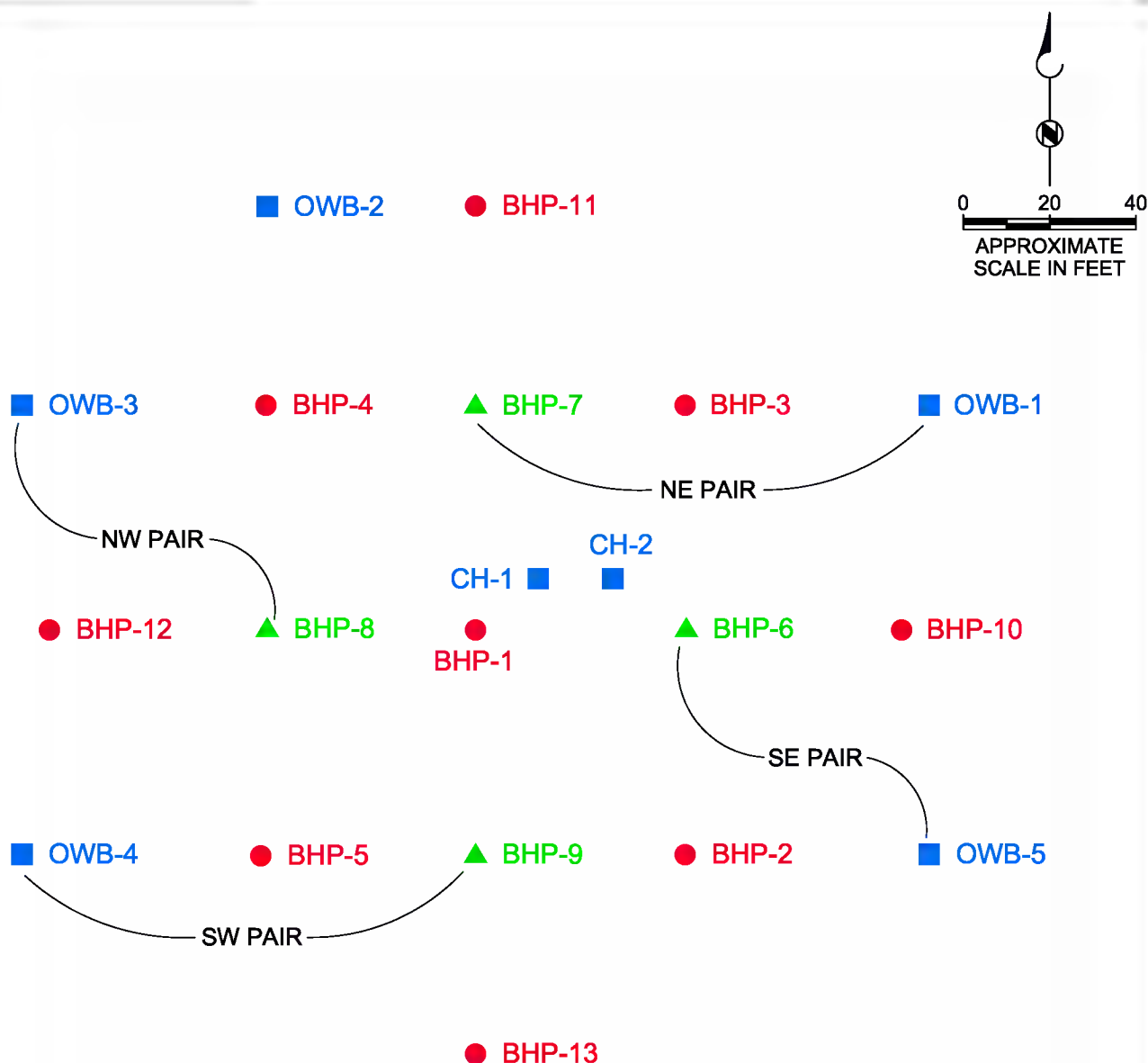


#### EXPLANATION

- APPROXIMATE PROPERTY BOUNDARY
- STATE LEASE LAND BOUNDARY
- M3-GL POC MONITORING WELL
- WELL FIELD DETAIL, FIGURE 2

**Brown AND  
Caldwell**

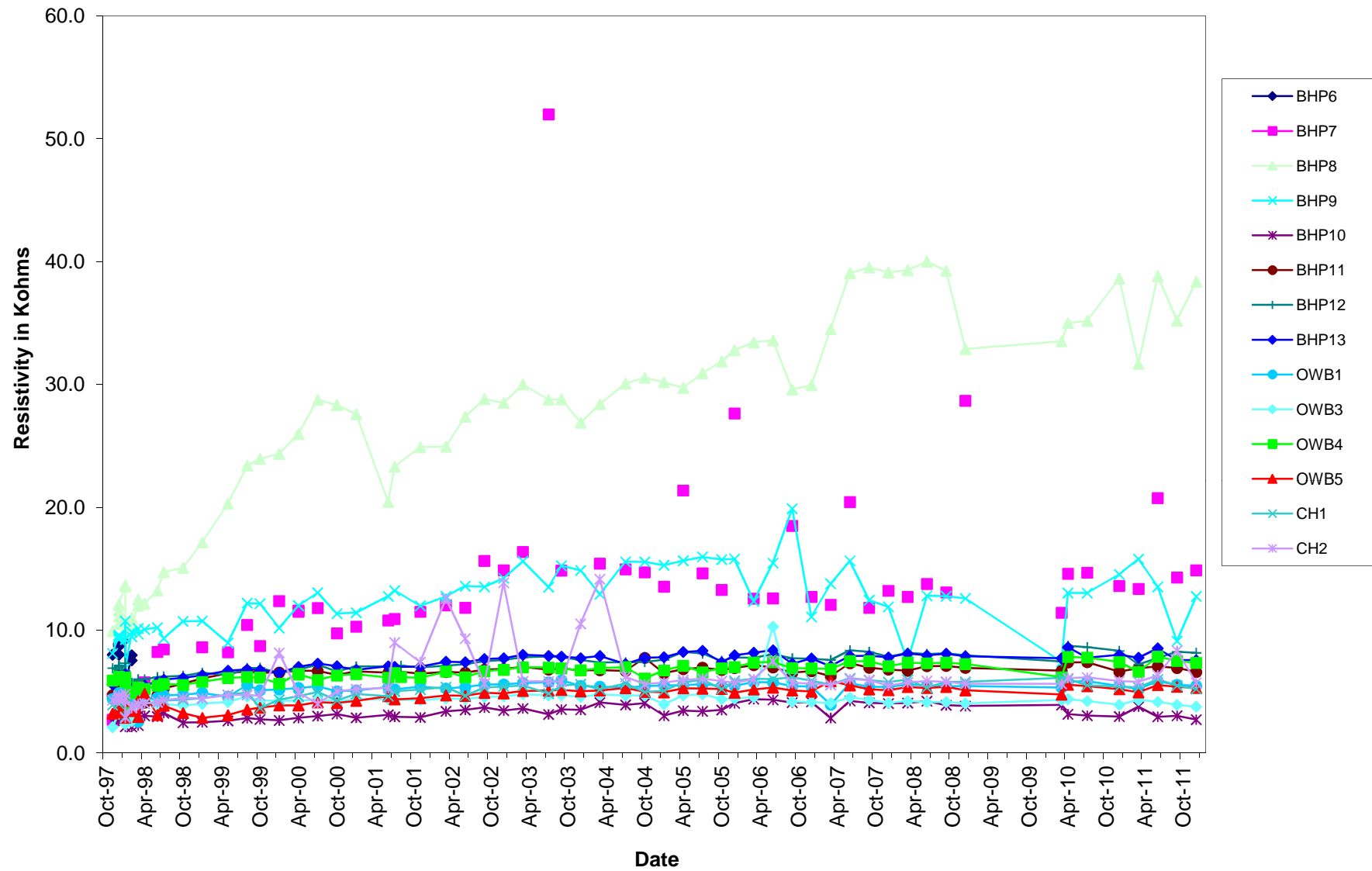
Figure 1  
**MONITORING AREA**  
FLORENCE COPPER PROJECT  
FLORENCE, ARIZONA



### EXPLANATION

- BHP-10 RECOVERY WELL (CURRENTLY INACTIVE)
- OWB-2 OBSERVATION WELL
- ▲ BHP-8 INJECTION / RECOVERY WELL  
(RECOVERY MODE SINCE 1998)

Figure 3 - Well Field Annular Resistivity





## ATTACHMENT 1

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### POC Quarterly Compliance Monitoring Report

FLORENCE COPPER PROJECT  
QUARTERLY COMPLIANCE MONITORING REPORT  
FOURTH QUARTER 2011



***Sampling Activities***

Quarterly compliance monitoring was conducted for the Florence Copper Project on November 28, 29, 30, and December 1 and 5, 2011. Monthly sampling of M1-GL was performed on October 31, November 29, and December 16, 2011 (Fourth Quarter 2011). Groundwater sampling and analysis was conducted in accordance with the requirements of Aquifer Protection Permit (APP) No. 101704, Section 2.5.3 (Groundwater Monitoring and Sampling Protocols) and Underground Injection Control (UIC) Permit No. AZ396000001 Part II.F.

Quarterly parameters, as listed in Section 4.0 Table 4.5 of the APP, were analyzed from the designated Point of Compliance (POC) wells. The quarterly analytical parameters are magnesium, sulfate, fluoride, and total dissolved solids (TDS) in addition to field pH, temperature, and specific conductance. The monthly samples were analyzed for the same parameters required by quarterly monitoring.

During the Fourth Quarter 2011 sampling event, 29 POC wells were sampled. Two POC wells (M32-UBF and M33-UBF) were dry and could not be sampled. One POC well, M1-GL was sampled monthly. Analyses of the samples were conducted by TestAmerica Laboratories (TestAmerica). Analytical results for the POC wells for the quarterly parameters are provided in Table 1 and field parameters measured during sampling are indicated in Table 2.

During the Fourth Quarter 2011, the Florence Copper Project continued to replace the stainless-steel pumps with low-flow bladder pumps. The pumps were replaced in wells M14-GL, M15-GU, M19-LBF, M21-UBF, M23-UBF, M25-UBF, M27-LBF, M28-LBF, M29-UBF, O19-GL, P19-1-O, and P49-O. Low-flow sampling was conducted in accordance with Section 2.5.3 (Groundwater Monitoring and Sampling Protocols). All remaining wells were purged a minimum of three borehole volumes. A reduced low-flow pumping volume was noted for M24-O due to an error; however, this did not appear to impact the results. No other reduced pumping volumes occurred and there were no modified sampling procedures noted.

Due to a verified exceedance of sulfate in the Third Quarter 2011, the monitoring frequency of M1-GL has been increased to monthly. The monthly sulfate concentrations in MW-1 were:

- October – 118 milligrams per liter (mg/L), above the Alert Level (AL) of 109 mg/L,
- November – 116 mg/L, and
- December – 115 mg/L.

No Aquifer Quality Limit (AQL) has been set for sulfate and there is no established Aquifer Water Quality Standard (AWQS). Concentrations of the other three indicator parameters remain well below ALs. A general increase in the sulfate concentrations in M1-GL has been observed from 2000 to 2010. The facility has been inactive since the pilot test in 1998, which was

performed in a very limited portion of the permitted area. M1-GL is an upgradient, background well to this pilot test area under prevailing conditions. The quarterly parameters were selected on the basis of theoretical impact by the in-situ process. All four parameters would be expected to increase significantly. Thus increased sulfate concentrations are not believed to be related to permitted mining operations. Monthly monitoring of the well will continue and no further action is anticipated.

The results of the remaining quarterly samples indicated three additional exceedances for one well. The results for P49-O were:

- Magnesium – 15 mg/L, above the AL of 6.2 mg/L,
- Sulfate – 1,280 mg/L, above the AL of 181 mg/L,
- TDS – 2,000 mg/L, above the AL of 801 mg/L, and
- Fluoride – < 0.4 mg/L, below the AL of 2.0 mg/L.

No other results exceeded established ALs.

The results were reported on December 21, 2011. A verification sample was collected on January 4, 2012. The confirmation results were reported on January 18, 2012. Although not formally part of this quarterly monitoring report, the results confirmed the exceedance. The Arizona Department of Environmental Quality (ADEQ) and U.S. Environmental Protection Agency (USEPA) were notified of the exceedances on January 23, 2011.

Under prevailing conditions, P49-O is a cross-gradient, background well to the pilot test area. Since the facility is inactive, the increased concentrations are not believed to be related to permitted mining operations. The remaining indicator parameter, fluoride, decreased significantly, which is counter-indicative of an impact.

For the December 2011 sampling event, the pump in P49-O was replaced with a low-flow bladder pump. The increases in concentrations in P49-O appear to be an effect of the low-flow sampling methodology. The low-flow pump may be collecting the water sample from a distinct portion of the aquifer zone with higher concentrations which become diluted performing a typical three borehole volume purge. The concentrations are in fact similar to the ranges observed in nearby well M24-O for pre-mining, ambient conditions. Since the observed changes in concentrations are not believed to be related to the permitted activities, we believe no further action is required.

It should be noted that M1-GL is completed in a different aquifer zone than P49-O and the elevated sulfate concentrations are not believed to be related to the changes in concentrations of P49-O.

In the POC network, a decreasing trend for magnesium concentrations and an increasing trend for fluoride concentrations were observed in the upper aquifer from 2000 to 2008, and stabilizing since 2008. Rising concentrations were also observed in upgradient wells M2-GU and M18-GU for magnesium, sulfate, and TDS from 2005 to 2007, and declining somewhat since 2008. Site-wide water levels have declined more than 50 feet in all three aquifer zones since the start of monitoring in 1996 to 2004, and have since been relatively stable or have recovered slightly.

Of the 18 wells with low-flow pumps, changes in water quality have been observed in wells M24-O, M26-O, and P49-O. Concentrations of the indicator parameters in M24-O increased an average of 5 percent to 45 percent; however, none of the results were above an AL. Concentrations in M26-O have decreased an average of 10 to 20 percent. Significant increases were observed in P49-O, discussed above, leading to exceedances of the ALs. As the facility has been inactive, these changes are not believed to be related to the permitted facility, but rather to the reduction of purge volumes.

### ***Contingency Sampling Plans***

Verification sampling of P49-O was performed on January 4, 2012. The exceedances were verified. The monitoring frequency will be increased to monthly. In the report submitted to the ADEQ and USEPA, we have requested to return to monitoring on a quarterly basis.

### ***Issues***

There were no other issues to report during the Fourth Quarter 2011.

Table 1. Summary of Analytical Results, Quarterly Parameters

Well ID	Sample Date	Magnesium		Sulfate		Fluoride		Total Dissolved Solids	
		Concentration	Alert Level	Concentration	Alert Level	Concentration	Alert Level	Concentration	Alert Level
M1-GL	Oct 31 2011	21.0	31	<b>118</b>	109	0.7	1.3	680	1028
M1-GL	Nov 29 2011	20.0	31	<b>116</b>	109	0.6	1.3	710	1028
M1-GL	Dec 16 2011	21.0	31	<b>115</b>	109	0.66	1.3	680	1028
M2-GU	Nov 29 2011	22.0	39	155	275	0.81	1.4	800	1496
M3-GL	Nov 29 2011	20.0	36	155	187	0.66	1.3	700	1157
M4-O	Nov 29 2011	4.1	15	59	405	2.4	5.1	400	1072
M6-GU	Nov 30 2011	2.5	5.1	56	86	0.62	1.3	370	620
M7-GL	Dec 01 2011	<0.2	1	38	82	0.84	1.7	290	464
M8-O	Dec 01 2011	<0.2	1	74	122	2.1	3.6	380	609
M14-GL	Nov 28 2011	2.2	23	66	144	0.57	1.4	460	874
M15-GU	Nov 28 2011	24.0	44	93	126	0.42	1.2	810	1359
M16-GU	Nov 30 2011	29.0	52	201	248	0.46	1.1	910	1635
M17-GL	Nov 30 2011	7.1	9.3	107	209	0.53	1.6	410	831
M18-GU	Nov 29 2011	21.0	36	178	288	0.83	1.6	830	1323
M19-LBF	Dec 05 2011	12.0	21	62	89	<0.4	1	440	794
M20-O	Dec 05 2011	6.1	14	60	112	0.68	1.7	400	809
M21-UBF	Dec 05 2011	20.0	87	154	487	0.77	1.1	780	2867
M22-O	Nov 28 2011	5.9	8.6	57	86	0.61	1.3	430	1094
M22-O (Dup)	Nov 28 2011	5.7	8.6	57	86	0.67	1.3	430	1094
M23-UBF	Nov 29 2011	30.0	69	252	411	0.69	1.3	1100	2392
M23-UBF (Dup)	Nov 29 2011	30.0	69	252	411	0.69	1.3	1100	2392
M24-O	Nov 30 2011	13.0	19	1110	1364	1.2	2.5	1700	2363
M25-UBF	Nov 30 2011	24.0	76	209	387	0.74	1.6	880	2683
M26-O	Dec 01 2011	<0.2	1	57	105	1.3	3.4	280	556
M27-LBF	Dec 01 2011	32.0	51	166	179	<0.4	1	1000	1745
M28-LBF	Dec 01 2011	1.1	2.6	41	81	0.6	1.6	350	610
M29-UBF	Dec 01 2011	25.0	84	206	465	0.6	1.1	920	2751
M30-O	Nov 28 2011	11.0	18	63	102	0.59	1.6	510	824
M31-LBF	Nov 28 2011	19.0	46	163	330	0.85	1.3	780	1665
O19-GL	Nov 30 2011	10.0	17	60	99	0.49	1.4	440	770
O19-GL (Dup)	Nov 30 2011	10.0	17	60	99	0.5	1.4	450	770
O49-GL	Dec 05 2011	9.1	18	74	159	0.41	1	500	849
P19-1-O	Nov 29 2011	5.5	12	69	107	1.6	2.8	480	767
P49-O	Dec 05 2011	<b>15.0</b>	6.2	<b>1280</b>	181	<0.4	2	<b>2000</b>	801
Arizona Aquifer Water Quality Standard									

All Results in Milligrams per Liter (mg/l)

&lt; = Less than the Laboratory Practical Quantitation Limit

Table 2. Summary of Quarterly Field Parameters

Well ID	Sample Date	Temperature (°C)	Temperature (°F)	pH	Conductivity (µmhos/cm)
M1-GL	Oct 31 2011	22.3	72.1	7.46	1134
M1-GL	Nov 29 2011	19.4	66.9	7.18	910
M1-GL	Dec 16 2011	20.7	69.3	7.18	950
M2-GU	Nov 29 2011	18.0	64.4	7.02	1039
M3-GL	Nov 29 2011	19.4	66.9	7.13	934
M4-O	Nov 29 2011	21.1	70.0	7.18	559
M6-GU	Nov 30 2011	21.4	70.6	7.16	570
M7-GL	Dec 01 2011	19.4	67.0	8.71	396
M8-O	Dec 01 2011	19.5	67.0	8.57	508
M14-GL	Nov 28 2011	21.0	69.8	8.37	664
M15-GU	Nov 28 2011	20.4	68.7	6.99	1114
M16-GU	Nov 30 2011	19.4	67.0	7.02	1226
M17-GL	Nov 30 2011	19.5	67.2	7.74	600
M18-GU	Nov 29 2011	18.0	64.3	6.94	1025
M19-LBF	Dec 05 2011	16.6	61.9	7.24	590
M20-O	Dec 05 2011	18.8	65.9	7.87	583
M21-UBF	Dec 05 2011	19.3	66.7	7.04	1049
M22-O	Nov 28 2011	25.0	77.1	7.68	672
M23-UBF	Nov 29 2011	19.3	66.7	6.83	1397
M24-O	Nov 30 2011	20.7	69.3	7.69	1829
M25-UBF	Nov 30 2011	19.8	67.7	6.99	1215
M26-O	Dec 01 2011	19.5	67.1	8.44	390
M27-LBF	Dec 01 2011	20.4	68.6	7.17	1389
M28-LBF	Dec 01 2011	19.6	67.2	8.41	530
M29-UBF	Dec 01 2011	19.6	67.2	6.87	1184
M30-O	Nov 28 2011	22.0	71.6	6.99	694
M31-LBF	Nov 28 2011	20.6	69.0	6.99	1047
O19-GL	Nov 30 2011	19.6	67.3	7.30	638
O49-GL	Dec 05 2011	23.5	74.3	7.54	787
P19-1-O	Nov 29 2011	20.1	68.1	7.81	602
P49-O	Dec 05 2011	17.0	62.6	7.05	1547

°C = Degrees Celcius

°F = Degrees Fahrenheit

µmhos/cm = Micromhos per Centimeter