



FIRST QUARTER 2014 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

April 30, 2014



**FLORENCE COPPER INC.**

1575 W. Hunt Highway, Florence, Arizona 85132 USA

[florencecopper.com](http://florencecopper.com)

April 30, 2014

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

Sent U.S. Certified Mail  
#7002 0860 0005 5148 1113  
Return Receipt Requested

Subject: First Quarter 2014 Monitoring Report  
Underground Injection Control (UIC) Permit Number AZ396000001

Dear Ms. Rumrill:

Florence Copper Inc. (formerly Curis Resources (Arizona) Inc.) 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 Aquifer Protection Permit (APP) No. 101704 issued by the Arizona Department of Environmental Quality (ADEQ) on June 9, 1997, and last amended on February 14, 2014.

This report pertains to monitoring activities conducted at the Florence Copper project from January 1 through March 31, 2014. 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 of the original pilot test facility 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 quarterly compliance sampling on February 3 through 7, 2014.

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.

POC well O49-GL was replaced by well O49-GL(R). Due to a verified exceedance, the monitoring frequency of O49-GL(R) has been increased to monthly. The monthly samples were analyzed for the same parameters required by quarterly monitoring. Monthly sampling of O49-GL(R) was performed on January 31, February 7 and March 11, 2014.

For the First Quarter 2014, one result exceeded the approved laboratory alert levels (ALs). Sulfate in upgradient well M1-GL was 113 milligrams per liter (mg/L), above the AL of 109 mg/L.

Sulfate has exceeded the AL in M1-GL since the Third Quarter of 2011. No AQL has been set for sulfate and there is no established AWQS. A report has been submitted demonstrating that the AL exceedance is not related to the permitted mining activities and routine quarterly monitoring for the well resumed during the Third Quarter 2012 event.

All monthly results for replacement well O49-GL(R) were below established alert levels. Routine quarterly monitoring will resume for the Second Quarter 2014 in accordance with the APP.

**(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 on 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.

Florence Copper 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,

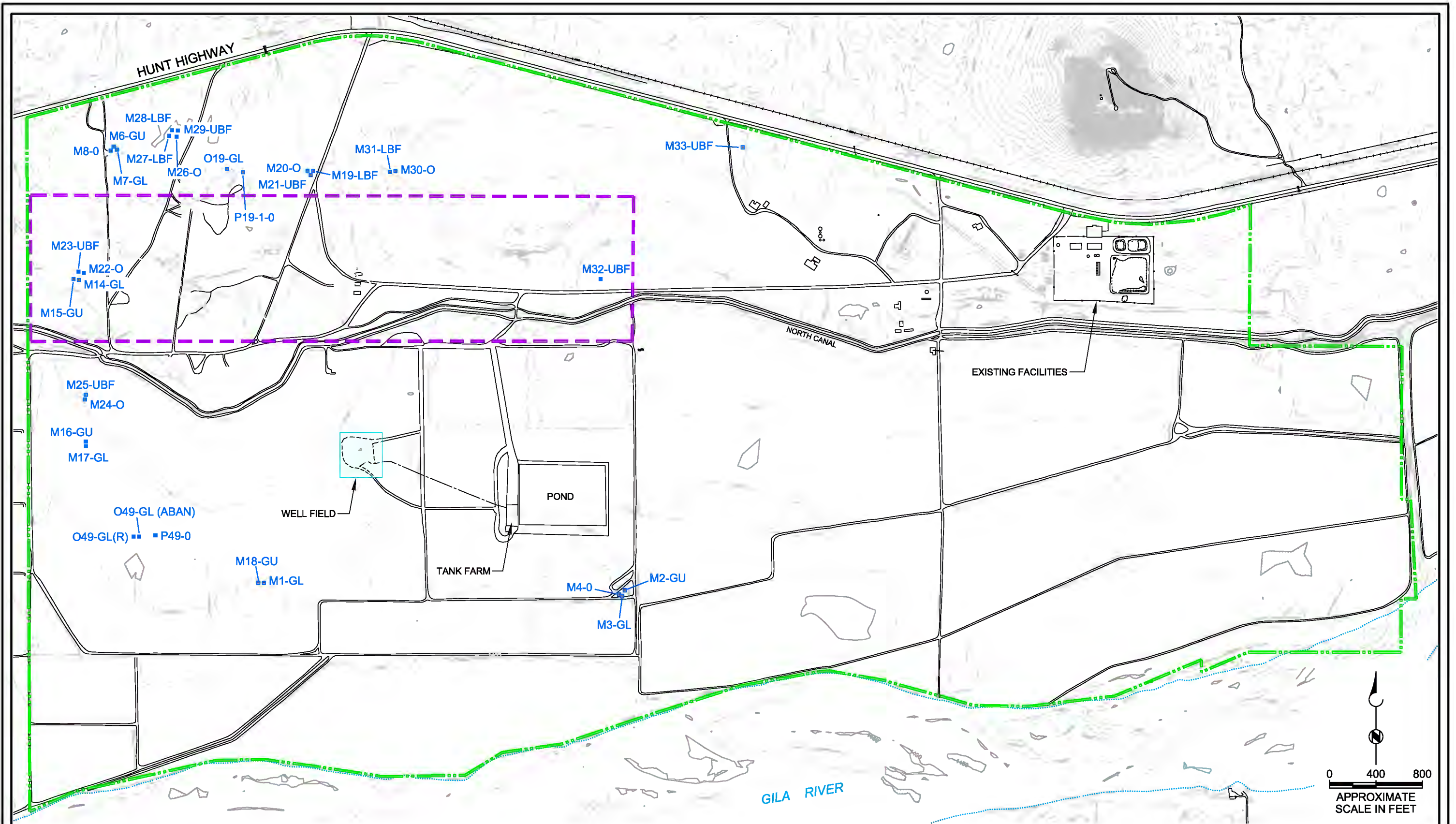
Florence Copper Inc.

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

Daniel Johnson  
Vice President Environment and Technical Services

BAS:cr

Attachments  
cc: Florence Copper File



#### EXPLANATION

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

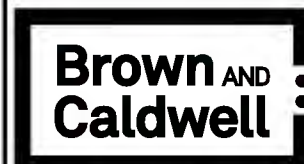
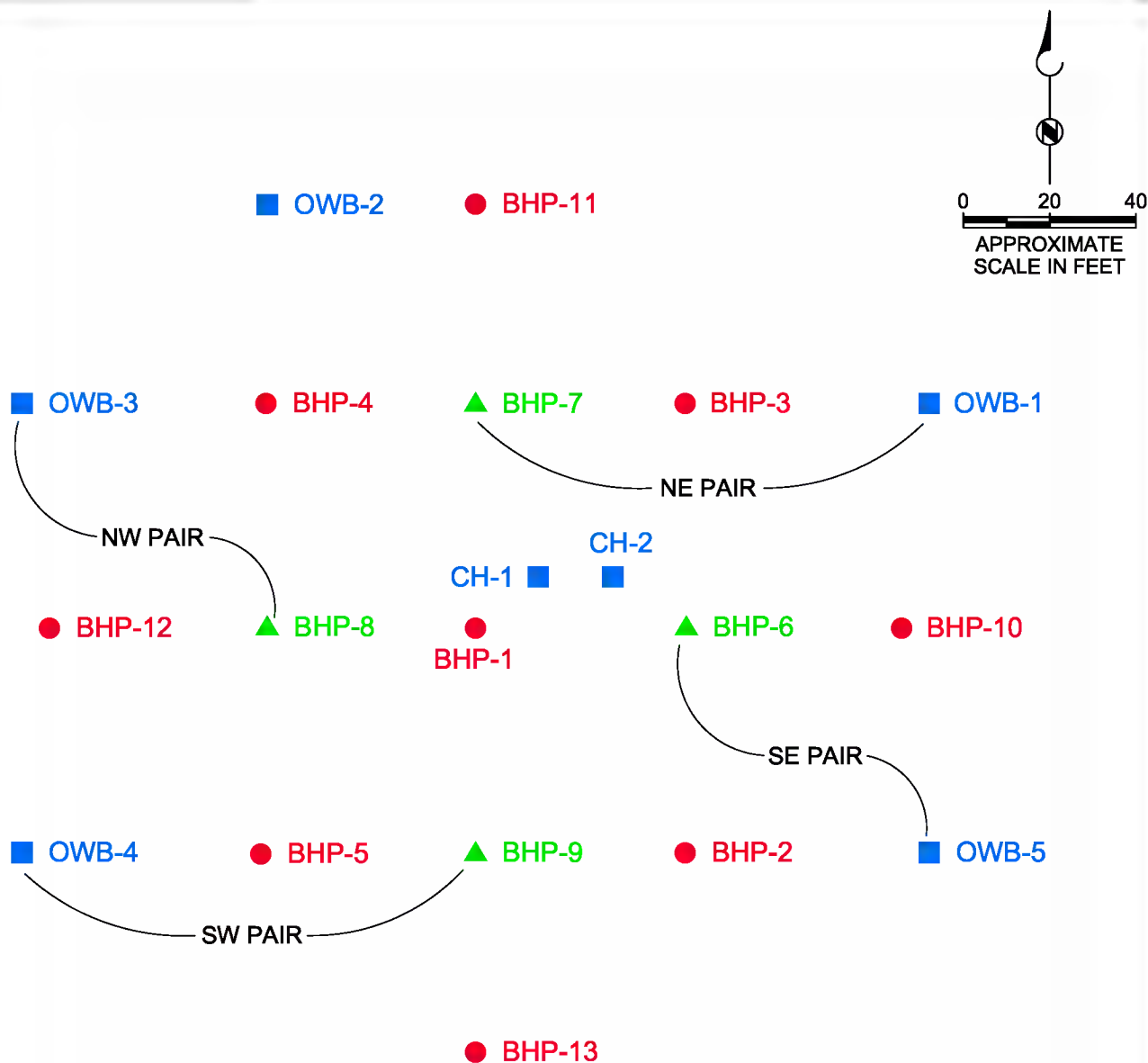


Figure 1  
**MONITORING AREA**  
 FLORENCE COPPER PROJECT  
 FLORENCE, ARIZONA

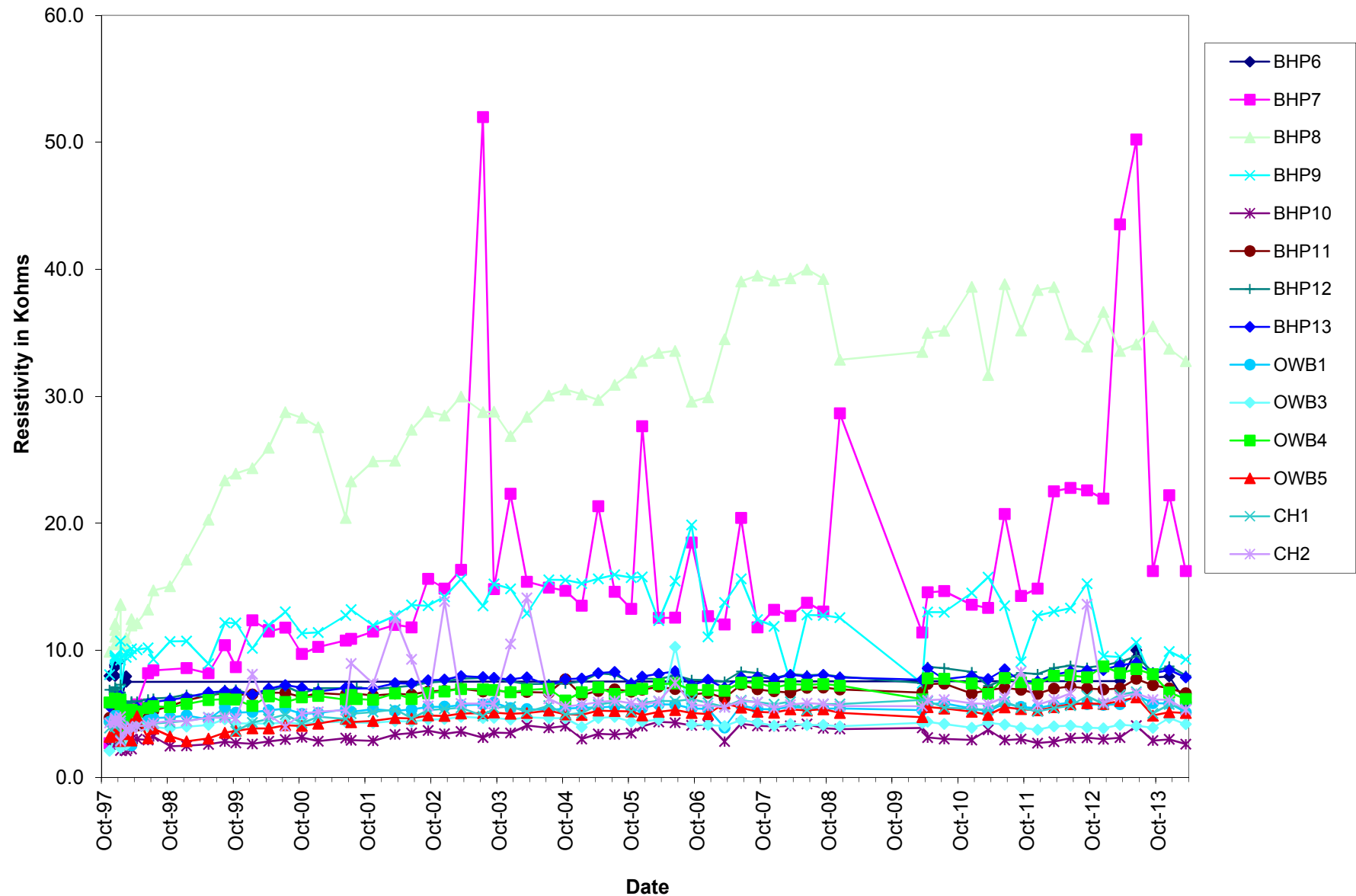


### EXPLANATION

- 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  
FIRST QUARTER 2014

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### Sampling Activities

Groundwater sampling at the Florence Copper Project site took place on February 3 through 7, 2014 (First Quarter 2014). Monthly samples of well 049-GL(R), the replacement well for 049-GL were collected on January 31, February 7 and March 11, 2014. 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 field parameters of dissolved oxygen (DO) and turbidity are also monitored to determine stabilization of wells sampled using low-flow purging methods, but are not reported. The monthly samples were analyzed for the same parameters required by quarterly monitoring.

During the First Quarter 2014 sampling event, 29 POC wells were sampled. Two POC wells (M32-UBF and M33-UBF) were dry and could not be sampled. Analyses of the samples were conducted by TestAmerica Laboratories - Phoenix (TestAmerica). Analytical results for the quarterly parameters are provided in Table 1, and field parameters measured during sampling are indicated in Table 2.

The majority of the monitoring well network is equipped with low-flow bladder pumps. Low-flow sampling was conducted in accordance with Section 2.5.3 (Groundwater Monitoring and Sampling Protocols). Wells M20-O, M22-O, M24-O, 049-GL(R) and P49-O are equipped with stainless-steel electric pumps. The wells were sampled by purging a minimum of three borehole volumes, except for M20-O which is purged dry for two consecutive days and allowed to recharge prior to sampling. No reduced pumping volumes occurred, and there were no other modified sampling procedures noted.

During the Third Quarter 2013, exceedances of the Alert Levels (ALs) for magnesium, sulfate, and TDS were observed in monitoring well 049-GL. The exceedances were verified during the Fourth Quarter 2013, and monthly monitoring was initiated. Under prevailing conditions, 049-GL is a cross-gradient, background well in relation to the BHP 1997-98 pilot test area. Because the BHP pilot test facility is inactive, and has not been active for a period of 15 years, and is located cross-gradient a distance of 1,800 feet from 049-GL, the increased concentrations are not indicated to be related to past permitted mining operations. It appears that a defect in the well casing or well construction allowed groundwater from the Upper Basin Fill Unit (UBFU) to leak downward either inside or outside of the well casing.

It was not possible to rehabilitate O49-GL and Florence Copper submitted an “Other” Amendment to ADEQ requesting permission to replace the well in accordance with Permit Section 2.5.3.1. The “Other” Amendment was approved on February 14, 2014 and replacement well, O49-GL(R) was installed. The well has been equipped with a stainless-steel electric pump. Monthly monitoring of O49-GL(R) has continued during the First Quarter 2014. All results of the January, February, and March 2014 events were below the ALs.

Permit Section 2.6.2.3.2.6 states that increased monitoring may be reduced to the regular frequency if the results of three consecutive monthly sampling events demonstrate that no parameters exceed the ALs. Accordingly, routine quarterly monitoring for O49-GL(R) will resume with the Second Quarter 2014 event.

Original well O49-GL has been abandoned, in accordance with Arizona Department of Water Resources (ADWR) rules, to prevent possible migration between the aquifer zones.

There were no exceedances of ALs in the monitoring network during the First Quarter 2014 sampling event, with the exception of sulfate in upgradient well M1-GL at 113 mg/L, above the AL of 109 mg/L.

Sulfate has exceeded the AL in M1-GL since the Third Quarter of 2011. No AQL has been set for sulfate and there is no established AWQS. A report has been submitted demonstrating that the AL exceedance is not related to the permitted mining activities and routine quarterly monitoring for the well resumed during the Third Quarter 2012 event.

As described above, a general increase in sulfate concentrations in M1-GL has been observed since 2000. A similar general increase has been observed in sulfate concentrations in M27-LBF since 2000; however there is no sulfate increase in nearby wells M28-LBF which is screened below M27-LBF, or M29-UBF which is screened above M27-LBF. Recently, concentrations of magnesium, sulfate, and TDS appear to be increasing in upgradient wells M2-GU, M3-GL, and M4-O. In the upper aquifer, a decreasing trend for magnesium concentrations and an increasing trend for fluoride concentrations were observed from 2000 to 2008, 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, 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, and have been relatively stable or have recovered slightly since 2004.

Of the 24 wells with low-flow pumps, some changes in water quality have been observed, since these pumps were installed between the Third Quarter 2011 and the First Quarter of 2012. Concentrations of the indicator parameters in M26-O, and M28-LFB have decreased on an average basis from 5 percent to 50 percent. Concentrations in M4-O have increased on an average basis from 20 percent to 80 percent. The changes of concentrations are likely related to the change of sampling methodology.

### Contingency Sampling Plans

Monthly monitoring of O49-GL(R) was conducted during the quarter and is complete. No contingency sampling plan is required for the Second Quarter of 2014.

**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	Feb 07 2014	20	31	113	109	0.6	1.3	704	1028
M1-GL (Dup)	Feb 07 2014	20	31	113	109	0.59	1.3	684	1028
M2-GU	Feb 06 2014	24	39	174	275	0.71	1.4	921	1496
M3-GL	Feb 06 2014	21	36	155	187	0.6	1.3	748	1157
M4-O	Feb 06 2014	6.4	15	77.0	405	2.32	5.1	509	1072
M6-GU	Feb 04 2014	2.6	5.1	53.7	86	0.56	1.3	387	620
M7-GL	Feb 05 2014	0.20	1	23.3	82	0.79	1.7	288	464
M8-O	Feb 05 2014	0.20	1	44.6	122	1.98	3.6	368	609
M14-GL	Feb 04 2014	2.3	23	59.8	144	0.54	1.4	434	874
M15-GU	Feb 04 2014	24	44	73.5	126	0.44	1.2	727	1359
M16-GU	Feb 07 2014	27	52	179	248	0.44	1.1	908	1635
M17-GL	Feb 07 2014	3.8	9.3	51.2	209	0.62	1.6	370	831
M18-GU	Feb 07 2014	20	36	158	288	0.76	1.6	824	1323
M19-LBF	Feb 03 2014	11	21	51.2	89	0.4	1	456	794
M20-O	Feb 05 2014	8.4	14	65.8	112	0.69	1.7	474	809
M21-UBF	Feb 03 2014	22	87	162	487	0.77	1.1	880	2867
M22-O	Feb 04 2014	6.2	8.6	54.3	86	0.62	1.3	444	1094
M23-UBF	Feb 04 2014	33	69	250	411	0.67	1.3	1200	2392
M24-O	Feb 03 2014	9.2	19	741	1364	0.98	2.5	1280	2363
M24-O (Dup)	Feb 03 2014	9.2	19	741	1364	0.99	2.5	1270	2363
M25-UBF	Feb 07 2014	37	76	258	387	0.49	1.6	1370	2683
M26-O	Feb 06 2014	0.20	1	55.1	105	1.23	3.4	293	556
M27-LBF	Feb 06 2014	31	51	143	179	0.4	1	1080	1745
M28-LBF	Feb 06 2014	0.74	2.6	10.7	81	0.62	1.6	333	610
M29-UBF	Feb 05 2014	32	84	235	465	0.59	1.1	1100	2751
M29-UBF (Dup)	Feb 05 2014	32	84	234	465	0.59	1.1	1100	2751
M30-O	Feb 03 2014	11	18	60.9	102	0.62	1.6	526	824
M31-LBF	Feb 03 2014	20	46	174	330	0.75	1.3	852	1665
O19-GL	Feb 03 2014	10	17	58.6	99	0.53	1.4	475	770
O49-GL(R)	Jan 31 2014	10	18	69.2	159	0.42	1	592	849
O49-GL(R)	Feb 07 2014	10	18	69.9	159	0.4	1	587	849
O49-GL(R)	Mar 11 2014	10	18	70.8	159	0.41	1	601	849
P19-1-O	Feb 03 2014	5.0	12	66.4	107	1.59	2.8	473	767
P49-O	Feb 04 2014	3.6	6.2	105	181	0.85	2	474	801
Arizona Aquifer Water Quality Standard		-		-		4		-	

All Results in Milligrams per Liter (mg/l)

< = 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	Feb 07 2014	20.2	68.4	7.36	1023
M2-GU	Feb 06 2014	19.8	67.7	7.24	1240
M3-GL	Feb 06 2014	20.3	68.5	7.34	1023
M4-O	Feb 06 2014	20.4	68.8	7.45	702
M6-GU	Feb 04 2014	22.5	72.5	7.82	780
M7-GL	Feb 05 2014	21.7	71.0	9.27	451
M8-O	Feb 05 2014	22.3	72.1	9.11	561
M14-GL	Feb 04 2014	22.3	72.2	8.15	896
M15-GU	Feb 04 2014	21.3	70.3	7.30	1331
M16-GU	Feb 07 2014	21.5	70.6	7.42	1410
M17-GL	Feb 07 2014	21.2	70.2	8.71	640
M18-GU	Feb 07 2014	20.4	68.8	7.22	1209
M19-LBF	Feb 03 2014	22.7	72.9	7.59	866
M20-O	Feb 05 2014	23.0	73.4	7.38	720
M21-UBF	Feb 03 2014	22.1	71.8	7.30	1470
M22-O	Feb 04 2014	25.7	78.3	7.78	970
M23-UBF	Feb 04 2014	22.1	71.7	6.97	2189
M24-O	Feb 03 2014	28.8	83.8	7.80	2189
M25-UBF	Feb 07 2014	21.4	70.4	7.05	1929
M26-O	Feb 06 2014	22.2	71.9	8.79	443
M27-LBF	Feb 06 2014	22.0	71.6	7.38	1472
M28-LBF	Feb 06 2014	22.5	72.5	9.04	554
M29-UBF	Feb 05 2014	21.9	71.3	7.11	1613
M30-O	Feb 03 2014	21.9	71.5	7.45	885
M31-LBF	Feb 03 2014	22.4	72.4	7.34	1456
M32-UBF	Feb 07 2014	NA	NA	NA	NA
M33-UBF	Feb 07 2014	NA	NA	NA	NA
O19-GL	Feb 03 2014	21.8	71.2	7.62	854
O49-GL(R)	Jan 31 2014	24.3	75.7	7.84	969
O49-GL(R)	Feb 07 2014	25.1	77.2	7.70	990
O49-GL(R)	Mar 11 2014	25.4	77.7	7.68	985
P19-1-O	Feb 03 2014	22.0	71.6	7.40	801
P49-O	Feb 04 2014	25.0	77.0	7.54	923

°C = Degrees Celcius

°F = Degrees Fahrenheit

µmhos/cm = Micromhos per Centimeter

