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Florence Copper Project

NI 43-101 Technical Report
Pre-Feasibility Study

Florence, Pinal County, Arizona

REVISION 0

Prepared For:

HDI CURIS

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Qualified Persons:

Richard Zimmerman, R.G., SME-RM

Michael R. Young, SME-RM

Corolla Hoag, C.P.G., SME-RM

Terence P. McNulty, P.E., SME-RM

Dennis Tucker, P.E.

Richard Frechette, P.E.

DATE AND SIGNATURES PAGE

This report is current as of 28 March 2013. Certificates of Qualified Persons are included as Appendix A.

Signature	Date
"Richard Zimmerman, R.G., SME-RM"	28 March 2013
"Michael R. Young, SME-RM"	28 March 2013
"Corolla Hoag, C.P.G., SME-RM"	28 March 2013
"Terence P. McNulty, P.E., SME-RM"	28 March 2013
"Dennis Tucker, P.E."	28 March 2013
"Richard Frechette, P.E."	28 March 2013

FLORENCE COPPER PROJECT
FORM 43-101F1 TECHNICAL REPORT
PRE-FEASIBILITY STUDY

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1 EXECUTIVE SUMMARY

1.1 PROJECT OVERVIEW – KEY DATA AND RESULTS

The Florence Copper Project ("the FCP" or "the Project") is an advanced-stage oxide copper project located in central Arizona and controlled 100 percent by Curis Resources Ltd. ("Curis"). The Project is a shallowly buried porphyry copper deposit that is amenable to in-situ copper recovery ("ISCR") and solvent extraction-electrowinning ("SX/EW") copper production. The property, including surface and subsurface rights, consists of private patented land totaling approximately 1,182 acres and a leased parcel of Arizona State Land of approximately 159.5 acres in size. M3 Engineering & Technology Corporation ("M3") was commissioned by Curis Resources (Arizona) Inc. ("Curis Arizona"), a wholly owned subsidiary of Curis, with other specialist consultants to prepare a Pre-Feasibility Study of the Project and a technical report that is compliant with the Canadian Securities Administrators ("CSA") National Instrument 43-101F1 ("NI 43-101") (CSA, 2011). As primary author of this Pre-Feasibility Study, M3 was integral to development and engineering of copper extraction and processing facilities as well as capital and operating cost estimates for the Florence Copper Project. The key data and results of this Pre-Feasibility Study at a $2.75 long term copper price are described below. All currency is in US dollars.

- The economic analysis before taxes indicates an Internal Rate of Return (IRR) of 36% and a payback period of 2.6 years. The Net Present Value ("NPV") before taxes is $727 million at a 7.5% discount rate.

- The economic analysis after taxes indicates that the project has an IRR of 29% with a payback period of 3.0 years. The NPV after taxes is $503 million at a 7.5% discount rate.

- The estimated initial capital cost is $189 million (plus $19 million of pre-production costs). Sustaining capital items include construction of additional water impoundments and ISCR wells, expansion of the water treatment plant, and replacement of capital equipment, and are estimated to be $627 million for a total life of operation capital cost of $835 million.

- Direct operating costs are estimated at $0.80/lb-Cu.

- The table below shows a breakdown of the life of operation total, operating costs, and cash costs per lb of copper.

Operating Cost	Cost	$/lb. Cu*
Well field	$580,000,000	$0.34
SX-EW Plant	$417,000,000	$0.25
Water Treatment	$150,000,000	$0.09
General Administration	$208,000,000	$0.12
Total Operating Cash Cost	**$1,354,000,000**	**$0.80**
Royalties, Incidental Taxes (excludes Income Taxes), Reclamation, and Misc.	$524,000,000	$0.31
Total Cash Cost	**$1,878,000,000**	**$1.11**

*Note: Any summation discrepancies are due to rounding.

- The probable mineral reserves at a 0.05% Total Copper ("TCu") cutoff are as follows:

Tons	339,953,000
TCu Grade (%)	0.358
Contained Copper lb	2,435,400,000
Average Recovery (%)	69.7
Extracted Copper Pounds	1,698,000,000

Notes:
1. *Reserves are stated within the economic resource boundary depicted in Figure 15-1. There are no Proven reserves. Measured and Indicated resources were converted to Probable reserves.*
2. *Approximately 3 million pounds of the probable reserves are expected to be recovered from Phase 1 production testing prior to the operation of the commercial plant envisaged in this study.*

- Anticipated economic benefits to the community in terms of employment, personal income and tax revenue are as follows:

Impact Locus	Total Impact	Annual Average Impact
Gross State Product		
Arizona	$2,245,000,000	$80,000,000
Pinal County	$1,078,000,000	$39,000,000
Employment (Jobs)		
Arizona	-	681
Pinal County	-	406
Personal Income		
Arizona	$1,464,000,000	$52,000,000
Pinal County	$709,000,000	$25,000,000
State Revenues		
Arizona	$204,000,000	$7,000,000
Pinal County	$190,000,000	$7,000,000

Note: dollar values are constant 2011 dollars
Source: REMI model of Arizona and Pinal County economies

- Curis Arizona continues to work with the local and state authorities to advance the project.

1.2 INTRODUCTION

M3 and other specialist consultants were commissioned by Curis Arizona to prepare a Pre-Feasibility Study and technical report of the FCP that is compliant with NI 43-101. As primary author of this Pre-Feasibility Study, M3 was integral to development and engineering of copper extraction and processing facilities as well as capital and operating cost estimates for the FCP. The intent of this report is to provide the reader with a comprehensive review of the potential economics of this mining operation and related project activities, and to provide recommendations for future work programs to advance the Project.

The following other consultants have participated in work that supports the Pre-Feasibility Study: TP McNulty and Associates ("McNulty"), Haley & Aldrich, SRK Consulting USA, Inc. ("SRK"), ARCADIS U.S., Inc. ("ARCADIS") and Knight Piésold ("KP").

1.3 RELIANCE ON OTHER EXPERTS

In some cases, the authors have relied upon the work of others to describe the current status of the property and to provide the basis for cost estimates for significant components of the life-of-operations economic model. In the opinion of the authors, the Florence historical data, in conjunction with borehole assays conducted by Curis Arizona, are present in sufficient detail to prepare this report and are generally correlative, credible, and verifiable.

1.4 PROPERTY DESCRIPTION AND LOCATION

The FCP is located in Pinal County, Arizona. The property, including surface and subsurface rights, consists of private patented land totaling approximately 1,182 acres and a leased parcel of Arizona State Land of approximately 159.5 acres in size. The approximate latitude and longitude of the planned In-Situ Copper Recovery ("ISCR") area are 33° 02' 49.07" North and 111° 25' 47.84" West.

Curis Arizona owns 1,181.59 acres of surface and subsurface rights, including mineral rights, of patented land held in fee simple. This private property falls within the boundaries of the Town of Florence. Curis Arizona also leases under Arizona State Mineral Lease 11-26500 approximately 159.5 acres of surface and mineral rights on Arizona State Trust Lands, which is not subject to the jurisdiction of the Town of Florence. The State Trust Land overlies approximately 42% of the copper resource. In addition, Curis holds water rights for both pieces of land as described in Section 4.7.5. The site location is shown in Figure 1-1 and Figure 1-2.

1.5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

The project site is located in south-central Arizona, in the Sonoran Desert of the Basin and Range Lowlands physiographic province. The project area lies approximately one-half mile north of the Gila River, at an approximate elevation of 1,480 feet amsl. The river is dry much of the year and flows east to west in response to regional precipitation events. The project site is adjacent to Hunt Highway and is easily accessible by paved roads. The Town of Florence is located at the junction of AZ-287 and AZ-79, approximately 3.5 miles by highway from the FCP.

The topography of the site is a gently sloping (southward) alluvial surface, historically used as farmland. Typical Sonoran Desert vegetation present on the site consists of short trees, 10 to 30 feet tall, and shrubs. Vegetation in the Florence area is sparse, mainly consisting of creosote.

Local infrastructure and vendor resources to support exploration, development, and mining are in place. Exploration and mining service companies for the metals/non-metals, coal, oil, and gas industries are located in Phoenix and Tucson, and at a greater distance, in Albuquerque, New Mexico and Denver, Colorado. Locally available resources and infrastructure include power, water, communications, sewage and waste disposal, security, rail transportation, and a skilled and unskilled work force.

An administration building, currently used by the project development personnel, is present at the site; the structure can be used for administration when the property goes into production. Landline telephone, cellular telephone, and internet services are available at the project site. The Copper Basin Railway, a federally regulated shortline railroad located 100 feet north of Hunt Highway and adjacent to the project site, provides rail access between the town of Winkelman and the Union Pacific Railroad connection at the Magma loading station near I-10. There is a siding approximately one mile east of the property that could be used to ship and take deliveries.

Power is provided directly to the project site by the San Carlos Irrigation Project. Arizona Public Service (“APS”) and Salt River Project have power lines that cross the property and APS is in the process of bringing power to a substation location on the State Land portion of the project that will be able to serve the electrical demand of the project. Natural gas is available from Southwest Gas approximately 1.6 miles east of the site. Water is available from existing wells on the site for process uses. The site presently has trash pick-up and has existing septic systems for sanitary wastes. Manpower resources are readily available as Southern and Central Arizona is an area with a long history of mining-related construction, copper mining, heap and in-place leaching, and processing with long-established vendor-support services.

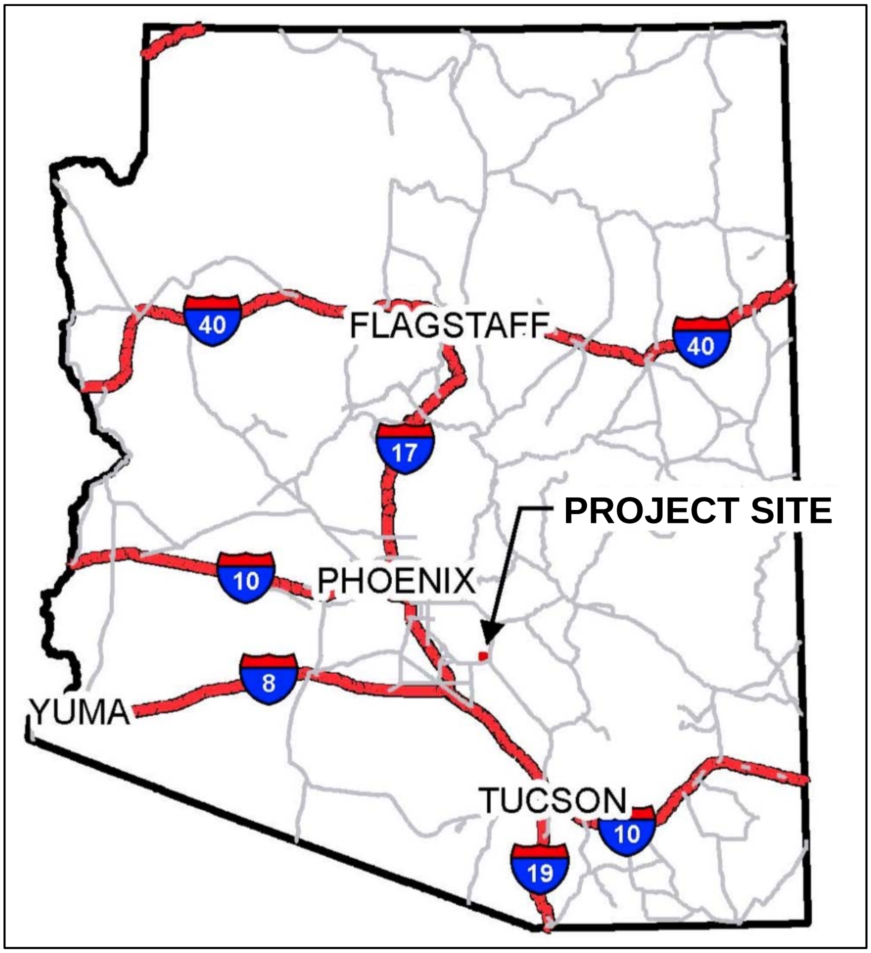


Figure 1-1: Regional Location Map

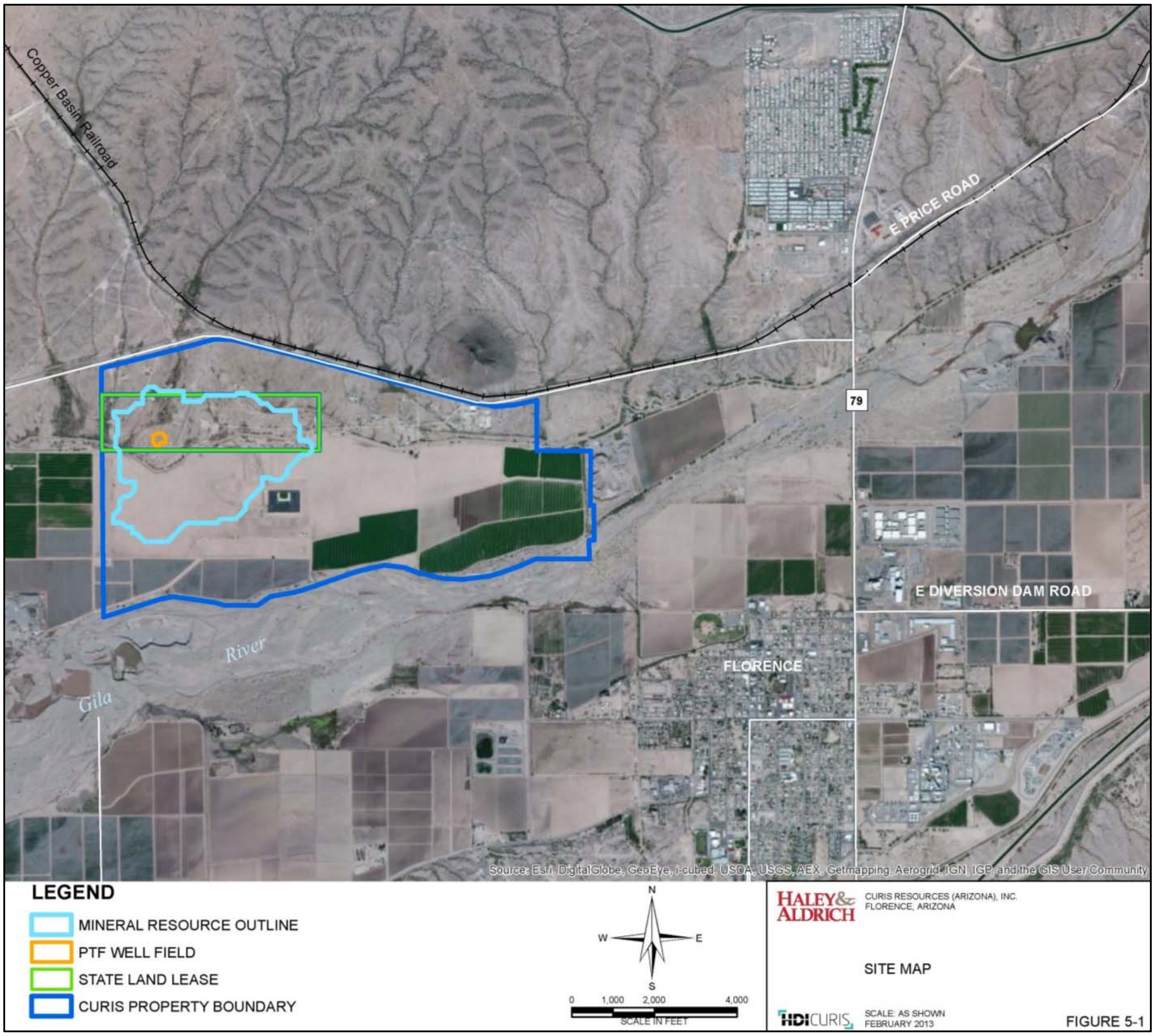


Figure 1-2: Florence Site Location Map

Note: PTF is an abbreviation for "Production Test Facility"

1.6 HISTORY

The project has had three previous owners whose primary business is exploration and mining development including Continental Oil Company ("Conoco"), Magma Copper Company ("Magma"), and BHP Copper Inc. ("BHP"). BHP conveyed the land constituting the FCP site to Florence Copper Inc. on May 26, 2000. Florence Copper Inc. was then sold to Merrill Mining LLC of Atlanta, Georgia, effective on December 5, 2001. The patented land owned by Florence Copper, Inc., including land forming part of the FCP, was acquired in July 2004 by Roadrunner Resorts, LLC, and in January 2006 by WHM Merrill Ranch Investments, LLC. On March 10, 2009, the patented land was conveyed in foreclosure proceedings to The Peoples Bank. On October 28, 2009, Merrill Ranch Properties, LLC acquired the patented land from The Peoples Bank. On December 17, 2009, Curis Arizona purchased the surface rights and all of the mineral rights to the patented land constituting the FCP from Merrill Ranch Properties, LLC. On January 8, 2008, Felix-Hunt Highway, LLC acquired Florence Copper, Inc., the lessee under the Arizona State Mineral Lease 11-26500. On February 24, 2010, Curis Arizona obtained assignment of Arizona State Mineral Lease 11-26500. There has been no commercial production of copper from the FCP site historically.

Conoco discovered the Florence copper deposit in 1970 while executing an exploratory drilling program southwest of Poston Butte. In 1974, Conoco sunk a shaft and mined over 50,000 tons of mineralized quartz monzonite from a single-level, underground mine designed for metallurgical and geological testing. Metallurgical testing of the recovered material was performed using a small pilot plant built on the property. The pilot mine shafts are now capped at the ground surface and the mine is flooded.

Magma acquired the property from Conoco in July 1992 for $9 million and initiated a Pre-Feasibility Study in January 1993 to verify the Conoco work and to determine the most effective technology for extracting copper from the deposit. The results from copper resource modeling, metallurgical testing, material property testing, and financial analysis supported the conclusion that the application of in-situ leaching and solvent extraction/electrowinning ("SX/EW") to produce cathode copper was the preferred method to develop the Florence deposit.

In January 1996, Broken Hill Proprietary Company Limited of Australia acquired Magma and created BHP. The prefeasibility process started by Magma in January 1995 continued through the acquisition phase. In 1998, BHP conducted a multi-month, field optimization ISCR test to demonstrate hydraulic control, gather copper recovery and other technical data for final feasibility. The outcome of the study confirmed to regulatory agencies that production wells could be efficiently installed into the mineralized zone, hydraulic control of the injected and process solutions could be maintained and documented, and that the ISCR method was a viable method for copper extraction.

1.7 GEOLOGICAL SETTING AND MINERALIZATION

The Florence deposit formed approximately 62 million years ago ("Ma") when numerous dike swarms of Laramide granodiorite porphyry intruded Precambrian quartz monzonite near Poston Butte. The dike swarms were fed at depth by a large intrusive mass. Hydrothermal solutions associated with the intrusive dikes altered the host rock and deposited copper and iron sulfide minerals in disseminations and thin veinlets in the strongly faulted and fractured rocks. Hydrothermal alteration and copper mineralization is most intense along the edges and flanks of the dike swarms and intrusive mass (BHP, 1997a; SRK, 2010).

Mid-Tertiary Basin and Range extensional faults subsequently elevated and isolated much of the Florence deposit as a horst block. The horst block and the downthrown fault blocks were exposed to weathering and erosion. The center of the deposit was eventually eroded to a gently undulating surface. Coarse, poorly bedded conglomerate from the surrounding mountains filled the basin west of the Florence deposit and began to cover the eroded top of the horst block. River sand, silt, and gravel buried the entire deposit to a depth of approximately 425 feet. During this period of erosion and deposition, calcareous silty mud and clay layers were deposited in shallow basins that extended over the region. This 20-40 feet thick clay layer, which occurs approximately 60 to 100 feet above the top of bedrock acts as an aquitard beneath the FCP property that retards mixing of groundwater from the two water-bearing zones above and below this layer. This condition is validated by water level information collected as part of the 16-year regulatory compliance monitoring program.

The main sulfide minerals are chalcopyrite, pyrite, and molybdenite with minor chalcocite and covellite. Molybdenite occurs as discrete grains or as a film on fracture surfaces; the average molybdenum grade is 0.008%. Pyrite is usually subordinate to chalcopyrite (ratios of 1:1 to 1:3), and both are found in veinlets and as disseminated grains; they commonly occur in quartz ± biotite veins rimmed by orthoclase and sericite. Supergene chalcocite coats pyrite and chalcocite and dusts fracture surfaces. The supergene chalcocite blanket is very thin and irregular (zero to 50 feet); in most instances, the transition from the leachable copper silicates and oxides to the sulfide zone (relatively non-leachable) is quite abrupt.

Mineralization in the oxide zone consists primarily of chrysocolla with lesser “copper wad,” tenorite, cuprite, native copper, and trace azurite and brochantite. The majority of the copper occurs as chrysocolla in veins and fracture fillings, while the remainder occurs as copper-bearing clays in fracture fillings and former plagioclase sites. The thickness of the oxidized zone ranges from 40 to 1,000 feet with an average thickness of 400 feet.

A calculation of the total copper (“TCu”) grade by oxidation type for all assays within the Florence drill hole database shows that the oxide mineralization is similar, but enriched, relative to that of the primary sulfide mineralization. The overall average grade of the oxide and sulfide mineralization is approximately 0.356% TCu and 0.268% TCu, respectively. Copper mineralization is enriched in quartz monzonite host rock, relative to the intrusive granodiorite porphyry dikes (average grade of 0.38% TCu versus 0.27% TCu).

1.8 DEPOSIT TYPES

The Florence copper deposit is an extensive Laramide type of porphyry copper deposit consisting of a large core of copper sulfide mineralization lying beneath a zone of copper oxide mineralization. The central portion of the deposit is overlain by approximately 375 to 425 feet of flat-lying conglomerate and alluvial material that contains a fine-grained silt and clay interbeds (Figure 1-3). The oxide and sulfide zones are separated by a transition zone ranging from 0 to 55 feet in thickness.

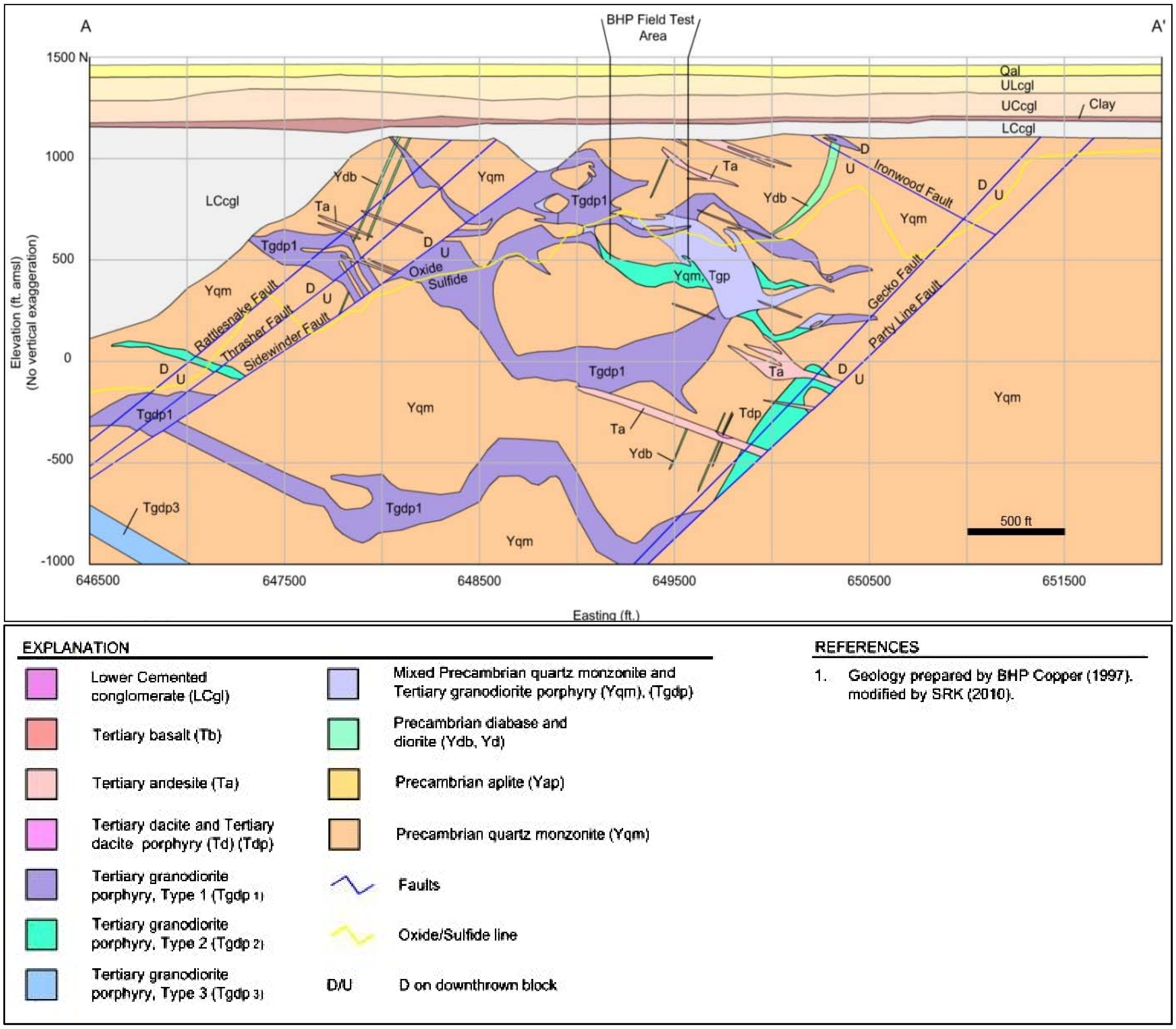


Figure 1-3: East-west Geology Cross Section at 744870N Looking North (SRK, 2010)

1.9 EXPLORATION

The previous owners undertook substantial exploration work including drilling (exploration, assessment, condemnation, geotechnical, and environmental), underground mine development, geophysical surveys, and mineralogy studies. Since acquiring the project in 2009, Curis' focus has been to re-assess and build on the potential for ISCR production at the FCP pursuing environmental baseline, hydrologic modeling, engineering studies, and community related activities. The company commissioned a preliminary economic assessment ("PEA") by SRK in 2010. Based on the positive results of the PEA, as well as other available data, Curis initiated programs necessary to advance the project. This work has included drilling to obtain samples for metallurgical testing, engineering studies to support planning for a Phase 1 Production Test Facility ("PTF") and a Phase 2 expansion that would take the project to commercial production, as well as updating and amending operating permits to support development.

1.10 DRILLING

Drilling on the FCP site has been undertaken by means of core drilling, RC rotary drilling, and conventional rotary drilling. Conoco developed a detailed geologic core logging protocol in the early to mid-1970s. With slight modifications, Magma, BHP, and Curis Arizona geologists have continued to use this method to maintain compatibility with the geologic data produced by Conoco. Drilling performed on the property is summarized in Table 1-1.

Table 1-1: Drilling Footage by Company as of August 2011

Company	# of Holes	Footage
Curis Resources (2011)	6	7,752
BHP Copper (1997)	21	16,638
Magma Copper Company (1994-1996)	173	146,891
Conoco (1970-1977)	612	620,483
Other	5	3,716
Total	**817**	**795,480**

Source: Compiled by SRK, 2011. SRK has documented the location of 612 Conoco holes in the project database, but 686 were drilled by Conoco through 1977 within a 6-mile radius. An additional 74 shallow assessment holes drilled in distant sections are not included in the project database.

1.11 SAMPLE PREPARATION, ANALYSES AND SECURITY

Sampling protocols were developed by previous owners to ensure consistency and mitigate bias. Sampling consisted of core sample and cuttings from drilling, as well as bulk samples obtained by the underground working. Conventional rotary and/or reverse circulation ("RC") drill cuttings were typically collected every 10 feet by Conoco, Magma, and BHP. Samples drilled by RC methods were sent for assay. Conventional rotary cuttings were assayed by Conoco but the information was considered unreliable and used by BHP only for geological control.

Core samples provide the most detailed information. BHP sample-handling protocols used during core handling were based on protocols used by Conoco and Magma with the goal of providing representative, unbiased samples of the mineralized materials encountered in the borehole.

Sample preparation protocols for the 2011 Curis Arizona metallurgical and confirmation drilling program were outlined in the *Curis 2011 Drill Program Operation Manual* (Titley, Yang, and Hoag, 2011). The procedures were similar to those used by previous operators but differed in that the core was treated differently depending on the core diameter and purpose.

Assays of drill samples were conducted by various laboratories under the supervision of Arizona-registered assayers and laboratory managers. Results from most of these assays are present in the geology log files, which are now in Curis Arizona's possession. The "San Manuel Method" was consistently used by Magma, BHP, and outside laboratories contracted by

Magma/BHP for the analysis of percent acid-soluble copper (% ASCu) content in the Florence drill and metallurgical test samples (Section 11.2.2).

In SRK's opinion, the historical and current sample preparation procedures, analyses performed, and the sample security in place for rock, groundwater quality, and process solution samples followed industry standard procedures then and now, and are sufficient to support the project information database.

1.12 DATA VERIFICATION

Data verification has been performed by each company conducting exploration and development at the FCP site, as described in detail in Section 12. During site visits in 2010 and 2011, SRK verified that historical and current drill core and pulps stored at the FCP site are generally dry and free of animal or moisture damage and are available for verification sampling. An extensive data verification program of the drill logs, assay receipts, and database was not deemed necessary by SRK. One Qualified Person for this report (C. Hoag of SRK) is personally familiar with the data entry and database verification programs; sampling, data entry, and quality assurance/quality control protocols; and the reanalysis programs undertaken by both Magma and BHP during five years of work on the project.

Analytical results from the 2011 Curis Arizona metallurgical and confirmation drilling program indicated copper concentrations similar to those collected from prior drilling programs performed in the same areas.

SRK concludes that Curis Arizona and previous owners followed industry standard QA/QC protocols related to sample collection and data verification. Curis Arizona has generated a project database of information that is verifiable and supports the mineral resource statement and Pre-Feasibility Study conclusions presented in this report. The drill hole database, including assays and other information, is of high quality and have been sufficiently verified.

1.13 MINERAL PROCESSING AND METALLURGICAL TESTING

Conoco, Magma, and BHP conducted numerous mineralogy, bottle roll, column leach tests, and chrysocolla dissolution studies, which are briefly summarized below (Magma, 1995; BHP, 1997d). Testing has focused on using very dilute sulfuric acid as a lixiviant, which is defined as a chemical that is used to extract a metal from solid materials. Magma designed the tests to assess leach extraction and acid consumption. BHP initiated a Pre-Feasibility metallurgical program in 1996 to provide information for the design and planning of the ISCR operation. The metallurgical program consisted of mineralogical studies; cation exchange experiments to evaluate reduction of soluble copper losses onto active sites in smectite clays; bottle roll tests to determine copper mineral solubility and acid consumption in a sulfuric acid lixiviant; column leach tests to quantify copper leaching parameters (kinetics and likely leach solution chemistry); and reclamation chemistry.

Table 1-2 summarizes the history of metallurgical programs carried out at the project site.

Table 1-2: Florence Metallurgical Program History

Test Program	Laboratory	Purpose	Data Table	Time Frame
Conoco	Hazen	Agitation leach and vat leach process development	-	1971-1974
Magma Small Column	McClelland	Heap leach and in-situ recovery comparison testing	-	1994
Magma APP Column	Brown & Caldwell	Enviro. Permit Data: Acid neutralization capabilities, PLS composition	-	1995
Magma Large Column	Magma San Manuel	Acid cure (135-150 g/l sulfuric) testing	-	1995
BHP Scoping	METCON	Determine optimum acid concentrations	Table 13-2	1996
BHP Phase 1	METCON & BHP San Manuel	Test synthetic raffinate on various mineralized types	Table 13-3, Figure 13-1	1997
BHP Phase2	BHP San Manuel	Test solution stacking & alternative lixiviants ($AlSO_4$)	Table 13-4	1997
Curis Phase 1	METCON	Confirm optimum acid concentrations and recovery	Table 13-5	2011-2012
Curis Phase 2	METCON	Confirm optimum acid concentrations and recovery	Table 13-6	2012
Curis Phase 3	METCON	Confirm optimum acid concentrations and recovery	Table 13-7	2012

1.13.1 Historical Column and Bottle Roll Tests

Leaching tests and mineralogical characterization studies were carried out by various laboratories for Conoco, Magma, and BHP. The column leach tests that were conducted by BHP were organized in three phases: a Scoping Phase, Phase I, and Phase II. In the Scoping Phase, Columns 1, 2, and 3 began with de-ionized water that was acidified with sulfuric acid (H_2SO_4) to concentrations of about 5, 10, and 20 grams H_2SO_4 per liter (g/L), respectively, whereas Column 4 was treated with raffinate from the San Manuel SX/EW plant. The BHP metallurgists concluded that the leaching solution containing about 10 g/L acid offered the best balance of copper dissolution, acid consumption, and cation loading (summation of cation concentrations in the final raffinate).

Phase I column tests were designed to examine copper leachability from samples representing major resource types. The samples included 6-inch core from the first planned mining block. Copper extraction ranged from 54% to 56% with an acid consumption ranging between 2.83 and 15.6 kg/metric ton of material (BHP, 1997c). Copper extraction curves for several of the column tests are shown in Figure 1-4.

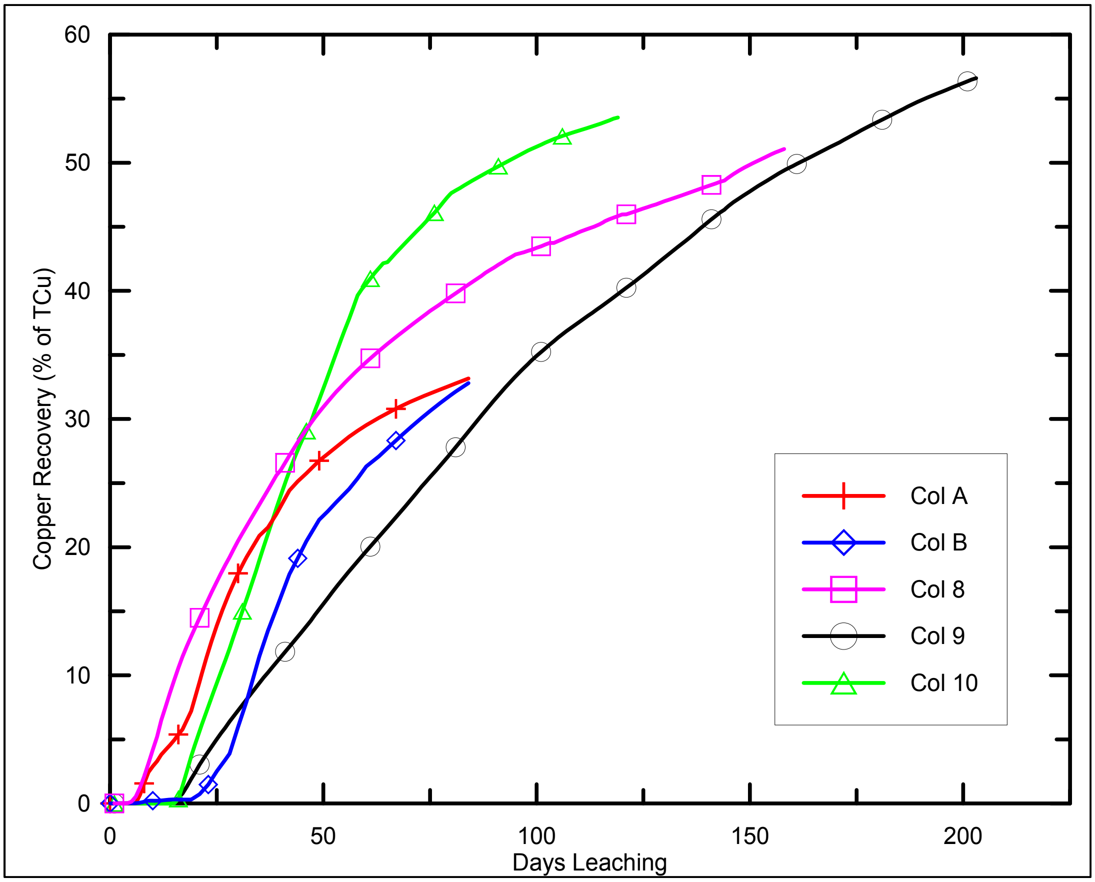


Figure 1-4: Total Copper Extraction Curves of Phase I Large-Scale Column Tests

The Phase II column tests were designed to determine the effectiveness of aluminum sulfate for pretreating typical chrysocolla mineralization to occupy active sites that would otherwise attract exchangeable cations, specifically calcium and copper. Copper extraction results were similar to those obtained in the Phase I tests, with relatively high rates of extraction still present at the termination of the tests.

The columns were operated sequentially to simulate solution "stacking", where low-grade Pregnant Leach Solution ("PLS") is reconstituted with acid and returned to the formation in an effort to increase the PLS grade. The results are summarized in Table 1-3.

Table 1-3: Summary of Results from Phase II Column Tests, BHP San Manuel

Column	Rock Type	Head Grade %TCu	Raffinate Source (Col. No.)	pH	Days	PV	Liters/ kg	%TCu dissolved	lb acid per ton	lb acid per lb Cu
C	QM	0.386 (calc)	A	1.5	133	31.8	7.25	52	1.77	7.08
D	Mixed QM + Tgdp	0.296 (calc)	C	1.7	126	28.1	6.22	35	-	-
Combined									3.30	10.13

Source: Compiled by SRK from BHP 1997d
QM - Quartz monzonite
Tgdp – Tertiary granodiorite porphyry

Copper was still being extracted at the termination of each column test, albeit at low copper concentrations, so the results are not considered to represent the maximum copper extraction obtainable.

1.13.2 Current Metallurgical Test Programs

The metallurgical test program, commissioned by Curis Arizona and utilized for the Pre-Feasibility Study, was performed by METCON Research of Tucson, Arizona (METCON). The goal of this program was to better simulate in-situ leaching of Florence copper oxide material by advancing relatively low-pressure flows of dilute sulfuric acid solution through intact pieces of drill core material. For this purpose, core samples were selected from five of six holes drilled in the spring of 2011, near the former BHP field test as well as a second location on the State Mineral Lease portion of the Florence resource area. The five selected Curis drill holes were designated as CMP11-01, CMP11-02, CMP11-03B, CMP11-05 and CMP11-06. The drill holes contained mineralized quartz monzonite and granodiorite porphyry. Care was taken not to mix the two mineralized types in any given box so that the leach characteristics of each type could be independently evaluated. The process used to test these boxes is presented in Section 13.2.

As of November 26, 2012, testing of the initial sixteen boxes (1 through 16) was completed and fully evaluated after undergoing locked-cycle leaching for approximately 150 days. As shown in Table 1-4, copper extractions ranged from 33% to 89% with an average of approximately 61% for all 16 boxes. Copper extraction averaged approximately 70% for those boxes within this set that were run with acid concentrations of 10 g/L.

Physical examination of the leached core showed no signs of preferential solution pathways (based on color and supported by tracer testing), suggesting that the contact between the leach solution and mineralized material was thorough, showing strong evidence for diffusion as an effective mechanism for liberating copper. Small amounts of precipitated gypsum were visually observed, mainly in the end sections of the core which were outside of the direct solution pathway. Subsequent mineralogical examination at the Colorado School of Mines confirmed that sulfates are present in very minor amounts in the residues, except in two boxes that contained core with over 1% calcite.

Table 1-4: Laboratory Test Results – Boxes 1-16

Test No.	Feed Sulfuric Acid (g/L)	Leach Cycle (Days)	Rinse Cycle (Days)	Calculated Head Assay (%Cu)	Gangue Acid Consumption lb/lb Cu	Cumulative Extraction (%Cu)
Box 1	5	152	43	0.46	8.88	47.47
Box 5	5	152	44	1.22	3.47	44.76
Box 9	5	186	46	0.77	3.89	63.51
Box 13	5	176	37	0.33	19.56	32.94
Box 2	10	152	79	1.00	6.95	88.72
Box 3	10	152	43	0.58	9.62	81.32
Box 6	10	152	79	0.32	15.94	71.68
Box 7	10	154	42	0.52	18.29	59.79
Box 10	10	134	78	0.55	9.32	63.54
Box 11	10	186	46	0.87	8.56	84.26
Box 14	10	134	78	0.47	5.04	47.79
Box 15	10	228	8	0.38	18.68	68.48
Box 4	20	152	78	0.49	40.54	34.74
Box 8	20	154	78	0.74	15.48	77.01
Box 12	20	176	37	0.48	29.34	48.30
Box 16	20	227	8	0.28	19.22	66.95

1.13.3 Metallurgical Recovery Assumptions

Previously, copper recovery for the Florence ISCR project was estimated by Lichtner, et al. (1996) using Magma laboratory test data, as function of copper recovery with respect to time: the "Lichtner Curve." This curve used relatively short-term laboratory leach test data to project a six-year leach cycle for each resource block. The copper recovery projection was the product of Copper Extraction, Sweep Efficiency, and Solution Recovery, where:

- Copper Extraction is the product of percentage of total copper that is potentially soluble and the percentage of this soluble copper that dissolves in five years.
- Sweep Efficiency is the percentage of the available copper that is contacted by the leach solution.
- Solution Recovery is the amount of copper in solution that is not lost to hydraulic control wells, the "bleed stream," or retained in the formation when rinsing starts.

Column testing indicated 61.6% of total copper was extractable in five years. Sweep efficiency of 80% was based on oil field experience. Recovered copper loss was estimated at 5%, making Solution Recovery 95%.

$$61.6\% \times 80\% \times 95\% = 47\%$$

METCON derived copper extraction curves for all eight boxes that had been leached with 10 g/L of free sulfuric acid. A composite copper extraction curve was calculated by METCON, based on 195 days of leaching. The resulting curve projects that copper extraction at 422 days will exceed 80% and asymptotically approaches 83.44%. The projected copper extraction was converted to a projection of copper recovery by applying factors for Sweep Efficiency and Solution Recovery, as shown in Table 1-5. These factors reflect anticipated well field conditions and suggest that the leach cycle time should be reduced to 4 years, because the incremental copper recovery of 1.6% for Years 5 and 6 are unlikely to support the operating costs for those years.

Table 1-5: Projected Copper Recovery

Year*	Cu Extraction (%)	Sweep Efficiency (%)	Solution Recovery (%)	Cu Recovery (%)
0	0	0	0	0
1	78.34	54	95	40.19
2	83.03	75	95	59.16
3	83.41	84	95	66.56
4	83.43	88	95	69.75
5	83.44	89	95	70.55
6	83.44	90	95	71.34
** Note that Year 1 begins after 3 months of pre-production leaching.*				

In summary, testing under BHP assumed a 5-year leach cycle, while the Preliminary Economic Assessment (SRK, 2010) assumed a 6-year cycle. This study recommends a 4-year cycle to lower the project costs based on the incremental copper recovery rate discussion above and the resulting optimum copper recovery of approximately 70%.

1.14 MINERAL RESOURCE ESTIMATES

SRK reviewed the drill hole database, resource estimation reports, and block model prepared by predecessor companies and completed a new resource estimate in 2010 using the historic data (SRK, 2010b). In 2011, SRK modified the 500 ft by 500 ft resource reporting cells from an east-west orientation to a diamond-shaped north-south orientation. This was done to match the orientation of the copper extraction production cells. This change in orientation made minor adjustments to the global resources relative to resources reported in 2010.

SRK reports current in-situ resources as shown in Table 1-6, at a 0.05% TCu cutoff grade. Based on current copper prices and a preliminary review of current project parameters, SRK believes that resources reported at a 0.05% TCu cutoff have a reasonable expectation of potential economic viability. For an ISCR project, actual mining cutoff grade is a complex determination that includes the thickness of the material zone, depth to bedrock, cost of acid, the recovery rate by mineral types, the PLS copper grade, and cycle times. SRK-reported resources are compliant with Canadian Institute of Mining, Metallurgy, and Petroleum ("CIM") resource classifications, and are sufficient for NI 43-101 reporting. All oxide resources including combined Measured plus Indicated and Inferred classifications at various cutoff grades are listed in Section 14.

Table 1-6: Florence Project Oxide Mineral Resources (SRK, 2011)

All Oxide in Bedrock (0.05 %TCu cutoff)			
Class	**tons**	**Grade**	**lb Cu**
Measured	296,000,000	0.354	2,094,000,000
Indicated	134,000,000	0.279	745,000,000
M+I	**429,000,000**	**0.331**	**2,839,000,000**
Inferred	63,000,000	0.235	295,000,000
Note: All oxide includes the entire copper oxide zone and iron-oxide leached cap zone including the top 40-foot of bedrock (bedrock exclusion zone). Contained metal values assume 100% metallurgical recoveries. The tonnage factor is 12.5 ft^3/ton.			

Section 14 on Mineral Resources defines the resource modeling and grade estimation parameters used by SRK for resource reporting. Section 14 tabulates at the 0.05% TCu cutoff the following global categories for historical reference:

- All oxide in bedrock (including iron-oxide leached cap and copper oxide zone);
- All oxide (as defined above) below the bedrock exclusion zone (top 40 feet of bedrock for which only partial leaching of rock is anticipated due to geometries of anticipated fluid flow from injection/recovery wells); and
- All oxide (as defined above) below the bedrock exclusion zone and within the current United States Environmental Protection Agency (USEPA) or Underground Injection Control (UIC) Permit boundary.

SRK reported all oxide mineralization in bedrock as the current mineral resource for the Florence Copper Project because Curis Arizona currently considers the project only as an ISCR operation. Sulfide mineralization is not considered potentially recoverable by ISCR methods and is not included in the current mineral resource or reserve estimates.

The mineral resource was used to estimate the mineral reserve for the ISCR extraction. SRK and Curis Arizona personnel compiled the information used to prepare the mineral reserve for the FCP Pre-Feasibility Study which was refined through the copper extraction plan prepared by Haley & Aldrich as described under Mining Method. A cutoff grade was applied to the edges of the resource area to provide an optimized resource area for use in the copper extraction plan. The resource area was then modified to avoid the power line right-of-way along the western edge of the deposit and to exclude any resource blocks north of the State Mineral Lease area. The Mineral Reserve is based upon the resulting outline and an internal cutoff grade of 0.05% TCu.

1.15 MINERAL RESERVE ESTIMATES

The overall summary of the reserve estimate as currently defined for the Curis FCP Pre-Feasibility Study is presented in Table 1-7. There are no Proven reserves pending the results of the planned field test and the assessment of in-situ metallurgical recoveries. The Probable reserve estimate includes the resources categorized as Measured and Indicated for oxide material within the resource boundary. The Probable reserve estimate does not include the inferred resources within the resource boundary. See Section 15 for a description on how the resources were converted into reserves.

Table 1-7: Probable Reserve Estimate at 0.05% TCu Cutoff (February 2013)

Tons	339,953,000
TCu Grade (%)	0.358
Contained Copper (lb)	2,435,400,000
Average Recovery (%)	69.7
Extracted Copper (lb)	1,698,000,000

1.16 MINING METHODS

ISCR, the mining method proposed for the FCP, is an extraction method used for selected mineral deposit conditions as an alternative to open pit or underground mine methods. ISCR is also used as a secondary recovery method for copper, typically coupled with open pit mining/heap leaching or underground mining. The ISCR process involves injection of a highly-diluted low pH lixiviant solution (consisting of over 99% water) into mineralized material and the dissolution of the copper, which is captured in surrounding recovery wells where the resulting PLS is pumped to the surface for collection and processing in the SX/EW plant.

The mining equipment used for this method includes wells, pumps and pipelines used to inject, recover and convey process solutions. The well installation sequence and description of well equipment are given in sections 16.2.1 and 16.2.2. The injection and recovery well design proposed by Curis Arizona is based on experience gained from the BHP pilot test, and is compliant with the Underground Injection Control (UIC) Permit issued to Florence Copper in 1997. Both the well design proposed by Curis Arizona and the well design employed by BHP incorporate a casing string that extends from ground surface, through the stratigraphy that overlies the Florence deposit, including the UBFU, MFGU, LBFU and at least 40 feet below the top of the Bedrock Oxide Unit that hosts the copper mineralization. The casing string will be composed of materials designed to withstand the proposed pressure and chemistry of the injected fluid. It will be cemented for its entire length and must pass a mechanical integrity test as defined by the USEPA. The proposed ISCR wells will be constructed with screened intervals located exclusively within the Bedrock Oxide Unit. A schematic well diagram is included as Figure 1-5.

An alternative design that includes an outer steel casing from land surface to 40 feet below the Bedrock Oxide Unit, as shown in Figure 1-6, will be used in the Phase 1 Production Test Facility well field. Contingency cost has been added to the initial capital of Phase 2 commercial operations to further evaluate this design, if necessary, pending the outcome of the Phase 1 well field testing.

The active ISCR well field will be surrounded by a network of perimeter wells that will be pumped to maintain positive hydraulic control. The perimeter wells will be surrounded by a network of observation wells that will be used to monitor hydraulic control at the edge of the

ISCR well field. The perimeter and observation wells will be constructed using a well design identical to the injection and recovery wells.

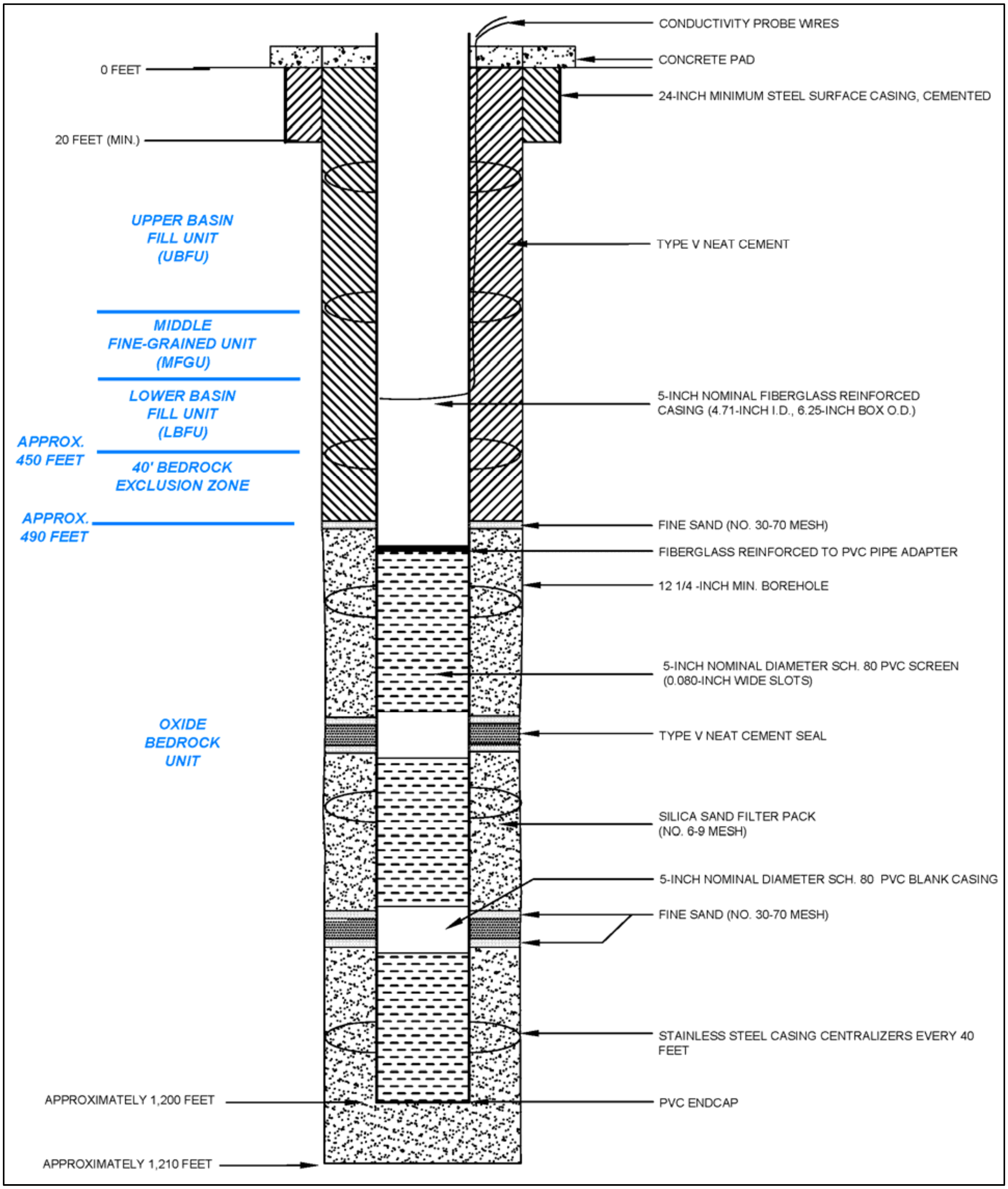


Figure 1-5: Phase II Injection and Recovery Well Design

(Source: Haley & Aldrich)

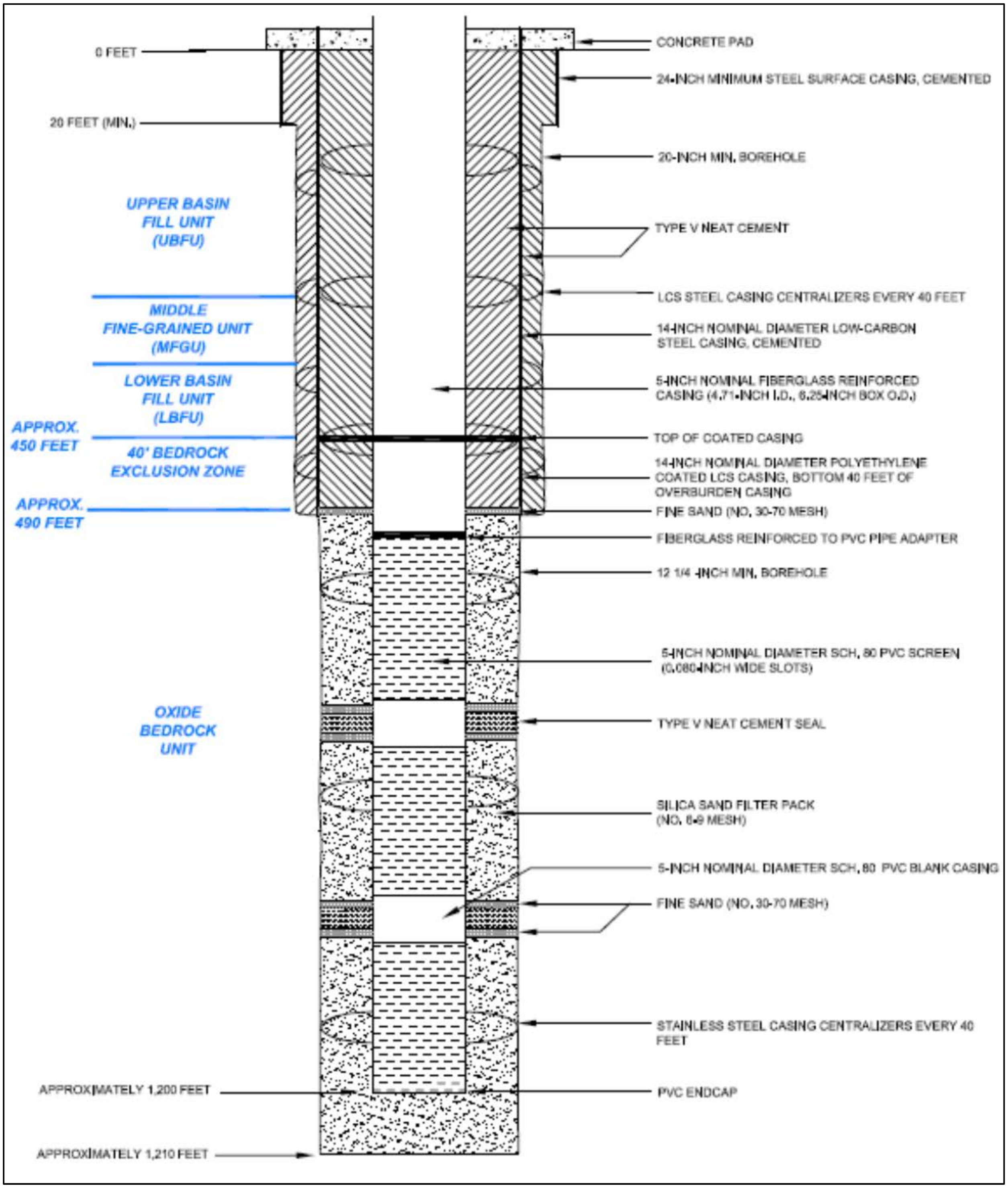


Figure 1-6: Phase I PTF Injection and Recovery Well Design

(Source: Haley & Aldrich)

The active ISCR well field will be surrounded by a network of non-production pumping (hydraulic control) and observation wells to ensure that acidified process solutions do not migrate away from the leaching zone. The hydraulic control wells withdraw additional (non-production) water from the oxidized bedrock zone. Withdrawal of the non-production groundwater creates a depression in the piezometric surface around the active ISCR, which creates groundwater flow toward the ISCR well field in all directions. The BHP pilot test demonstrated that hydraulic control could be established and maintained within the FCP mineralized body. The results of their successful demonstration of hydraulic control were submitted to the Arizona Department of Environmental Quality ("ADEQ") in a memo dated April 6, 1998 (BHP, 1998).

The anticipated hydraulic control pumping rate is expected to range from 3% to 10% of the recovery pumping. When combined with other operationally required on-site groundwater pumping, net groundwater extraction is expected to be approximately 1,100 gpm. Groundwater will be extracted at the individual perimeter wells at rates ranging from 5 to 30 gpm to maintain hydraulic control. The sub-regional groundwater flow model developed by Curis Arizona (Brown and Caldwell, 2011) has demonstrated that sufficient groundwater resources exist within the Bedrock Oxide Unit and the overlying Lower Basin Fill Unit, or lower conglomerate, (the lower portion of the sedimentary fill overlying Precambrian bedrock) to easily support the net groundwater extraction rate of 1,100 gpm for the duration of the proposed ISCR operations.

A copper extraction forecast was developed for the FCP to produce a target copper production of approximately 55 million pounds per year (mppy) through Year 5 and approximately 85 mppy by Year 7. The initial commercial phase will have a nominal SX throughput of 7,400 gpm and the second commercial phase will increase the nominal throughput to 11,000 gpm. The copper extraction forecast was developed using the assumptions presented below:

- The extraction model is based on key physical properties provided in SRK's 500-foot by 500-foot blocks (Section 14).
- Copper recovery is based on the METCON recovery curve and a conservative sweep efficiency factor over a four-year recovery cycle (Section 13).
- The injection and recovery well flow rate is based on an average of 0.1 gpm per linear foot of well screen.

The injection and recovery well flow rate of 0.1 gpm per linear foot of well screen is a key parameter used in the copper extraction schedule. This flow rate is applied to the material thickness of each resource block to determine the flow rate per well. In Years 1 through 3 a factor of 0.15 gpm per linear foot of well screen was used due to the nature of the resource encountered in the initial years (i.e. less than average thickness seen in the typical Florence oxide zone).

The copper extraction sequence begins on the State Mineral Lease area at a rate of approximately 55 million pounds per year through Year 5 and is ramped up to approximately 85 million pounds per year by year 7. The initial production area is located north of the canal to facilitate piping arrangements in the ISCR field. The extraction sequence progresses in a southeast to northwest fashion.

There are 971 injection wells and 1,104 recovery wells projected for the ISCR area. Wells must be installed for the new blocks coming on line during each year of production. The forecast shows these wells installed in the year prior to the production start year of the block in which the wells are installed.

There are 206 permanent perimeter and 102 permanent observation wells projected for the ISCR area. The perimeter and observation wells are installed along the outer edge of the active ISCR area. When the active area is along the outside edge of the resource area, the perimeter and observation wells are considered permanent installations. The perimeter and observation wells installed when the outer edge of the active area is within the resource area are temporarily used for this function and are "repurposed" as injection and recovery wells when the active area expands beyond them.

Blocks that are depleted of economically extractable copper require rinsing to flush out the remaining leach solution and restore the groundwater quality to levels required by the APP permit. Rinse solution is injected into and recovered from areas of the ISCR that have completed the four-year leach cycle, using the existing wells and surface infrastructure. Rinse flow rates were forecast in accordance with the extraction plan and represent a concurrent and proactive reclamation approach. The volume of rinse solution required to achieve the water quality objectives was simulated by Schlumberger (Schlumberger, 2012) using a regulatory-approved geochemical numerical model. The geochemical model used sulfate concentration as a proxy for completion of the rinsing process to estimate the number of pore volumes needed to attain the water quality objectives. The rinse water is initially low in pH and high in total dissolved solids with sulfate as the primary constituent. Rinse water is neutralized, filtered, and treated by reverse osmosis in the water treatment plant (Section 20.2) before being returned to the well field to facilitate additional rinsing.

1.17 RECOVERY METHODS

Copper recovery for the FCP utilizes SX/EW technology to produce cathode copper from the copper-bearing leach solutions pumped from the ISCR well field. The SX/EW plant is initially designed to handle a flow of 7,400 gpm with a recovered copper concentration of 1.8 grams per liter (g/L). After five years, the SX/EW plant will be expanded to handle a flow of 11,000 gpm. The processing plant and associated infrastructure is in the northeast corner of the State Land parcel. The process fluids are piped to and from the process plant in lined trenches.

The process consists of the following elements:

- ISCR well field;
- Lined PLS and raffinate ponds;
- SX Plant with three mixer settlers, increasing to four in Year 5, for operation in Year 6;
- Tank Farm for handling process liquids;
- EW Tankhouse;
- Ancillary warehouse and maintenance facilities;
- Water treatment plant and water impoundment facilities; and
- Existing Administration office complex near the eastern side of the site.

The source of copper for this process is PLS extracted from the recovery wells, as described above. PLS is collected in a process pond with a double geomembrane liner system on the west side of the plant site. The PLS pond has a design capacity of 6,480,000 gallons, which provides a 14.6-hour residence time at 7,400 gpm and 9.8-hour residence time at the ultimate design flow rate of 11,000 gpm.

The PLS pond is adjacent to the raffinate pond (west) and receives PLS from the well field. The pond is equipped with two vertical turbine pumps and one spare to deliver PLS to the SX Plant. In Year 5, a third vertical turbine pump will be added to increase the capacity to 11,000 gpm to the SX Plant.

PLS is pumped to the SX Plant where it is mixed with an organic, petroleum-based liquid containing an extractant that selectively removes copper from the PLS. The SX Plant consists of three reverse-flow mixer-settlers in a parallel configuration. The PLS flow is split between two extraction settlers. In the extraction settlers the PLS is mixed with the organic to enable transfer of the copper to the organic phase. The "loaded" organic and aqueous solutions are allowed to separate in the settlers due to the density differences in the liquids. The loaded organic is directed to the stripping settler where it is mixed with the electrolyte solution, which has a high acid content. The "lean" electrolyte strips copper from the organic solution, which then become "rich" electrolyte. Organic stripped of its copper load circulates back through the extraction mixer-settlers, progressively loading it with copper as it flows through the extraction train, removing 90% of the copper load in solution.

A fourth mixer settler will be added in Year 5 to increase the capacity of the SX system to 11,000 gpm in Year 6. The system is converted to a series-parallel configuration. In this configuration, half of the PLS flows through two mixer settlers in order to enhance the transfer of copper to the organic phase prior to being "stripped" in the extraction settler.

The extraction units consist of primary, secondary, and tertiary mix tanks that thoroughly combine the organic and PLS. The contact time and agitation in the mixers facilitates transfer of copper from the PLS solution to the extractant in the organic. The settlers are 67 feet wide, 102 feet long and 4 feet deep. The reverse-flow settlers direct the mixed solutions along the side of the settlers and through turning vanes that direct the separating solutions to flow back toward the mixers where the solutions are separated. The rich electrolyte solution is routed through the Tank Farm to EW filters.

The raffinate pond, with the same construction as the PLS pond, receives the solution, now called raffinate. The raffinate passes through a pair of coalescers that assist in removing residual organic from the raffinate. The raffinate is acidified by an in-line static mixer south of the pond downstream from the coalescers and the SX Plant. The raffinate pond is equipped with two vertical turbine pumps and one spare with 360 feet of total dynamic head to deliver the 7,400 gpm flow rate to the well field with enough pressure to enable injection of leach solution to the injection well field. In Year 5, a third vertical turbine pump will be added to increase the capacity to 11,000 gpm to the well field.

The Tank Farm is located south of the SX settlers at lower elevation to enable solutions to flow into the tanks by gravity. The Tank Farm holds process tanks, filters, pumps, and heat exchangers associated with the SX/EW process. Solutions are pumped from the Tank Farm to the respective process areas to maintain the process flow. The Tank Farm is located in secondary containment in accordance with best available demonstrated control technology ("BADCT") standards.

Primary process equipment located in the Tank Farm includes filters and heat exchanger. Rich electrolyte is filtered to remove solids and organics. The rich electrolyte flows by gravity from the extraction settler to the electrolyte filter feed tank. The rich electrolyte is pumped through the electrolyte filters. Filtered electrolyte is then pumped through a heat exchanger to transfer heat from the lean electrolyte to the rich electrolyte, and then on to the electrolyte recirculating tank.

A system is installed in the Tank Farm to process "crud" from solvent extraction. "Crud" is defined by operators as the material which accumulates at the organic/aqueous interface in the SX settlers. This material is treated to recover the valuable organics. The crud is removed from the settlers via an air-operated pump and transferred to a crud decant tank. The crud is allowed to settle in the decant tank. If required, clay can be added to remove impurities in the organic. The upper organic in the decant tank is recovered and sent to the loaded organic tank. The sediment at the bottom of the tank is pumped thru a filter and the filter cake removed.

The EW Tankhouse is located west of the Tank Farm and the SX Plant and utilizes permanent cathode technology initially with 74 cells, increasing to 100 cells in Year 5, for operation in Year 6. Each cell in the Tankhouse contains 67 lead anodes and 66 stainless steel "mother" cathodes. The cathode washing and stripping machine is located on the south end of the Tankhouse building. The EW Tankhouse cells are arranged in two parallel banks of 37 (50) cells each. In the hydraulic circuit, all cells are arranged in parallel allowing each cell to have the same feed solution and discharge solution. Electrically, the cells are connected in series.

Direct electrical current is supplied by two rectifiers. Current flows from the rectifiers through a bus bar to the bank of cells. Each cell is equipped with intracell bus bars, 66 cathode plates and 67 anode plates arranged in parallel. Within each bank, direct electrical current flows from a bus bar to the anode and then through the electrolyte to the cathode plates. An intercell bus bar provides current to the next cell successively and finally returns to the rectifiers.

Heated, filtered, rich electrolyte flows from the Tank Farm heat exchangers into the electrolyte recirculation tank where it mixes with overflow from the lean electrolyte tank. The solution from this tank is pumped to the Tankhouse cells where copper in solution is plated onto the cathode plates.

As a result of the electrochemical reaction at the anode, oxygen evolves from the EW cells creating a mist. The EW cells are covered to contain the mist and a surfactant is used to reduce the quantity of mist produced. Cobalt sulfate is also added to passivize the anode, and guar (a bean powder) is added as a surface modifier for the cathode.

1.18 PROJECT INFRASTRUCTURE

The FCP site is accessed by the Hunt Highway that lies along the north boundary of the project site. The Copper Basin Railway lies just north of the Hunt Highway. There is a siding approximately one mile east of the property that could be used to ship and take deliveries. A regional power transmission corridor is present near the western boundary of the site and includes an APS transmission line that provides power for the operation. Water supply for supporting activities will be provided by registered onsite wells and natural gas is available approximately 6,000 feet east of the property. Operation of the ISCR well field requires pumping more water from the mineralized bedrock formation than is injected as leach solution to provide hydraulic control. The mineralized bedrock formation is saturated with groundwater which will be continuously recirculated throughout the operational and closure phases of the project. Minor amounts of groundwater from the lower conglomerate formation overlying the mineralized bedrock will be drawn down into the bedrock formation to ensure capture of solutions throughout the life of the project. A water treatment plant will be installed to neutralize excess water from the operation and deposition of the solids and mechanical evaporation of the excess liquid.

1.19 MARKET STUDIES AND CONTRACTS

Curis Arizona is a guarantor for its parent company, Curis Resources Ltd., and has placed 25% of its copper cathode production over the life of the project under an off-take agreement with Red Kite Mine Finance Trust I. The agreement includes market based pricing and an optional extension. If the extension option is exercised, the percentage of copper cathode included in the sale rises from 25% to 30%. The off-take agreement is linked to a bridge loan and security agreement.

All non-committed copper cathode not included in the Red Kite Copper Cathode Sale and Purchase Agreement, will be sold in the open market, or subject to off-take arrangements yet to be negotiated.

Curis Arizona commissioned a study of future sulfuric acid availability and pricing which was completed by Elkbury Sulphur Consultants, Inc. ("Elkbury"), a consulting company dedicated to the sulfur and sulfuric acid industries, and the markets they serve. The study analyzed the results of a Request for Proposal (RFP) issued by Curis Arizona to five acid vendors located in the southwestern United States. The RFP requested pricing for acid to be supplied beginning in the year 2014, based on fourth quarter 2012 forecast prices.

Curis Arizona commissioned a study by P&R Consulting LLP (P&R) of the availability and pricing of electrical power to meet power demand for the life of the project. The FCP is expected to have a peak electric load of 18.1 megawatts (MW) (P&R, 2011).

1.20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

1.20.1 Permitting

The environmental liabilities of the FCP are limited, mostly related to historical mining and exploration activities conducted by Conoco in the mid-1970s and by Magma and BHP in the late 1990s. These liabilities, detailed in Section 4.6 of this report, are currently being addressed by a reclamation process that will be completed during the process of development and ultimate reclamation of the project.

Several environmental permits are required for operation of the FCP. Curis Arizona has obtained all but one of the various permits required to commence the first phase of operations, subject to any pending or new appeals or reviews. The list of permits is provided in Table 1-8. Section 4.7 provides details of the authorization, agency, purpose, term, history, and status of the various permits.

Table 1-8: List of Permits

Permit Name	Jurisdiction	Permit Status	Issue Date	Expiration Date	Reporting
Underground Injection Control Permit and Aquifer Exemption No. AZ 396000001	USEPA	Pending Modification Approval	5/1/1997	5 Year Review	Quarterly
Aquifer Protection Permit No. 101704 (Commercial Operations)	ADEQ	Current-Pending Amendment	8/12/2011	N/A	Quarterly
Temporary Aquifer Protection Permit No. 106360 (PTF Operations)	ADEQ	Pending Appeal	9/28/2012	2 Years From Date of Authorization to Begin Work	Quarterly
Air Quality Permit No. B31064.000	Pinal County Air Quality Control District	Current	12/16/2011	12/15/2016	Annually
Storm Water Multi-Sector General Permit Authorization No. AZMSG-61741	ADEQ	Current	5/31/2011	1/31/2016	Annually
Permit to Withdraw Groundwater for Mineral Extraction and Metallurgical Processing No. 59-562120	ADWR	Current	4/5/2010	5/31/2017	Annually
Mined Land Reclamation Plan	ASMI	In Progress	20 year term	N/A	Annually
AZ State Mineral Lease #11-026500	ASLD	Current	2/24/2010	12/13/2013	Monthly
Septic System Permit	ADEQ	Current	2010[1]	N/A	N/A
Change-of Water Use Permit	ADWR	Current	2/25/1997	N/A	N/A
Burial Agreement Case No. 2012-012	Arizona State Museum	Current	6/21/2012	N/A	N/A
Programmatical Agreement	USEPA	Current	1/19/1996	30 Day Notice	N/A
EPA Hazardous Waste ID No. AZD983481599	USEPA	Current	4/4/2012 (signature date)	N/A	N/A

[1] *ADEQ gave Notice of Transfer (NOT) No. 74190*

The Curis private property in the Town of Florence has been known to support mining operations or investigations for some forty years, although in recent years the Town of Florence has zoned it for a mix of residential, commercial and industrial uses. The Arizona State Land portion of the project is not subject to the Town's jurisdiction. Curis Arizona plans to initially develop the FCP on the Arizona State Land and expand into the remaining portion of the resource as the resource on the State Land is depleted.

State and Federal permitting authorities are in the process of reviewing all FCP's technical, development and environmental protection measures proposed for the project in both Phase 1 and Phase 2 commercial scale operations. Discussions are ongoing with local stakeholders with regard to addressing any remaining project related concerns.

1.20.2 Environmental and Archeological Studies

Numerous environmental studies have been completed at the FCP site. The studies include the following:

- A jurisdictional water review,
- Archeological (cultural) investigations,
- Wildlife and threatened and endangered (T&E) species investigations,
- Groundwater monitoring,
- Groundwater geochemical modeling,
- Groundwater hydrologic modeling, and
- A hydraulic control and rinsing test.

The results of the studies and estimates of cost for monitoring, mitigation and reclamation have been incorporated into operations and closure aspects of the project and included in the capital and operating costs areas as appropriate. These studies are discussed more in depth in Section 20.1 of this report.

Westland Resources, Inc. ("Westland") was retained by Curis Arizona to review the project site for potential jurisdictional waters as defined by Section 404 of the Clean Water Act. The review is essentially an update of an earlier study prepared in the 1990s for Magma/BHP. Curis Arizona has designed the project to avoid disturbance of the potential jurisdictional waters identified by Westland.

Western Cultural Resource Management ("WCRM") updated the cultural resource inventory for the project site and to assist in preparing the programmatic agreement to support the UIC Permit. The Curis Arizona Area of Potential Effects has been the subject of numerous investigations for nearly a century. Past projects have documented a total of 59 sites; of these, 42 have been determined eligible for inclusion in the National Register; effects at two were mitigated in 1997; eight have been determined not eligible; and seven are of undetermined eligibility.

A biological evaluation ("BE") of the project site was prepared by Westland. The BE encompassed approximately 620 acres (Project Area), which includes the 160-acre Arizona State Land parcel. The results of the study indicate there are no threatened and endangered species on or near the Project Area and the Project Area is not located within any designated or proposed critical habitat. There is potential for two candidate species, the Sonoran Desert Tortoise and the Tucson shovel-nosed snake, to occur at the site even though the habitat in the Project Area is not considered ideal. Although the report did not include recommendations, Curis Arizona has proposed the use of tortoise fencing in sensitive areas such as around the water impoundments.

A compliance monitoring program involving 31 point of compliance ("POC") wells was initiated in accordance with requirements specified in the Aquifer Protection Permit ("APP") and UIC Permit, after the APP and UIC Permits were issued in June 1997. The program involves the analysis of seven parameters per well each quarter and the analysis of 41 parameters per well once every two years (biennially). Samples continue to be collected and analyzed quarterly and compared to Alert Levels ("ALs") and Aquifer Quantity Limits ("AQLs") specified in the APP and the UIC Permit. Reports of sampling and analytical results are submitted quarterly to the Arizona Department of Environmental Quality ("ADEQ") and USEPA.

Schlumberger Water Services ("SWS") updated the geochemical modeling for the FCP. SWS prepared a technical memorandum (SWS, 2012) detailing the geochemical modeling for the FCP. The results of the rinsing simulations indicate that targeted concentrations of sulfate and other constituents may be achieved through rinsing with 8.5 to 9 pore volumes of natural formation groundwater.

Brown and Caldwell ("BC") reviewed and revised a sub-regional groundwater flow model developed in support of the APP and UIC Permit applications submitted by BHP in 1996. BC found that the substantial quantity of site-specific hydrologic data generated since 1996 warranted a thorough revision of the earlier groundwater flow model. In 2010, BC created new groundwater flow model covering the same sub-regional model domain used in the 1996 model using improved software and model construction techniques.

BHP constructed and operated a pre-operational compliance test in 1997/98 to satisfy a specific condition of the APP. The APP required a demonstration of hydraulic control be performed for a period of approximately 90 days prior to commencement of commercial operations. The BHP hydraulic control test was conducted from November 8, 1997 through February 10, 1998. The goal of the test was to demonstrate that four pairs of pumping and observation wells were adequate to demonstrate a continuous inward hydraulic gradient in the aquifer. BHP prepared a report on April 6, 1998 documenting the hydraulic control test. This report was submitted to ADEQ and USEPA as a demonstration of compliance with the permit condition. Following completion of the test, ADEQ amended the permit by removing the 90-day, pre-operational test requirement and re-issuing the permit for full commercial operation. The rinsing conducted by BHP and Merrill Mining demonstrated that, through a combination of injection and passive inflow of fresh formation water, that the sulfate and other constituent concentrations can be rinsed to levels established in the APP for closure.

1.20.3 Waste Disposal

Curis Arizona retained the firm ARCADIS to perform a Pre-Feasibility assessment of technologies available to treat excess solutions over the life of the project. The flow to the water treatment plant will be comprised of three solution streams including hydraulic control water, raffinate bleed, and extracted rinse water. The treatment plant will be built in phases starting with high density lime neutralization of raffinate bleed and hydraulic control solutions in year 1, followed by implementation of low pressure filtration and reverse osmosis beginning in Year 5 to treat the formation rinse water extracted after conclusion of ISCR at individual extraction blocks. The treated water after year 5 will be used to facilitate rinsing of the retired extraction blocks.

The solids produced by the water treatment system will be deposited and managed in a series of ponds designed to BADCT standards to receive process fluids and solids. Curis Arizona retained Knight Piésold ("KP") to design the ponds that will contain the solids, and will be used for fluids management. Using fluid flow and solids values provided by ARCADIS, KP calculated the volume and corresponding size and number of ponds required to contain the solids and manage the associated fluid flows. KP estimated that a total of 73 million cubic feet (mcf) of solids would be produced over the life of the ISCR facility and that those solids could be contained within five impoundments, with a capacity of 15.2 mcf per impoundment with appropriate freeboard remaining. Solids will be capped in place using a regulatory-approved closure design plan as described in Section 20.2.

1.20.4 Sustainable Community Development

Community development is the process of increasing the strength and effectiveness of communities, improving people's quality of life, and enabling people to participate in decision making to achieve greater long-term control over their lives. Sustainable community development programs are those that contribute to the long-term strengthening of community viability.

The Town of Florence is approximately 50 square miles in size and is roughly equidistant from the state's two major metropolitan areas: Phoenix (65 miles) and Tucson (60 miles). The Town was established in 1866, and is the county seat for larger Pinal County; it remains one of the state's most historic municipalities with approximately 8,000 residents.

Major employment in Florence is provided by nine correctional institutions incarcerating approximately 18,600 inmates. Private employment, excluding private prisons under contract with the State, is minimal.

1.20.4.1 Community Outreach

Since acquiring the FCP site in late 2009, Curis Arizona has implemented a community outreach program and commensurate activities to support the advancement of the FCP. Public consultation, education, and ongoing dialogue within various stakeholder communities are in progress. Below is a list of programs and activities employed and completed since the inception of initial work at Florence Copper:

- Site Tours
- Presentations

- Local Advertising
- Industry Organizations
- Communications and Media
- Coordinating with Local Suppliers
- Working State Agencies and Government
- Open Houses

1.20.4.2 Community Investment Foundation

On October 6, 2011 Curis Arizona announced the establishment of a multi-year Economic Development, Community Development and Revitalization Fund, (Copper Recovery Enhances Economic Development). In 2012, the fund was upgraded to a foundation called the Florence Copper Community Foundation. Phase I of this program will correspond to the first operational phase of the project, known as the Production Test Facility ("PTF"), currently scheduled to begin once permits have been received. Phase II will occur during full commercial operations.

Curis Arizona will establish the Foundation with a budget of $100,000 during Phase 1.

This fund is not required by law and would be in addition to normal tax benefits that would flow to Florence, Pinal County, and Arizona as a result of commercial operations.

1.20.4.3 Community Surveys

Florence Copper enjoys a majority of support from residents within the Town as evidenced by internal polling and Florence's own 2011 Citizen Survey. Issues of highest concern for Florence residents are a lack of jobs and the depressed economy; education; ground water protection and public safety. New polls will be conducted in the second quarter of 2013.

1.20.4.4 Socioeconomic Analysis

Curis Arizona commissioned the L. William Seidman Research Institute at Arizona State University (ASU) to conduct an Economic Impact Study for the FCP. It determined that the Town of Florence, Pinal County, and the State of Arizona stand to benefit in terms of high-wage employment and millions in total revenues as a result of FCP operations (Source: L. William Seidman Research Institute at Arizona State University, Florence Copper Project – Economic Impact Study, 2011).

The ASU Economic Impact Study utilized the 2010 PEA. The ASU study concludes the following impacts to the socioeconomic environment in the region as a result of the FCP:

- <u>Gross State Product</u> (GSP) is the most comprehensive indicator of economic performance for a state or region and represents new production, sometimes called "value added." GSP for Arizona and Pinal County contribute to the tally of Gross Domestic Product (GDP) for the nation, our measure of the country's annual output of goods and services.
    - <u>Gross State Product Impact</u>: It is estimated that the FCP will add $2,245 million to Arizona Gross State Product (see Table 1-9) over the life of the project.

   - Gross State Product (GSP) produced in Pinal County will increase by an estimated $1,078 million over this period.
   - The annual average addition to Arizona GSP over the entire project life is estimated at $80 million (in constant 2011 dollars). The annual average addition to GSP produced within Pinal County is $39 million.
- Employment Impact:
   - The FCP is expected to create and support an annual average of 681 Arizona jobs (see Table 1-10) over the duration of the mine.
   - The annual average employment within Pinal County from the FCP is expected to be 406 jobs.
   - Approximately 170 jobs will be required at the FCP site for mineral recovery during the operations phase.
   - 18.7% of workers on site are in scientific, technical, or engineering occupations (see Table 1-11).
   - Over all of the project phases, more than 500 additional Arizona jobs supported each year will be in other industries in the overall general economy.

The job count includes the direct employment on site, jobs supported indirectly in firms or government agencies that supply goods and services to FCP, as well as induced employment that stems from the expenditures of all these workers as consumers.

- Personal Income:
   - FCP is expected to increase Personal Income in Arizona by $1,464 million over the life of the project.
   - Personal Income to residents of Pinal County will rise by an estimated $709 million over this period.
- State Revenue:
   - Economic activity related to Florence Copper will generate approximately $204 million in revenue for Arizona public agencies through taxes and fees over the duration of the three phases of the project.
   - More than 90% of new Arizona revenues ($190 million) would be created within Pinal County.

Table 1-9: Economic Impact Summary

Impact Locus	Total Impact	Annual Average Impact
Gross State Product		
Arizona	$2,245,000,000	$80,000,000
Pinal County	$1,078,000,000	$38,000,000
Employment (Jobs)		
Arizona	-	681
Pinal County	-	406
Personal Income		
Arizona	$1,464,000,000	$52,000,000
Pinal County	$709,000,000	$25,000,000
State Revenues		
Arizona	$204,000,000	$7,000,000
Pinal County	$190,000,000	$7,000,000
Note: dollar values are constant 2011 dollars *Source: REMI model of Arizona and Pinal County economies*		

Table 1-10: Economic Impact of Florence Copper Project By Phase

Impact Category	Construction Phase	Production Phase	Reclamation/ Closure Phase	Total Impact
	2012 – 2014	2015 – 2032	2033 – 2038	2012 – 2038
Gross State Product*	**Gross State Product by Phase**			**GSP**
Arizona	146,000,000	1,772,000,000	326,000,000	2,245,000,000
Pinal County	56,000,000	834,000,000	189,000,000	1,078,000,000
Total Employment	**Annual Average Employment by Phase (Jobs)**			**Employment**
Arizona	585	787	392	681
Pinal County	285	453	316	406
Personal Income*	**Personal Income by Phase**			**Personal Income**
Arizona	88,000,000	1,129,000,000	247,000,000	1,463,000,000
Pinal County	34,000,000	532,000,000	143,000,000	709,000,000
State Revenue*	**Annual State Revenue by Phase**			**State Revenue**
From Activity in Arizona	14,000,000	154,000,000	36,000,000	204,000,000
From Activity in Pinal Co.	13,000,000	143,000,000	33,000,000	190,000,000
** Values in Millions of 2011 Dollars* *Source: REMI Model of Arizona and Pinal County economies*				

Table 1-11: Occupations in U.S. Mineral Mining Compared to Florence Copper Project Workforce

Category	U.S. Workforce Distribution	Florence Copper Workforce
All Occupations	100.0%	100.0%
Administration, Business, Financial, Office	17.3%	16.1%
Scientific, Technical, Engineering	9.1%	18.7%
Operations, Extraction	51.3%	26.7%
Maintenance, Materials, Equipment, Storage	22.3%	38.5%
Source: U. S. Bureau of Labor Statistics, National Employment Matrix, 2008 and Florence Copper		

1.20.4.5 Local Hire & Procurement Policy

Curis Arizona mandates a hiring and procurement policy for the company, contractors, and consultants as detailed below. Curis Arizona will:

- Ensure that local people receive priority consideration for employment, based on qualifications and merit;
- Ensure that local companies (contractors, suppliers and consultants) receive priority consideration for contract opportunities, based on qualifications and merit;
- Where possible, provide or facilitate access to training to ensure that local residents gain the skills and qualifications necessary for employment; and
- Where possible, assist local companies to identify future contract opportunities and to build the capacity necessary to benefit from these opportunities.

Curis Arizona emphasizes that the first consideration for awarding new employment and contract opportunities will always be qualifications and merit. Among qualified candidates and companies, preference will be given to those in closest proximity to Curis Arizona's operations.

In summary, the establishment of the FCP is expected to result in a number of economic benefits for Florence, Pinal County, and Arizona. In addition to the above, the project offers the following opportunities:

- Significantly increase the percentage of private sector employment in Florence.
- Increase employment opportunities for skilled workers in Florence and Pinal County.
- Add economic diversity to the region and complete the "Copper Corridor" in Arizona.
- Increase the number of high wage jobs in Florence and the region.
- Offer an incentive for younger workers to live in Florence and Pinal County.
- Demonstrate good environmental operating practices, social responsibility and economic viability.

1.20.5 Mine Closure Requirements and Costs

Mine closure requirements for the FCP will consist of remediation and reclamation activities. The mine closure requirements require restoring the affected property and aquifer to pre-mining conditions unless certain facilities are shown to remain to support the post mining land use. Remediation requirements generally refer to the closure of the facilities that are related to the APP and the UIC Permit. The reclamation activities generally relate to reclaiming of surface disturbances and structure removal and are covered in the Mined Land Reclamation Plan (pending).

The closure and post-closure costs were originally developed by BC to support the APP Significant Amendment Application. It is assumed that closure will begin when copper concentrations in the PLS pumped from the last remaining resource blocks in the ISCR area decline to levels that can no longer be economically recovered. These activities include groundwater restoration, abandonment of the ISCR wells, piping removal, process pond closure, in-place closure of the sediment-containing water impoundments, removal of the processing facilities, and closure and removal of the septic systems.

A groundwater monitoring program will be conducted at all POC wells in accordance with the APP. This monitoring will continue for 30 years during the post-closure period, as required by the UIC Permit. In accordance with and on approval of the ADEQ, at the end of the 30-year post-closure monitoring period, abandon the 31 POC wells in accordance with the provisions of the APP and the well abandonment plan referenced in the APP. Furthermore, the well abandonment plan is designed to meet Arizona Department of Water Resources ("ADWR") and USEPA requirements.

A summary of the closure and post-closure costs is shown in Table 1-12.

Table 1-12: 2010 Closure and Post-Closure Cost Estimates

Closure Cost Description	Estimated Cost*
Groundwater Restoration Rinsing and Well Abandonment	$32,600,000
PLS Pond Closure	$200,000
Raffinate Pond Closure	$200,000
Runoff Pond Closure	$100,000
Water Impoundment Closure	$1,900,000
Tank Farm Decommissioning	$100,000
Septic Tank Closure	$10,000
Miscellaneous Costs	$200,000
Closure Cost Subtotal	$35,300,000
Contingency (15%)	$5,300,000
Administrative and Miscellaneous Expenses (10%)	$3,500,000
Closure Total	**$44,100,000**
Post-Closure Cost Description	**Estimated Cost**
Post-Closure Monitoring	$1,200,000
POC Well Abandonment	$300,000
Post-Closure Total	**$1,500,000**
CLOSURE AND POST CLOSURE TOTAL	**$45,600,000**

*Any mathematical discrepancies are due to rounding.

1.21 CAPITAL AND OPERATING COSTS

Capital and operating costs for the FCP were estimated on the basis of the preliminary design, estimates from other consultants for the project, budgetary quotes for major equipment, and analysis of the process flowsheet and predicted consumption of power and supplies.

1.21.1 Operating and Maintenance Costs

Operating and maintenance costs for FCP operations are summarized by cost center areas. Cost centers include well field operations, process plant operations, and the General and Administration ("G&A"). Process operating costs were estimated for the life of the operation based on an annual production of 55.5 mppy in the first 5 years of operation and 85 mppy for subsequent years. The well field costs are based on producing PLS with a copper concentration of approximately 2.0 g/L and a SX recovered grade of 1.8 g/L at the rate of approximately 7,400 gpm in the first 5 years and 11,000 gpm in subsequent years. The PLS is delivered to the SX/EW plant by means of direct pumping from the PLS pond, as described in “Recovery Methods” (Section 17). Lifetime average operating cost is $0.80 per pound of copper produced, which includes well field, processing plant, and G&A costs.

Well field operating costs include estimates of labor, power, reagents, maintenance, and supplies and services for the operation of the well field and water treatment plant in the well field area to neutralize, treat, and evaporate excess process solutions. Maintenance is estimated based on labor, supplies, and outside services necessary to maintain the wells. This includes moving the well field pumps and piping, and replacing and repairing submersible pumps used for extraction. Supplies and services include fuel for the maintenance vehicles, tools and supplies, and other services necessary to maintain the well field pumps, piping, containment system, and road network within the well field. Well field costs are estimated at $0.342 per pound of copper produced.

Process Plant operating cost for the life of operation is estimated to average $0.25 per pound of copper. Each of the components of plant operating cost includes labor, power, reagents, maintenance, and supplies. Solvent extraction contributes $0.121 per pound, the Tank Farm contributes $0.011 per pound, Electrowinning $0.092 per pound, and Ancillary Services contributes $0.022 per pound.

G&A costs include labor and fringe benefits for the administrative personnel, human resources, and accounting. Also included are office supplies, communications, insurance, and other expenses in the administrative area. All other G&A costs were developed as allowances based on historical information from other operations and other projects. The life of operation operating average is estimated to be $0.12 per pound of copper. The operating costs are as follows:

Table 1-13: Operating Cost Summary Table

Operating Cost	Cost	$/lb. Cu
Well Field	$580,000,000	$0.34
SX/EW Plant	$417,000,000	$0.25
Water Treatment Plant	$150,000,000	$0.09
General Administration	$208,000,000	$0.12
Total Operating Cash Cost	**$1,354,000,000**	**$0.80**
Royalties, Incidental Taxes (excludes Income Taxes), Reclamation, and Misc.	$524,000,000	$0.31
Total Cash Cost	**$1,878,000,000**	**$1.11**

1.21.2 Capital Cost Estimate

Capital costs for the project were estimated using budgetary equipment quotes, material take-offs for concrete, steel, and earthwork, estimates from vendors and subcontractors for such things as pre-engineered buildings and production wells, and estimates based on experience with similar projects of this type. Some of the costs and quantity estimates used by M3 were supplied by other consultants.

- KP provided quantities associated with earthmoving, construction, and fencing on process ponds.
- Haley and Aldrich provided quantities and timing of wells for the ISCR well field.
- ARCADIS provided designs and cost estimates for the water treatment plant.
- Haley & Aldrich provided the cost estimate for reclamation.
- Arizona Public Service Company provided a cost estimate for completing electrical transmission lines to the plant substation and furnishing a transformer.
- Southwest Natural Gas provided a cost estimate for providing natural gas to the site boundary and installing gas lines in customer-dug trenches.

The capital cost estimates include both initial capital and sustaining capital for the project. Initial capital is defined as all capital costs through the end of construction. Capital costs predicted for later years are carried as sustaining capital in the financial model. Sustaining capital costs include planned expansion of the plant in Year 5. Capital costs in US dollars are based on quotes obtained in the fourth quarter of 2011, escalated by 2% (based on data from Engineering News Record).

The accuracy of this estimate for those items identified in the scope-of-work is estimated to be within the range of ±20%. Contingencies are estimated to cover items of cost which fall within the scope of the project, but are not sufficiently characterized at the time the estimate is developed. M3 estimated the contingency at 20% of the direct and indirect costs (Contracted Cost).

Initial capital expenditures for this project include the construction of the ISCR well field and SX/EW plant. The financial indicators have been determined with 100% equity financing of the initial capital. Any acquisition cost or expenditures prior to start of the full project period have been treated as “sunk” cost and have not been included in the analysis.

The total initial capital carried in the financial model for new construction and pre-production well field development is expended over a 3-year period and shown in Table 1-14. The initial capital includes Owner’s costs and contingency. The capital will be expended in the years before production and a small amount carried over into the first production year.

Table 1-14: Initial Capital

	Cost
Well field	$54,000,000
SX-EW Plant	$66,000,000
Utility, Infrastructure, and Ancillaries	$54,000,000
Owner's Cost	$15,000,000
Initial Capital Cost	**$189,000,000**
Pre-Production Costs	$19,000,000
Total	**$ 208,000,000**

1.22 ECONOMIC ANALYSIS

The financial evaluation presents the determination of the NPV, payback period (time in years to recapture the initial capital investment), and the IRR for the project. Annual cash flow projections were estimated over the life of the operation based on the estimates of capital expenditures and production cost and sales revenue. The sales revenue is based on the production of a copper cathode. The estimates of capital expenditures and site production costs have been developed specifically for this project and have been presented in earlier sections of this report. The financial evaluation is on the base case economics of the project as described in section 22.

1.22.1.1 Production

Well field production is reported as soluble copper removed from the ISCR leaching operation as PLS. The annual production figures were obtained from the extraction plan as reported elsewhere in this report. The design basis for the process plant is a nominal flow of 11,000 gpm (7,400 gpm, initially) of PLS at an average copper concentration of 2.0 g/L and recovered grade of 1.8 g/L at the SX Plant. Average annual full-rate production is projected to be approximately 85 million pounds. Total life of operation production is projected at approximately 1,695 million pounds of copper.

1.22.1.2 Copper Sales

The copper cathodes are assumed to be shipped to buyers in the US market, with sales terms negotiated with each buyer. The financial model assumptions are based on experience with copper sales from similar operations in the US.

The company has committed 25% of its copper production at market terms for the life of mine to RK Mine Trust I pursuant to an outstanding 2 year Bridge Loan facility. If the Bridge Loan facility is extended to 3 years, the off-take commitment to RK Mine Trust I becomes 30%.

1.22.1.3 Initial Capital Costs

See Section 1.21.2 for the summary of initial capital costs. See Section 21.2 for additional detail on capital costs.

1.22.1.4 Sustaining Capital

A schedule of capital cost expenditures during the production period was estimated and included in the financial analysis under the category of sustaining capital. The total life of operation sustaining capital is estimated to be $627 million. This capital will be expended during a 22-year period and consists of $512 million for well installation and equipping, $28 million for well field infrastructure development, $7 million for cultural resource mitigation, $7 million for plant expansion in Year 5, and $72 million for water treatment system expansion and construction of process water management impoundments.

1.22.1.5 Working Capital

A 15-day delay of receipt of revenue from sales is used for accounts receivables. A delay of payment for accounts payable of 30 days is also incorporated into the financial model. In addition, a working capital allowance of approximately $3 million for plant consumable inventory is estimated in Year -1 and Year 1. All the working capital is recaptured at the end of the mine life and the final value of these accounts is zero.

1.22.1.6 Revenue

Annual revenue is determined by applying estimated metal prices to the annual payable metal estimated for each operating year. Sales prices have been applied to all life of operation production without escalation or hedging. The revenue is the gross value of payable metals sold before treatment charges and transportation charges. The copper prices used in the evaluation are $3.50/lb. for the first three years as forward curve pricing and $2.75/lb. for subsequent years.

1.22.1.7 Total Production Cost

Total Production Cost is the Total Operating Cost plus royalty, property and severance taxes, and reclamation and closure costs. The average Total Production Cost over the life of the operation is estimated to be approximately $1.11 per pound of copper produced.

The royalty for the life of the operation is estimated at $342 million and averages $0.202 per pound of copper recovered. Royalties estimated include $162 million for the State Mineral Lease, $123 million for Conoco and $56 million for BHP.

Property and severance taxes are estimated to be $112 million and average $0.066 per pound of copper recovered. Property taxes were estimated to be approximately $75 million and severance taxes are estimated to be approximately $38 million.

Reclamation and closure costs include well abandonment costs for core holes and production wells, closure of process water impoundments, demolition of processing facilities and ancillary structures, and restoration of the land surface to pre-development conditions. The total cost for reclamation and closure is estimated to be $39 million and is calculated as $0.023 per pound of copper recovered.

1.22.1.8 Income Taxes

Taxable income for income tax purposes is defined as metal revenues minus operating expenses, royalty, property and severance taxes, reclamation and closure expense, depreciation and depletion.

Income taxes are estimated by applying state and federal tax rates to taxable income. The primary adjustments to taxable income are tax depreciation and the depletion deduction. Income taxes estimated in this manner total $592 million for the life of the project and were provided by Curis and Curis' tax consultant.

Net Cash Flow after Tax is estimated to be $1,488 million.

1.22.1.9 NPV and IRR

At a $2.75/lb long term copper price, the economic analysis of the base case (shown as 70% recovery in Table 1-15) before taxes indicates an Internal Rate of Return (IRR) of 36% and a payback period of 2.6 years. The Net Present Value ("NPV") before taxes is $727 million at a 7.5% discount rate. The economic analysis after taxes indicates that the project has an IRR of 29% with a payback period of 3.0 years. The NPV after taxes is $503 million at a 7.5% discount rate. Table 1-15 compares the sensitivity of financial indicators when the metal recovery percentage changes.

Table 1-15: Sensitivity to Metal Recovery Percentage

	Recovery Sensitivity		
	63%	70%	75%
Years of Commercial Production	23	25	26
Total Copper Produced (lbs)	1,510,000,000	1,695,000,000	1,830,000,000
LOM Copper Price (avg $/lb)*	$2.83	$2.82	$2.81
Initial Capital Costs ($)	$217,000,000	$208,000,000	$204,000,000
Payback of Capital (pre-tax/post-tax)	2.7/3.2	2.6/3.0	2.5/2.9
Internal Rate of Return (pre-tax/post-tax)	34%/28%	36%/29%	38%/31%
Life of Mine Direct Operating Cost ($/pound Cu Recovered)	$0.83	$0.80	$0.77
Life of Mine Total Production Cost ($/pound Cu Recovered)	$1.14	$1.11	$1.08
Pre-tax NPV at 7.5% discount rate	$643,000,000	$727,000,000	$796,000,000
Post-tax NPV at 7.5% discount rate	$440,000,000	$503,000,000	$552,000,000
Total Number of Years of Production on Arizona State Land	12	13	13

*Copper price assumptions are based on consensus pricing from a broad selection of commodity analysts and investment banks and are $2.75/lb long term and $3.50/lb during the first 3 years of production.

Table 1-16 compares the base case project financial indicators with the financial indicators when other different variables are applied. By comparing the results it can be seen that fluctuation in the copper price has the most dramatic impact on project economics. Fluctuation in the initial capital cost has the least impact on project economic indicators.

Table 1-16: Sensitivities for Copper Price, Operating Cost and Initial Capital Cost

Copper Price			
	NPV @ 7.5%	IRR %	Payback (years)
Base Case	$ 503,000,000	29%	3.0
20%	$ 730,000,000	38%	2.5
10%	$ 616,000,000	34%	2.7
-10%	$ 388,000,000	25%	3.9
-20%	$ 271,000,000	20%	5.2
Operating Cost			
	NPV @ 7.5%	IRR %	Payback (years)
Base Case	$ 503,000,000	29%	3.0
20%	$ 437,000,000	27%	3.4
10%	$ 470,000,000	28%	3.2
-10%	$ 535,000,000	31%	2.9
-20%	$ 567,000,000	32%	2.8
Initial Capital			
	NPV @ 7.5%	IRR %	Payback (years)
Base Case	$ 503,000,000	29%	3.0
20%	$ 479,000,000	26%	3.7
10%	$ 491,000,000	28%	3.3
-10%	$ 514,000,000	32%	2.8
-20%	$ 525,000,000	34%	2.6

1.23 INTERPRETATION AND CONCLUSIONS

Based on the existing project data, and input from Curis Arizona and independent consultants working for Curis Arizona, a conceptual ISCR well field production schedule for life-of-production development has been prepared with estimated costs of development, operation, and closure. Based on the production schedule and estimated copper recovery from metallurgical test data, approximately 85 million pounds of copper can be recovered annually by ISCR well field methods. M3 has used industry available information to appropriately size and cost a SX-EW copper recovery plant to be constructed on the property for planned cathode copper production as saleable product.

M3 has completed this Pre-Feasibility Study of the potential ISCR viability of the project, utilizing industry standard criteria for Pre-Feasibility-level studies. The results of this study indicate that ISCR development of the FCP offers the potential for positive economics based upon the information available at this time.

The base case economic analysis results indicate an after-tax NPV of $503 million at a 7.5% discount rate with an IRR of 29%. Payback will be in Year 3 of production in a projected 25-year mine-life. The economics are based on a base case of $2.75/lb long-term copper price, and an initial design copper production rate of 55.5 mppy, increasing to 85 mppy in Year 5. Direct operating costs are estimated at $0.80/lb of copper. Total capital costs are estimated at $835 million, consisting of initial capital costs of $189 million (plus $19 million of pre-production costs), and ongoing sustaining capital over the life of operations of $627 million.

As with any pre-development property, there are risks and opportunity attached to the project that need further assessment as the project moves forward. M3 deems those risks, on the whole, as identifiable and manageable.

1.23.1 Project Risks

Risks for this project are of three major types, as is typical for any prospective mineral extraction project. The most onerous of the risk factors are those which prevent the development of the project. Another set of factors has to do with delays in the project timeline that increase the cost of development and render capital formation for the project more difficult. The third set of risks involves increasing costs and thereby decreasing profits. The risks are broken down as follows:

1. **Preclusion of Project Success.** Risks that would preclude the success of the project include inability to permit the project and failure of the process. The risk of either factor for this project is considered to be low due to the following factors:

    a. The project was granted the necessary permits in the 1990s.
    b. The permitting process for the Phase 1 PTF is on track for approval in the first half of 2013.
    c. Once the success of the PTF is demonstrated, there should be no obstacles to obtaining the additional and amended permits for Phase 2.
    d. SX/EW technology is proven, providing very low risk of failure.
    e. While the ISCR process has not been demonstrated on a commercial scale as a stand-alone project, the in-situ recovery process has been used for decades in association with open pit and underground copper mining, solution mining (uranium, potash, sodium bicarbonate and salt) and groundwater restoration projects has proved to be highly successful.

2. **Project Delays.** The risk presented by delays to the project is deemed to be low because of the following factors:

    a. The State of Arizona is supportive of the development of the project because it will provide significant employment and royalty, property, sales, and income revenues for the State.
    b. An APP for Phase 1 operations has been secured and is currently undergoing administrative review.
    c. Successful demonstration of the technology and hydraulic control in the PTF should pave the way for rapid approval of the Phase 2 development of the project.

   d. A small risk of delay is associated with a change in political leadership in the State or effective opposition at the Federal level.
   e. There is also a risk of delay depending on the final resolution of current or future legal actions relating to or affecting the FCP.

3. **Profitability Risks.** The largest groups of risks with potential impacts to the project are those which have a chance to negatively impact the profitability of the project. These potential impacts involve well field issues and water treatment issues. These risks are broken down as follows:

   a. Several potential impacts are associated with the well field in terms of well construction and well field operation. The oxide mineralized body is highly fractured and incompetent, complicating the process of drilling and well installation. It may be difficult to maintain an open borehole during drilling and installation of the well screen, casing, and formation stabilizing filter pack. Until the proposed drilling and well installation designs and methods are demonstrated in the PTF, there is a risk that the techniques necessary to overcome these obstacles could be more expensive than anticipated for the cost estimates used in this study. Drilling productivity could be significantly impacted and a high failure rate in well construction would increase the costs, if it were higher than the 5% failure rate included in the financial models. If fouling of injection wells becomes a problem, costs to rehabilitate or replace wells, which are not included in this study, would add to the cost of production.

   b. There are several risks that involve rinsing and water treatment that could increase the cost of the project. The ability to treat the water extracted from rinsing depleted blocks and re-inject it for further rinsing is one of the assumptions used in this Pre-Feasibility Study. The cost of such treatment and the ability of the system to provide treated water at a quality that is effective in rinsing the depleted blocks are assumed for purposes of this study. Significant increases in cost or the inability to treat to sufficiently high quality could impact the profitability of the project.

1.23.2 Project Opportunities

Several opportunities for increases in productivity and revenue or lowering costs have been identified which would increase the viability and profitability of the project. In general, conservative estimates have been used in the estimation of this project. Performance in some of these areas has the likelihood of exceeding the conservative estimates thereby increasing production or lowering costs. Several specific factors can be identified that would enhance the economics of the project, including the following:

- Improvements in the techniques used to drill and install wells could reduce the cost of well installation over the life of the project. Well installation costs amount to approximately 65% of the projected capital costs for the project.

- Optimization of the well spacing will be evaluated with data from the PTF. Increased well spacing would mean fewer wells consequently lowering the sustaining capital cost for the project. Operator experience in different resource blocks over the life of operation is expected to optimize well spacing distances.

- Water treatment costs and assumptions are based on neutralizing the excess raffinate “bleed stream” that is removed to compensate for water and acid additions to the process. Potential operational savings could be realized if the bleed stream were used to precondition advanced mineralized blocks or if the acid could be recovered prior to neutralization.

- The water treatment conceptual design stipulates that the reverse osmosis reject stream is discharged to the process water impoundments for settling of solids and evaporation of liquids. The density of solids produced by this process is estimated to be rather low. In addition, the amount of water for evaporation exceeds the excess water produced by hydraulic control pumping and process make-up additions. Process improvements to the water treatment design could result in a higher density of sediment and a lower volume of water requiring evaporation. Reductions in sediment volume due to higher densities could result in reducing process water impoundment construction costs. Reductions in water volume for evaporation would reduce evaporation costs and the cost of supplying make-up water for rinsing.

- Another opportunity for this project is the possibility of treating the excess process, hydraulic control, and rinse water to a quality that would be acceptable for a beneficial use, such as irrigation. An irrigation canal bisects the deposit and would be an ideal vehicle for transmitting the treated waste water to potential customers. Beneficial use could reduce the cost of water treatment and reduce the amount of water that would need to be evaporated.

1.24 RECOMMENDATIONS

The authors of this study recommend the following:

- The details of the commercial-scale water treatment process need to be further developed in order to advance this aspect of the project to a feasibility level. On-going work, currently being undertaken by ARCADIS, will result in a process flow diagram and water balance, more specific information on the equipment used to accomplish the objectives, and a feasibility-level capital and operating cost estimate.

- Continued metallurgical testing is recommended to optimize rinsing of completed copper recovery blocks and possibly reduce the volume of solution required for this activity.

- Optimization studies are recommended to enable the ISCR process to be operated in the most efficient manner.

2 INTRODUCTION

The Florence Copper Project ("FCP" or the "Project") is an advanced-stage oxide copper project located in central Arizona and controlled 100 percent by Curis Resources Ltd. ("Curis"). The FCP is a shallowly buried porphyry copper deposit that is amenable to in-situ copper recovery ("ISCR") and solvent extraction-electrowinning ("SX/EW") copper production. The property including surface and subsurface rights consists of private patented land totaling approximately 1,182 acres and a leased parcel of Arizona State Land of approximately 159.5 acres in size. M3 Engineering & Technology Corporation ("M3") was commissioned by Curis Resources (Arizona) Inc. ("Curis Arizona") to prepare a Pre-Feasibility Study of the FCP that is compliant with the Canadian Securities Administrators (CSA) National Instrument 43-101F1 ("NI 43-101") (CSA, 2011). As primary author of this Pre-Feasibility Study, M3 was integral to development and engineering of copper extraction and processing facilities as well as capital and operating cost estimates for the FCP.

This report has been prepared in accordance with the guidelines provided in NI 43-101 Standards of Disclosure for Mineral Projects, and conforms to Form 43-101F1 for technical reports. The Resource and Reserves definitions are as set forth in the Appendix to Companion Policy 43-101CP, Canadian Institute of Mining, Metallurgy and Petroleum (CIM) – Definitions Adopted by CIM Council, June 30, 2011. Curis Arizona may also use this Pre-Feasibility Study Report for any lawful purpose to which it is suited. The intent of this report is to provide the reader with a comprehensive review of the potential economics of this mining operation and related project activities, and to provide recommendations for future work programs to advance the Project.

2.1 SOURCES OF INFORMATION

The sources of information include data and reports supplied by Curis Arizona personnel and documents referenced in Section 27. M3 used its experience to determine if the information from previous reports was suitable for inclusion in this report and adjusted information that required amending. Revisions to previous data were based on research, recalculations, and information from other projects. The level of detail utilized was appropriate for this level of study.

This Pre-Feasibility Study is based on information collected by M3 during the site visit. In addition, a number of meetings were conducted between M3 and Curis Arizona. This Pre-Feasibility Study report is based on the following sources of information.

- Personal inspection of the FCP site and surrounding area;
- Technical information provided to M3 by Curis Arizona through various reports;
- Information provided to M3 by SRK Consulting (SRK) related to resource model generation and subsequent extraction modeling by Haley & Aldrich, Inc. (H&A);
- Technical and economic information subsequently developed by M3 and associated consultants; and
- Additional information obtained from public domain sources.

The information contained in this report is based on documentation believed to be reliable. The recommendations and conclusions stated in this report are based on information provided to M3.

2.2 LIST OF QUALIFIED PERSONS

The individuals who have provided input to this Pre-Feasibility Study have extensive experience in the mining industry and are members in good standing of appropriate professional institutions. The Certificates are provided as Appendix A. Author responsibilities for the report sections are as shown in Table 2-1.

Table 2-1: List of Qualified Persons and Associated Responsibilities

Author	Company	Designation	Date of Most Recent Site Visit	Section Responsibility
Richard Zimmerman	M3	R.G., SME-RM	25-May-2011	2, 3, 17, 18, 21, 22, 25, 26, 27 (Recovery Methods, Project Infrastructure, Capital and Operating Costs, Economic Analysis, Interpretations, Conclusions, Recommendations, and References)
Michael R. Young	Haley & Aldrich	SME-RM	11-October-2012	4, 5, 6, 15, 16, 19, 20.1, 20.3, 20.4, 20.5, 24 (Mineral Reserve Estimates, Mining Method, Market Studies, and Environmental Studies and Permitting)
Corolla Hoag	SRK	C.P.G., SME-RM	21-April-2012	7, 8, 9, 10, 11, 12, 14, 23 (Geological, Exploration, Drilling, Sample Analysis, Data Verification, Resource Estimation, and Adjacent Property Description)
Terence P. McNulty	T. P. McNulty & Associates	P.E., SME-RM	21-October-2012	13 (Metallurgical Testing)
Dennis Tucker	ARCADIS	P.E.	16-Dec-2011	20.2 (Water Treatment)
Richard Frechette	Knight Piésold	P.E.	2011	20.2 (Water Impoundment)

2.3 SITE VISIT & PERSONAL INSPECTION

Site visits were made by the QPs involved in preparing this report as shown in Table 2-1. M3 personnel participated in a site visit on May 25, 2011. Various M3 personnel have subsequently visited the site on numerous occasions. Site visits have included examination of the existing buildings and process facilities at the site, the well field area, drill core recovered from the deposit, and existing infrastructure at the site.

2.4 TERMS OF REFERENCE AND UNITS OF MEASURE

This Pre-Feasibility Study Report is intended for the use of Curis Arizona for the further development and advancement of the FCP toward the Feasibility Study stage. It provides a mineral resource estimate, a classification of resources in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") classification system, and an evaluation of the property, which presents a current view of the potential project economic outcome.

Imperial units (American System) of measurement are used in this report. Abbreviations are given in Section 2.4.4. All monetary values are based on 4th Quarter 2011 U.S. dollars ($), escalated 2% to bring them up to 1st Quarter 2013 dollars, unless otherwise noted.

2.4.1 Mineral Resource Definition

The mineral resources and mineral reserves have been classified according to the "CIM Standards on Mineral Resources and Reserves: Definitions and Guidelines" (June 2011). Accordingly, the Resources have been classified as Measured, Indicated or Inferred, the Reserves have been classified as Proven, and Probable based on the Measured and Indicated Resources as defined below.

A Mineral Resource is a concentration or occurrence of natural, solid, inorganic or fossilized organic material in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.

An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings, and drill holes.

An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings, and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

2.4.2 Mineral Reserve Definition

A Mineral Reserve is the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study includes adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.

A 'Probable Mineral Reserve' is the economically mineable part of an Indicated, and in some circumstances a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study includes adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified.

A 'Proven Mineral Reserve' is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study includes adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.

2.4.3 Glossary

Term	Definition
Assay	The chemical analysis of mineral samples to determine the metal content.
Capital Expenditure	All other expenditures not classified as operating costs.
Composite	Combining more than one sample result to give an average result over a larger distance.
Concentrate	A metal-rich product resulting from a mineral enrichment process such as gravity concentration or flotation, in which most of the desired mineral has been separated from the waste material in the ore or mineralized material.
Crud	In an SX-EW operation, "Crud" is defined by operators as the material which accumulates at the organic/aqueous interface in the SX settlers.
Cut-off Grade (CoG)	The grade of mineralized rock, which determines as to whether or not it is economic to recover its copper content by further concentration.
Dip	Angle of inclination of a geological feature/rock from the horizontal.
Fault	The surface of a fracture along which movement has occurred.
Footwall	The underlying side of an ore/mineralized body or stope.
Gangue	Non-valuable components of the mineralized material.
Grade	The measure of concentration of copper within mineralized rock.
Hanging wall	The overlying side of an ore/mineralized body, fault, or slope.
Igneous	Primary crystalline rock formed by the solidification of magma.
Kriging	An interpolation method of assigning values from samples to blocks that minimizes the estimation error.

Term	Definition
Lithological	Geological description pertaining to different rock types.
LoM Plans	Life-of-Mine plans.
LRP	Long Range Plan.
Material Properties	Mine properties.
Mineral/Mining Lease	A lease area for which mineral rights are held.
Mining Assets	The Material Properties and Significant Exploration Properties.
Ongoing Capital	Capital estimates of a routine nature, which is necessary for sustaining operations.
Ore Reserve	See Mineral Reserve.
RoM	Run-of-Mine.
Sedimentary	Pertaining to rocks formed by the accumulation of sediments, formed by the erosion of other rocks.
Shaft	An opening cut downwards from the surface for transporting personnel, equipment, supplies, mineralized material and waste.
Stratigraphy	The study of stratified rocks in terms of time and space.
Strike	Direction of line formed by the intersection of strata surfaces with the horizontal plane, always perpendicular to the dip direction.
Sulfide	A sulfur bearing mineral.
Tailings	Finely ground waste rock from which valuable minerals or metals have been extracted.
Thickening	The process of concentrating solid particles in suspension.
Total Expenditure	All expenditures including those of an operating and capital nature.
Variogram	A statistical representation of the characteristics (usually grade).

2.4.4 Abbreviations

Abbreviation	Unit or Term
%	percent
°	degree (degrees)
°C	degrees Centigrade
µ	micron or microns, micrometer or micrometers
A	Ampere
a/m^2	amperes per square meter
AA	atomic absorption
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AL	Alert Level
APP	Aquifer Protection Permit
AQL	Aquifer Quality Limit
ASLD	Arizona State Land Department
ASMIO	Arizona State Mine Inspector's Office
BC	Brown & Caldwell
bft^3	billion cubic feet
BLM	US Department of the Interior, Bureau of Land Management

Abbreviation	Unit or Term
cfm	cubic feet per minute
cm	Centimeter
cm^2	square centimeter
cm^3	cubic centimeter
CoG	cut-off grade
Crec	core recovery
Cu	Copper
dia.	Diameter
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
FA	fire assay
famsl	feet above mean sea level
ft	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)
ft^3/st	cubic foot (feet) per short ton
g	Gram
g/L	gram per liter
g/st	grams per short ton
gal	Gallon
g-mol	gram-mole
gpm	gallons per minute
Ha	hectares
HDPE	High Density Polyethylene
hp	horsepower
ICP	inductively coupled plasma
ID2	inverse-distance squared
ID3	inverse-distance cubed
ILS	Intermediate Leach Solution
in	inch
kg	kilograms
km	kilometer
km^2	square kilometer
kst	thousand short tons
kst/d	thousand short tons per day
kst/y	thousand short tons per year
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
kWh/st	kilowatt-hour per short ton
L	liter
L/sec	liters per second
lb	pound

Abbreviation	Unit or Term
LHD	Load-Haul-Dump truck
LLDPE	Linear Low Density Polyethylene Plastic
LoM	Life-of-Mine
M	meter
m.y.	million years
m^2	square meter
m^3	cubic meter
Ma	million years ago
mg/L	milligrams/liter
mi	mile
mi^2	square mile
Mlb	million pounds
mm	millimeter
mm^2	square millimeter
mm^3	cubic millimeter
MSHA	Mine Safety and Health Administration
Mst	million short tons
Mst/y	million short tons per year
MVA	megavolt ampere
MW	million watts
NEPA	National Environmental Policy Act of 1969 (as Amended)
NGO	non-governmental organization
NI 43-101	Canadian National Instrument 43-101
PLS	Pregnant Leach Solution
PMF	probable maximum flood
POO	Plan of Operations
ppb	parts per billion
ppm	parts per million
psi	pounds per square inch
QA/QC	Quality Assurance/Quality Control
QEMSCAN	Quantitative Evaluation of Miner als by SCANning electron microscopy
RC	reverse circulation drilling
RQD	Rock Quality Description
SEC	U.S. Securities & Exchange Commission
sec	second
SG	specific gravity
SRK	SRK Consulting (U.S.), Inc.
st	short ton (2,000 pounds)
st/d	short tons per day
st/h	short tons per hour
st/y	short tons per year
SX/EW	Solvent Extraction (SX) / Electrowinning (EW)
t	tonne (metric ton) (2,204.6 pounds)

Abbreviation	Unit or Term
TSF	tailings storage facility
TSP	total suspended particulates
UIC	Underground Injection Control
USEPA	United States Environmental Protection Agency
V	volts
VFD	variable frequency drive
W	watt
XRD	x-ray diffraction
yd^2	square yard
yd^3	cubic yard
yr	year

3 RELIANCE ON OTHER EXPERTS

The authors, as Qualified Persons, have examined the historical data for the Florence property provided by Curis Resources (Arizona) Inc. (Curis Arizona), and have relied upon that basic data to support the statements and opinions presented in this Technical Report. The historical data, such as original field mapping, cross sections, level plans, and detailed project reports prepared by Conoco, Magma Copper Company ("Magma"), and BHP Copper Inc. ("BHP"), are now part of the project data files in possession of Curis Arizona. Curis Arizona has subsequently conducted a borehole investigation which supports the historical data.

In the opinion of the authors, the Florence historical data, in conjunction with borehole assays conducted by Curis Arizona, are present in sufficient detail to prepare this report and are generally correlative, credible, and verifiable. The project data are a reasonable representation of the FCP property. Any statements in this report related to deficiency of information are directed at information that, in the opinion of the authors, is recommended by the authors to be acquired.

The authors have relied upon Curis Resources Ltd, through a letter from Xenia Kritsos, Curis' legal counsel, dated March 28th 2013, confirming that title to the fee simple land and State Mineral Lease comprising the FCP are held in the name of Curis Arizona and these are in good standing. The authors did not independently confirm details associated therewith.

The authors have relied upon the work of others to provide the basis for cost estimates for significant components of the life-of-operations economic model. Royalty and tax information was provided to the authors by Simon Beller of Curis Resources Ltd. through email correspondence dated January 28th, 2013. Electrical power costs were provided in a report from Jerry D. Smith of P&R Consulting LP dated January 25th 2012. Lime reagent costs were provided by Steven Lowe of Mine Logistics in an email dated August 29th 2011. Sulfuric acid reagent costs were provided by Neil S. Seldon of Neil S. Seldon and Associates Ltd., in conjunction with Elkbury Sulphur Consultants Inc., in a report dated September 2011. Archeological costs were provided in a report dated January 15th 2013 by Stephen W. Yost of Western Cultural Resources Management. Table 3-1 provides the contributions of others and relevant report sections.

Table 3-1: Other Experts for Current Work Program and Relevant Report Section

Report Section	Expert	Area of Reliance
4 – Property Description and Location	Xenia Kritsos, Curis Arizona	Land tenure and land title
4.7.10, 4.7.11, and 20.1.2 – Archeological Investigations	Stephen W. Yost, WCRM	Cultural resources mitigation costs
20.5 – Closure Costs	Timothy Schumacher, P.E., Haley and Aldrich	Closure Costs
21.1.2.2 – Electrical Power	Jerry D. Smith, P.E., P&R Consulting LP	Electrical power costs
21.1.2.3 – Reagents	Steven Lowe, Mine Logistics & Procurement	Lime costs
21.1.2.3 – Reagents	Elkbury Sulphur Consultants, Inc.	Sulfuric acid costs
22.7.1 – Royalty 22.7.2 and 22.8 – Taxes	Simon Beller, Curis Arizona	Current status of taxes and royalties

4 PROPERTY DESCRIPTION AND LOCATION

4.1 PROPERTY AREA

The Curis Arizona FCP is located in Pinal County, Arizona. The property, including surface and subsurface rights, consists of private patented land totaling approximately 1,182 acres, and a parcel of Arizona State Land of approximately 159.5 acres.

4.2 PROPERTY LOCATION

The property is located within the limits of the Town of Florence, approximately 2.5 miles northwest of the town center. The site address is 1575 West Hunt Highway, Florence, Arizona 85132. The approximate latitude and longitude of the planned in-situ copper recovery (ISCR) area are 33° 02’ 49.07” North and 111° 25’ 47.84” West.

4.3 MINERAL TENURE RIGHTS

Curis Arizona obtained 1,182.59 acres of fee-simple land from Merrill Ranch Properties, LLC on December 17, 2009. Curis Arizona owns the surface rights and all of the mineral rights of some 1,182.59 acres of patented land in the area containing the deposit. Curis Arizona’s holdings span portions of sections 26, 27, 28, 33, 34, and 35 of Township 4 South, Range 9 East. The resource area covers approximately 216 acres in the S½ of section 28 and the N½N½ of section 33. A portion of the surface and mineral rights (approximately 159.5 acres) is on State Trust Lands of Arizona (N½S½ of section 28, described as Arizona State Mineral Lease 11-26500), which has been assigned to Curis Arizona. Within the fee-simple title, there is no limit on the depth of the mineral rights or the time in which those minerals must be extracted.

Arizona State Mineral Lease 11-26500 (totaling 159.5 acres) was assigned to Curis Arizona on February 24, 2010. The Lease includes rights to mine copper, gold, silver, and other valuable minerals within the spatial and time limits of the Lease. There is no limit on the depth of resources that can be mined in association with the State Mineral Lease.

4.4 ROYALTIES

There are three separate royalty claims applicable to the FCP.

- **State of Arizona:** The land included within Arizona State Mineral Lease 11-26500 is subject to a mineral royalty payable to the State of Arizona. It consists of a percentage of the gross value of the minerals produced, which percentage cannot be less than 2% nor more than 8% according to a “Copper Index Price” within copper price parameters between 84.8 cents per pound on the low end and 161.0 cents per pound on the high end, and adjusted by mine cost inflation or deflation. The current Arizona State Mineral Lease expires on December 13, 2013 and is renewable.
- **Conoco Inc.:** A 3% “Net Returns” royalty applicable to the entire property is payable to Conoco Inc. This royalty is subordinate to royalties paid to third parties, but even where such royalties exist, the royalty created will not be less than 2% of “Net Returns.” “Net

Returns" is defined as the "Gross Value" received by the grantor less all expenses incurred by the grantor with respect to such minerals after they leave the property.

- **BHP Copper Inc.:** A 2.5% "Net Profits Interest" royalty applicable to the entire property excluding the land included within Arizona State Mineral Lease 11-26500, is payable to BHP. "Net Profits" is defined as net proceeds and revenues received from the sale of product plus insurance proceeds, government grants and tax refunds, less all exploration, development and operating costs.

4.5 PROPERTY TENURE RIGHTS

Curis Arizona owns the private property encompassing the FCP. The private property falls within the boundaries of the Town of Florence. Curis Arizona also leases under Arizona State Mineral Lease 11-26500 approximately 159.5 acres of Arizona State Land, which includes approximately 42% of the recoverable copper resource. The Arizona State Land is not subject to the jurisdiction of the Town of Florence.

The Curis private property in the Town of Florence has been known to support mining operations or investigations for some forty years, although in recent years the Town of Florence has zoned it for a mix of residential, commercial and industrial uses.

Curis Arizona pays annual property taxes on the private parcels and pays annual lease payments to the Arizona State Land Department.

4.6 ENVIRONMENTAL LIABILITIES

The FCP property has some limited environmental liabilities relating to historical mining and exploration activities conducted by Conoco in the mid-1970s and by Magma and BHP in the late 1990s. These liabilities occur on the private lands held by Curis Arizona as well as state trust lands administered by the Arizona State Land Department ("ASLD").

4.6.1 Well and Core-Hole Abandonment

Exploration activities conducted by Conoco resulted in the completion of approximately 366 core holes on the FCP property and associated State land. The Underground Injection Control (UIC) permit, Aquifer Protection Permit ("APP"), and State mine reclamation requirements necessitate the location and abandonment of these core holes prior to mine closure. However, the majority of these core holes were completed without surface monuments or casing. Over the years, the physical locations of many of these drilling locations have become obscured, especially those located in active agricultural fields. The Arizona Department of Water Resources ("ADWR") has approved a core hole abandonment plan that addresses the uncertainty associated with locating every drill site and grants conditional closure for those drill sites that cannot be located using the prescribed survey and geophysical locating methodologies. The costs for completing the core hole abandonment plan are addressed in the approved reclamation plan and secured with a reclamation bond approved by the ADEQ.

4.6.2 Historical Mining Activities

In the mid-1970s, Conoco conducted limited underground operations on the FCP property. The intent of these operations was to generate representative quantities of sulfide and oxide material for small batch-scale testing to be processed at a pilot plant located near the current mine headquarters.

As part of the limited mining operation, Conoco completed two vertical shafts on the property. The shafts included a 72-inch diameter production shaft and a 42-inch ventilation and emergency access shaft. Underground mining reportedly occurred from December 1974 to December 1975 and included the removal of approximately 31,700 tons of oxide material, 16,900 tons of sulfide material, and 1,500 tons of waste rock.

Following the cessation of underground mining operations, mining equipment and infrastructure were reportedly removed from underground, and the head frames dismantled and removed. Although access to the shafts is appropriately controlled by fencing and permanent covers, the shafts themselves are not permanently abandoned in accordance with Arizona State Mine Inspector ("ASMI") requirements. The costs to permanently abandon the two shafts are not addressed in the current reclamation plan or financial assurance instrument.

4.6.3 Pilot Mineralized Material Processing Activities

Using sulfide and oxide material mined from the underground operations, Conoco operated a pilot scale processing plant on the property for approximately one year beginning in 1975. The pilot plant tested and optimized various concentrating and leaching processes using a small scale crushing, grinding, flotation, vat and agitation leaching circuits, and solvent extraction/ electrowinning ("SX/EW") facility. More complete details of the underground mining and pilot test facilities can be found in the *Phase II Feasibility Study* prepared by the Conoco Minerals Department in 1976.

When processing the oxide material, Conoco operated a 100-ton per day vat leaching circuit. The circuit consisted of ten above-ground concrete leaching vats built on a concrete slab with acid-resistant coatings. Oxide material was loaded into the vats via overhead conveyor and processed using a variety of leaching sequences. Pregnant leach solutions (PLS) were transferred via aboveground pipes to the PLS holding tank, and subsequently processed in the SX/EW plant located in the process building. Spent oxide material was reportedly triple rinsed with fresh water and subsequently transferred to a small unlined tailings impoundment on the property. The oxide tailings are still located on the property, and although not required by law, Curis has included the cost to reclaim the impoundment in the approved reclamation plan and financial assurance instrument.

Conoco also experimented with an agitation leach process using a 6 ton-per-day process circuit. A four tank leach circuit was operated inside the process building. Spent oxide material was reportedly rinsed with fresh water and subsequently transferred to the unlined oxide tailings impoundment on the property. The oxide tailings are still located on the property and the cost to reclaim the impoundment is included in the approved reclamation plan.

For sulfide material, Conoco operated a 50-ton-per-day conventional flotation circuit inside the process building. Following batch flotation, tailings from the concentrating process were transferred to an approximate 33,000-gallon thickener tank and subsequently discharged into a small unlined sulfide material tailings impoundment. The sulfide tailings are still located on the property, and although not required by law, the cost to reclaim the impoundment is included in the approved reclamation plan and financial assurance mechanism.

4.6.4 Chemical and Sanitary Pond

The Conoco facility reportedly utilized a small unlined pond for the disposal of treated sanitary waste and untreated process wastes pumped from the reagent mixing area in the process building. Sanitary waste was treated in a prefabricated aerobic digester before being pumped to the sanitary pond.

4.6.5 Pilot Plant Decommissioning

Subsequent to Magma's acquisition of the project, MP Environmental was retained to decommission the pilot plant. All process fluids, reagents, and process residues were removed from the facility and all tanks and process units were thoroughly decontaminated and cleaned. The equipment was eventually removed from the site for re-use at other Magma facilities, sold, or disposed at regulated landfills.

An inspection of the facility was conducted by BC in October 1995. Brown and Caldwell's ("BC") observations of the facility were documented in BC's Focused Facilities Investigation (Brown and Caldwell, 1996e).

4.6.6 Agricultural Impacts

The subject property also contains several large-diameter water production wells with electrically-powered vertical shaft pumps. The wells are poorly documented but they were generally constructed to support agricultural and livestock activities, housing, and facility operations on the property. A recent survey of these well locations indicated that several of these wells are no longer in service. Although ADWR regulations require that wells be properly abandoned once they are taken out of service, the wells are not considered to be part of the Project and cost of abandonment has not been addressed in the reclamation plan or financial assurance instrument.

4.6.7 Magma-BHP Test Facilities

The Magma-BHP test facilities consist of a small well field of injection, recovery, and observation wells, an evaporation pond, and a small process tank area adjacent to the evaporation pond. These facilities were used in BHP's hydraulic control test conducted in 1997/98. The test ran for approximately 90 days to demonstrate hydraulic control to the environmental agencies and was followed by a rinsing period of several years. ADEQ and United States Environmental Protection Agency (USEPA) allowed cessation of hydraulic control based on water quality samples following rinsing. Prior owners have not closed or remediated the facilities and the facilities exist today in approximately the same condition as when BHP terminated the hydraulic control test. The remediation and closure of the facilities is covered under financial assurance mechanisms with ADEQ, ASMI, and the USEPA.

4.7 PERMITS REQUIRED

There are several environmental permits required for the FCP. Curis Arizona has obtained, or is in the process of obtaining, the various permits required to authorize PTF and commercial operations. The list of permits is provided in Table 4-1. Below is a description of each permit, including the legal authorization, the jurisdictional agency, the purpose of the permit, the term of the permit, a brief history of the permit related to this site, and the current status of the permit.

Table 4-1: Permit List – Florence Copper In-Situ Recovery Project

Permit Name	Jurisdiction	Permit Status	Issue Date	Expiration Date	Reporting
Underground Injection Control Permit and Aquifer Exemption No. AZ 396000001	USEPA	Pending Modification Approval	5/1/1997	5 Year Review	Quarterly
Aquifer Protection Permit No. 101704 (Commercial Operations)	ADEQ	Current – Pending Amendment	8/12/2011	N/A	Quarterly
Temporary Aquifer Protection Permit No. 106360 (PTF Operations)	ADEQ	Pending Appeal	9/28/2012	2 Years From Date of Authorization to Begin Work	Quarterly
Air Quality Permit No. B31064.000	Pinal County Air Quality Control District	Current	12/16/2011	12/15/2016	Annually
Storm Water Multi-Sector General Permit Authorization No. AZMSG-61741	ADEQ	Current	5/31/2011	1/31/2016	Annually
Permit to Withdraw Groundwater for Mineral Extraction and Metallurgical Processing No. 59-562120	ADWR	Current	4/5/2010	5/31/2017	Annually
Mined Land Reclamation Plan	ASMI	In Progress	20-Yr Term	N/A	Annually
AZ State Mineral Lease #11-026500	ASLD	Current	2/24/2010	12/13/2013	Monthly
Septic System Permit	ADEQ	Current	2010[1]	N/A	N/A
Change-of Water Use Permit	ADWR	Current	2/25/1997	N/A	N/A
Burial Agreement Case No. 2012-012	Arizona State Museum	Current	6/21/2012	N/A	N/A
Programmatical Agreement	USEPA	Current	1/19/1996	30 Day Notice	N/A
EPA Hazardous Waste ID No. AZD983481599	USEPA	Current	4/4/2012 (signature date)	N/A	N/A

[1] *ADEQ gave Notice of Transfer (NOT) No. 74190*

4.7.1 Aquifer Protection Permit (APP)

4.7.1.1 Authorization, Agency, Purpose, and Term

The legal authorization for the APP is Arizona Revised Statute (A.R.S.) 49-241. The ADEQ is the authorized agency for issuing APPs. The purpose of the APP program is the protection of groundwater quality. An Individual APP is valid for the life of the project and has provisions for temporary cessation and resumption of operations. A Temporary Individual APP is valid for 12 months and allows one 12-month extension.

4.7.1.2 History

ADEQ issued an APP (No. 101704) to BHP on June 9, 1997 with stipulations that a 90-day hydraulic control test be performed and hydraulic control confirmed prior to initiating commercial production. BHP initiated their hydraulic control test in 1997 and completed the test in early 1998. BHP provided ADEQ a report, dated April 6, 1998, confirming the hydraulic control and ADEQ amended the APP to remove the hydraulic control test stipulation and effectively issued a permit for full commercial operation.

BHP deferred construction of the commercial operations due to economic considerations and elected to sell the project in 2001. The property was sold to Florence Copper Inc. (Florence Copper), a subsidiary of Merrill Ranch Investments LLC. The APP was transferred to Florence Copper after being placed into temporary cessation. The temporary cessation conditions required Florence Copper to demonstrate both technical and financial capability to ADEQ prior to initiating any commercial operation at the site. Merrill Ranch Investments maintained the APP in good standing by performing operational and quarterly monitoring and reporting until filling for bankruptcy in 2009.

Hunter Dickinson Inc. purchased the property and all mineral rights in late 2009/early 2010 and established Curis Resources (Arizona) Inc. (Curis Arizona), formerly U1 Resources, as the operating company for the FCP. Curis Arizona met with ADEQ and agreed to prepare an Other Amendment for the APP to transfer the permit and provide Curis the authority to operate a small pilot test facility. ADEQ agreed to this approach, however included the stipulation that Curis Arizona would need to submit a Significant Amendment prior to commencing commercial operations. Curis Arizona prepared and submitted an Other Amendment on May 19, 2010 and provided a letter of credit for closure in the amount of $1,066,000. This amount replaced the Florence Copper letter of credit covering closure of the existing facilities at the time Florence Copper transferred the permit (2001).

ADEQ then requested a Significant Amendment for the transfer process due to public concerns received in early 2010 and in response to the USEPA decision on transferring the UIC Permit (discussed below). Curis Arizona responded to ADEQ by submitting another Other Amendment (November 18, 2010) requesting the permit transfer, but not including the operation of a pilot test. ADEQ issued a revised permit in Curis Arizona's name on August 15, 2011. This permit does not authorize any operations until completion of a Significant Amendment.

A Significant Amendment Application ("SAA") was submitted by Curis Arizona on January 31, 2011. The SAA Application provided revised hydrologic and geochemical modeling results, updated well designs, contingency plans, and closure cost estimates in support of a phased commercial operation. Curis Arizona received comments from ADEQ on September 7, 2011; however Curis Arizona, with agreement from the ADEQ, decided to prepare and submit a Temporary Individual APP application for the PTF phase of the project and place in suspension the SAA. The Temporary Individual APP application was submitted on March 2, 2012.

4.7.1.3 Status

The current APP (No. 101704) issued to Curis Arizona in August 2011 effectively transferred the permit and requires the completion of the Significant Amendment to allow commercial operations at the site. The Temporary Individual APP (No. 106360) was issued to Curis Arizona on September 28, 2012 and allows the construction and operation of the PTF. The Significant Amendment to the Individual APP for commercial operations is in progress and is expected to be issued in mid to late 2013.

4.7.2 Underground Injection and Control Permit (UIC) and Aquifer Exemption

4.7.2.1 Authorization, Agency, Purpose, and Term

The legal authorization for the UIC is the Safe Drinking Water Act 40 USC 300f et seq., 40 CFR parts 144 and 146. The USEPA is the authorized agency for issuing UIC permits and aquifer exemptions in Arizona. One of the purposes of the UIC permit program is to allow the extraction of mineral resources using in-situ methods while protecting sources of drinking water. A UIC Permit and Aquifer Exemption are valid for the life of the project. The UIC Permit includes a requirement for review every five years.

4.7.2.2 History

USEPA issued an Aquifer Exemption and UIC Permit to BHP on May 1, 1997. The permit and aquifer exemption were transferred to Florence Copper Inc. in 2001.

4.7.2.3 Status

Curis Arizona submitted an amendment request to transfer the permit and update the Class III well designs on March 27, 2011. USEPA has provided written comments and data requests to which Curis Arizona has promptly supplied. It is anticipated that USEPA will issue the draft UIC permit in the second quarter of 2013.

4.7.3 Air Quality Permit

4.7.3.1 Authorization, Agency, Purpose, and Term

The legal authorization for the Air Quality Permit is the 40 CFR 60, 40 CFR 61, and A.R.S. 471 et seq. The Pinal County Air Quality Control District is the authorized agency for issuing air quality permits in Pinal County, Arizona. The purpose of the Air Quality Permit is to regulate the emission of pollutants to ensure these emissions do not harm public health or cause significant deterioration to the environment. The Air Quality Permit is valid for 5 years.

4.7.3.2 History

The original air permit was issued on December 16, 1996 to BHP. The permit was transferred to Florence Copper September 2002 and then transferred to Curis Arizona on June 3, 2010 with an expiration date of December 15, 2011. The permit was renewed and reissued on February 14, 2012.

4.7.3.3 Status

Curis Arizona submitted a renewal application on September 26, 2011. Comments were received from the agency on October 19, 2011 and responses were promptly submitted. The permit was renewed and reissued on February 14, 2012 and will expire on December 15, 2016.

4.7.4 Storm Water Multi-Sector General Permit

4.7.4.1 Authorization, Agency, Purpose, and Term

The legal authorization for the Storm Water Multi-Sector General Permit is 33 USC 1251 et seq: 40 CFR 122, A.R.S. 49-255. The ADEQ is the authorized agency for issuing storm water permits in Arizona, except on tribal lands. The purpose of the storm water program is to protect the water quality of waters of the U.S. The Storm Water Multi-sector General Permit is valid for 5 years.

4.7.4.2 History

Magma received a Storm Water General Permit (AZR00A224) on December 31, 1992. BHP received a Storm Water Multi-sector General Permit (AZR05A795) on January 26, 1999. Curis Arizona submitted their Notice of Intent (NOI) for coverage under the Multi-Sector General Permit on March 16, 2011.

4.7.4.3 Status

ADEQ issued an Authorization to Discharge, number AZMSG 2010-61741, to Curis Arizona on May 31, 2011.

4.7.5 Groundwater Withdrawal Permit

4.7.5.1 Authorization, Agency, Purpose, and Term

The legal authorization for the Groundwater Withdrawal Permit is A.R.S. 45-514. The ADWR is the authorized agency for issuing Groundwater Withdrawal permits in Arizona. The purpose of the Groundwater Withdrawal program is to quantify and limit the extraction of groundwater within an Active Management Area (AMA). The FCP is located within the Pinal AMA. Curis Arizona's Groundwater Withdrawal Permit is valid for 7 years.

4.7.5.2 History

The groundwater withdrawal permit was issued on June 26, 1997 to BHP and transferred to Curis Arizona on April 5, 2010 with an expiration date of May 31, 2017.

4.7.5.3 Status

The groundwater withdrawal permit was transferred to Curis Arizona on April 5, 2010 and expires on May 31, 2017. The permit allows up to 806 acre-feet per annum for use in mineral extraction and processing.

4.7.6 Mined Land Reclamation Plan

4.7.6.1 Authorization, Agency, Purpose, and Term

The legal authorization for the Mined Land Reclamation Plan is A.R.S. 27-901 et seq. The ASMI is the authorized agency for regulating Mined Land Reclamation. The purpose of the Mined Land Reclamation program is to ensure that mined lands will be left in a safe and stable post-mining condition to protect human health. The program requires financial assurance to be in place to cover expected reclamation costs. The Mined Land Reclamation plan is valid for the life of a project and requires submittal of annual status reports.

4.7.6.2 History

BHP's Mined Land Reclamation plan was accepted by the ASMI on August 28, 1997 and was transferred to Florence Copper on November 28, 2001. Curis Arizona is in the process of updating the Mined Land Reclamation plan and corresponding reclamation cost estimate.

4.7.6.3 Status

Curis Arizona is in process of updating the Mined Land Reclamation plan and corresponding reclamation cost estimate.

4.7.7 Arizona State Mineral Lease

4.7.7.1 Authorization, Agency, Purpose, and Term

The legal authorization for the Arizona State Mineral Lease is A.R.S. 37-281 et seq. The Arizona State Land Department ("ASLD") is the authorized agency for regulating Mineral Leases. The purpose of the Arizona State Land mineral management program is to regulate mining/mineral activities on State Trust land. The program requires a non-refundable filing fee per application and rental fees are required on all agreements. Royalties are paid on all recovered mineral products and appraisal or administrative fees may additionally be required. A reclamation bond is required and the actual bond amount is based upon the type of operation and the degree of disturbance. The Arizona State Mineral Lease has a 20 year term and requires submittal of annual status reports.

4.7.7.2 History

BHP's Mineral Lease was entered into on December 14, 1993 with the State of Arizona, State Land Department and was assigned to Florence Copper Inc. on December 5, 2001. The Mineral Lease was assigned to U1 Resources Inc. on February 24, 2010 and a change of the lessee's name to Curis Resources (Arizona) Inc. was acknowledged on July 27, 2010.

4.7.7.3 Status

The Arizona State Mineral Lease permit was transferred to Curis Arizona on February 24, 2010 and expires on December 13, 2013.

4.7.8 Septic System Permit

4.7.8.1 Authorization, Agency, Purpose, and Term

The legal authorization for the Septic System Permit is Arizona Administrative Code (A.A.C.) R18-9-A316. The ADEQ is the authorized agency for regulating Septic System Permits. The purpose of the Septic System Permit is for new property owners to submit a notice of transfer for the APP. The Septic System Permit is valid for the life of the current owners.

4.7.8.2 History

Curis Arizona (formerly known as U1 Resources Inc.) filed for a Septic System Permit upon change of ownership of the property. The inspection occurred March 9, 2010 and was approved by ADEQ.

4.7.8.3 Status

The ADEQ gave the Notice of Transfer No. 74190 for the septic system permit in 2010.

4.7.9 Change of Water Use Permit

4.7.9.1 Authorization, Agency, Purpose, and Term

The legal authorization for the Change of Water Use Permit was issued in United States District Court, District of Arizona. The ADWR is the authorized agency for regulating water rights and groundwater withdrawal permits. The purpose of the Change of Water Use Permit was to legally change the water use from agricultural uses to mineral extraction uses through the United States District Court, District of Arizona. The Change of Water Use Permit does not expire.

4.7.9.2 History

BHP filed the application for Change of Water Use to the Gila Water Commissioner. The change of use went before the United States District Court, District of Arizona and the motion was granted on February 25, 1997.

4.7.9.3 Status

The Change of Water Use permit was granted on February 25, 1997.

4.7.10 Burial Agreement (Case No. 2012-012)

4.7.10.1 Authorization, Agency, Purpose, and Term

The legal authorization for the Burial Agreement (Case No. 2012-012) is A.R.S. 41-865 and A.R.S. 41-844. The Arizona State Museum is the authorized agency for regulating the Burial Agreement. The purpose of the Burial Agreement (Case No. 2012-012) is for the provisions and procedures to apply in any case of discovery, treatment and disposition of remains of portions of the Escalante Ruin Group, a substantial group of Hohokam sites in the vicinity of Coolidge, AZ, as a consequence of mining development. The Burial Agreement (Case No. 2012-012) does not expire.

4.7.10.2 History

The Burial Agreement between Curis Resources Inc. and the Gila River Indian Community, the Ak-Chin Indian Community, the Salt River Pima-Maricopa Indian Community, the Tohono O'odham Nation, the Hopi Tribe and the Arizona State Museum was signed June 2012.

4.7.10.3 Status

The Burial Agreement (Case No. 2012-012) was signed April 2012.

4.7.11 Programmatic Agreement

4.7.11.1 Authorization, Agency, Purpose, and Term

The legal authorization for the Programmatic Agreement is 36 CFR Part 800 Section 106 of the National Historic Preservation Act, 16 U.S.C. 470 et seq. The Environmental Protection Agency ("EPA") and the Arizona State Historic Preservation Office ("SHPO") are the authorized agencies for regulating the Programmatic Agreement.

The purpose of the Programmatic Agreement is to establish an understanding among the USEPA, the Arizona State Historic Preservation Office, the Advisory Council on Historic Preservation, and the property owner regarding how the consultation process under section 106 will be implemented for Undertaking. The Agreement applies to all Curis Arizona activities involving the USEPA Undertaking for the area defined as the Magma Florence Mine Cultural Resources Review Area. The parties agree that the area may be amended from time to time as may be necessary to include any additional property where Curis Arizona intends to place underground injection control wells for the purposes of in-situ copper recovery.

The Programmatic Agreement does not expire. Any party to the agreement may request it to be amended in accordance with 36 CFR § 800.13. Any party to the agreement my terminate it by providing 30 days written notice to the other parties, provided that the parties will consult during the period prior to the termination to seek agreement on amendment or other actions that would avoid termination. In the event of termination, the USEPA will comply with 36 CFR §§ 800.4 through 800.6 with regard to individual undertakings covered by the Programmatic Agreement.

4.7.11.2 History

The Programmatic Agreement between Magma Copper Company and the Gila River Indian Community, the Ak-Chin Indian Community, the Salt River Pima-Maricopa Indian Community, the Tohono O'odham Nation, and the Hopi Tribe became effective January 19, 1996.

4.7.11.3 Status

The Programmatic Agreement became effective January 19, 1996.

4.7.12 USEPA Hazardous Waste

4.7.12.1 Authorization, Agency, Purpose, and Term

The legal authorization for the USEPA Hazardous Waste ID No. AZD983481599 is 40 CFR 260. The USEPA is the authorized agency for regulating Hazardous Waste ID No. AZD983481599. The purpose of the USEPA Hazardous Waste program is for regulating commercial businesses as well as Federal, State, and local government facilities that generate, transport, treat, store, or dispose of hazardous waste. The USEPA Hazardous Waste ID No. AZD983481599 does not expire.

4.7.12.2 History

Florence Copper filed a Notification of Regulated Waste Activity for subsequent notification of USEPA ID No. AZD983481599 on February 7, 2002. Curis Arizona filed a subsequent notification to update the site identification information on April 4, 2012.

4.7.12.3 Status

The USEPA Hazardous Waste ID No. AZD983481599 was signed April 4, 2012.

4.8 OTHER SIGNIFICANT FACTORS OR RISKS

Discussions are in progress with local authorities and interests to address remaining concerns with regard to permitting, land use and other project-related work. Curis Arizona plans to move forward on the Arizona State Trust land until the land use issues are resolved.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

This section discusses the physical conditions of the project site.

5.1 TOPOGRAPHY, ELEVATION AND VEGETATION

The topography of the FCP site consists of an alluvial surface that gently slopes southward. Site elevation is approximately 1,480 feet above mean sea level ("amsl"). Most desert plants are widely spaced, and their leaves are small or absent. Typical Sonoran Desert vegetation consists of short trees and shrubs. While cacti, yucca, and agave are common in selected areas around Florence, vegetation is sparse in the project area and mainly consists of creosote bushes.

5.2 CLIMATE AND LENGTH OF OPERATING SEASON

The climate in the region is typical of a semi-arid desert region with low precipitation, high summer temperatures, and low humidity. Rainfall is seasonal with peaks in winter and summer. Summer precipitation often occurs as heavy thunderstorms, locally referred to as monsoons. The annual precipitation at Florence from 1909 through 2005 ranged from 2.4 inches in 1911 to 20.01 inches in 1978. The average annual precipitation is 9.95 inches, compared with an annual evaporation rate of 92 inches. Temperatures during the summer regularly exceed 100 degrees Fahrenheit (°F). During the winter, temperatures average 50°F to 80°F. Because of high evaporation rates, only small amounts of precipitation are available for recharge to the aquifer. The climatic regime is supportive of year-round mining operations.

5.3 PHYSIOGRAPHY

The project site is located in south-central Arizona, in the Sonoran Desert of the Basin and Range Lowlands physiographic province. The region is characterized by generally northwest-trending mountain ranges separated by relatively flat valleys filled with sediments shed from the adjacent mountains. Elevations range from 1,000 to 3,000 feet amsl. Tertiary age volcanic activity in the region is responsible for occasional peaks in the intermountain valleys, such as Poston Butte north of the project area.

The project area is at an approximate elevation of 1,480 feet amsl. The principal surface water feature in the area is the Gila River, with a drainage area of approximately 58,000 square miles. The river is located about one-half mile south of the Florence copper deposit. The river is dry much of the year and flows east to west in response to regional precipitation events. Coolidge Dam, which is approximately 55 miles east of Florence, regulates 75% of the upstream watershed runoff. All upstream flow is diverted into the Florence-Casa Grande canal south of the project area, and the North canal which transects the project area.

5.4 ACCESS TO PROPERTY

The project area is approximately equidistant from Tucson and Phoenix, which are both connected by Interstate 10 (I-10). Travel north or south on I-10 as appropriate. Access from the Town of Florence is also available by paved roads. The area of the BHP ISCR field test and ancillary areas of the FCP site are accessible via all-weather graded roads and local farm roads. Figure 5-1 shows the roads available to travel to the FCP site.

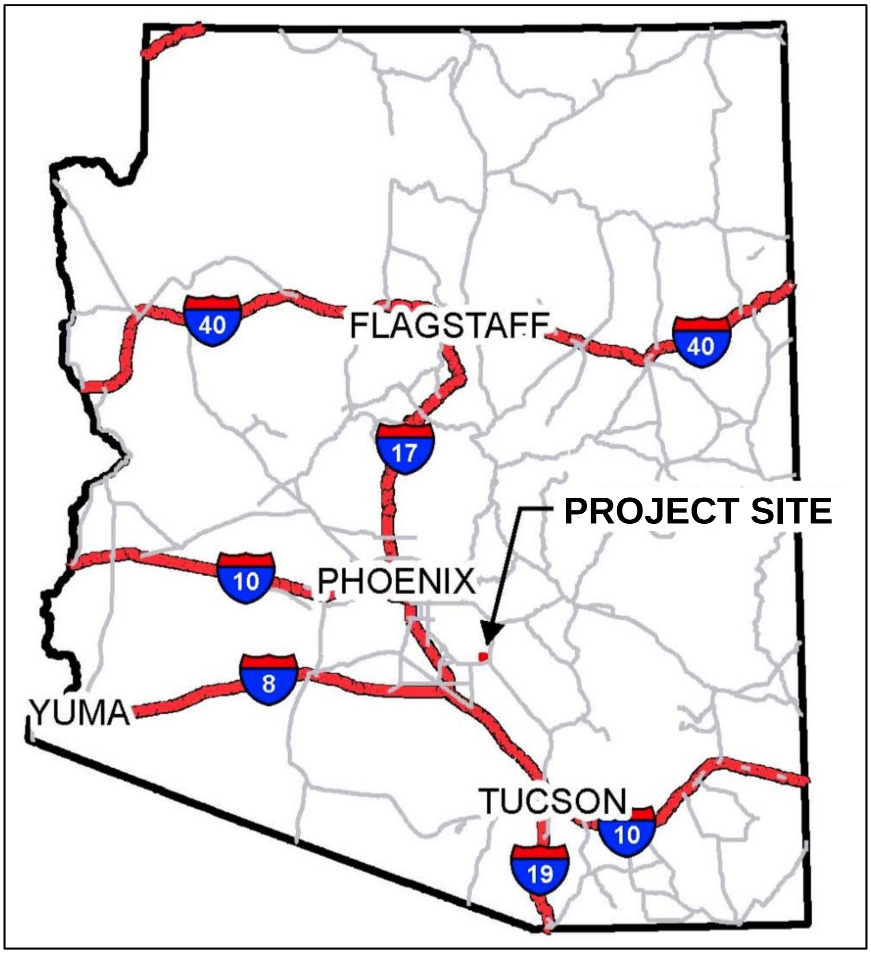


Figure 5-1: Regional Location Map

5.5 SURFACE RIGHTS

Some 1,182.59 acres of patented land constituting the project area is held in fee simple; there are no separate surface rights. A portion of the surface and mineral rights (approximately 159.5 acres) is on State Trust Lands of Arizona leased by Curis Arizona under Arizona State Mineral Lease 11-26500.

5.6 LOCAL RESOURCES AND INFRASTRUCTURE

Local infrastructure and vendor resources to support exploration, development, and mining are excellent. Exploration and mining service companies for the metals/non-metals, coal, oil, and gas industries are located in Phoenix and Tucson, and at a greater distance, in Albuquerque, New Mexico and Denver, Colorado. Locally available resources and infrastructure include power, water, communications, sewage and waste disposal, security, rail transportation, and a skilled and unskilled work force.

5.6.1 On-Site Transportation

Four-wheel-drive vehicles are recommended to access dirt roads lacking a gravel veneer during wet weather when the flat terrain becomes soft. Local access is shown on Figure 5-2. Ingress and egress to the future plant and well field facilities for light duty vehicles and commercial delivery trucks will be via Coors and Largo Roads, which are currently all-weather graded farm roads. Sections of the road will be paved prior to operations startup to minimize dust. Access to the production field test area and the future well field will be via the bridge over the North Canal. San Carlos Irrigation and Drainage District ("SCIDD") permitted BHP to upgrade the bridge so that it can accommodate all vehicles needed for operations; signs for traffic control have been installed.

One additional crossing will be required for the piping runs to the well field. Fluor Daniel Wright Ltd. ("FDW") of Vancouver prepared preliminary engineering drawings for the site including a bridge crossing that eliminates the possibility of process solution contacting canal water.

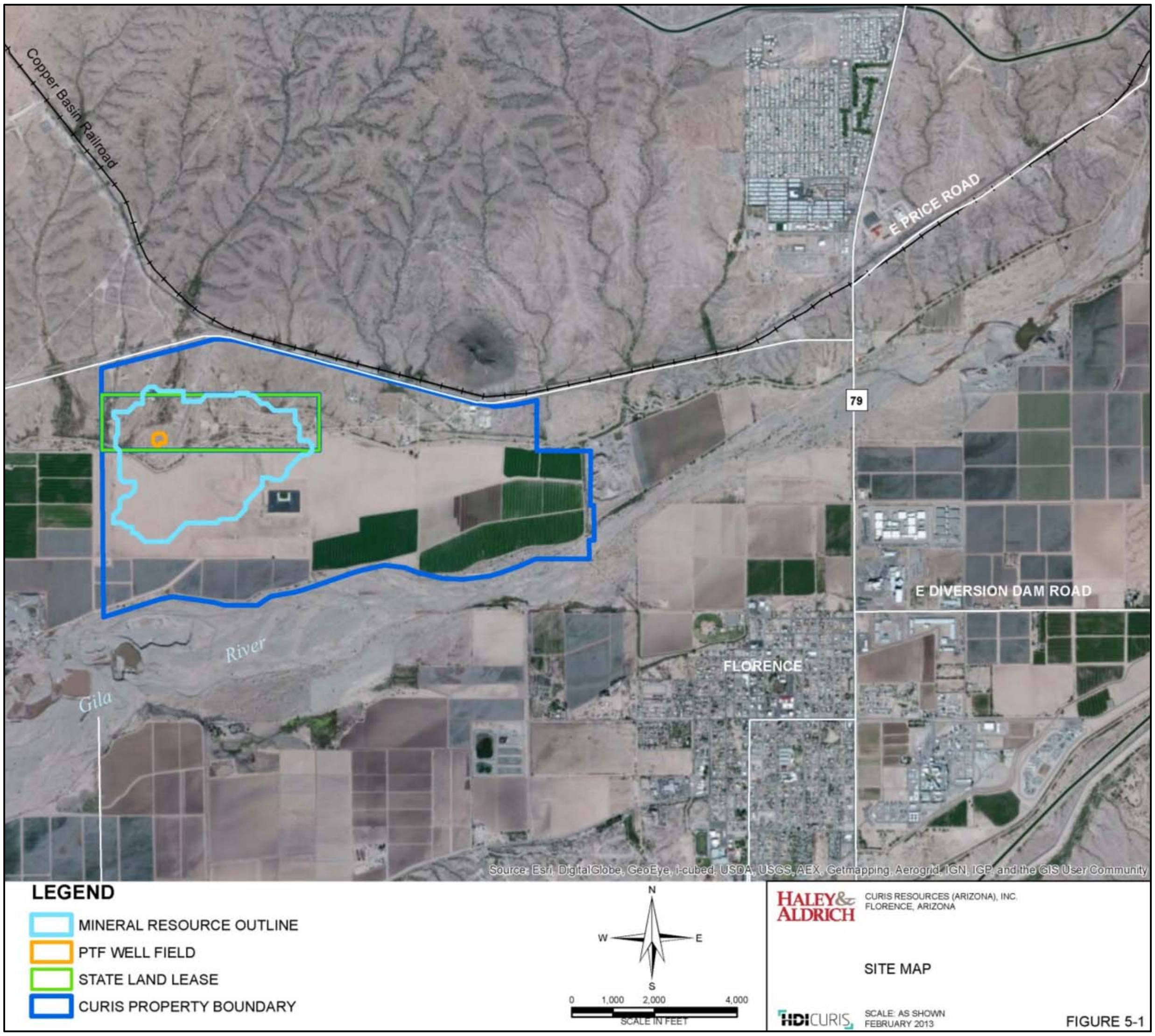


Figure 5-2: Florence Site Location Map

Note: PTF is an abbreviation for "Production Test Facility"

5.6.2 Buildings and Ancillary Facilities

The FCP site is equipped with an administrative office building, parking lot, fenced laydown yard and water tank, and a steel core-storage Quonset shed. The office building is equipped with offices; conference, map, drafting, file, and display rooms; lavatories; and a wet chemical laboratory. A portion of building was renovated in May and June 2010 for use by technical staff during the production field test. Historic documents and records are maintained in the building; the files and records were consolidated and secured during building rehabilitation activities. The core-storage Quonset has wooden and steel shelving that hold core boxes and pulp samples from previous work. This building is open to the elements via a ceiling vent and some of the cardboard boxes holding pulp samples have been adversely affected by rain. A master list in the building provides an index to the core boxes stored in this facility and their location among the shelving. The buildings are secured with locks and/or padlocks.

Additional ancillary facilities are associated with the pilot ISCR field test including Tank Farm, water impoundment, piping, and a well field. The water impoundment and Tank Farm are enclosed by a security fence and controlled access.

5.6.3 Communications and Security

Landline telephone, cellular telephone, and internet services are available at the project site.

Curis Arizona has retained a contract security company to provide security for the FCP site. The contract security firm patrols the project area, buildings, and well field because the site is currently accessible to the public and there are no fences around the site other than around the existing water impoundment and Tank Farm. During full-scale operations, the area will be maintained with a security fence and controlled access. A weigh scale will be provided at the primary entry and the security guard will serve as weigh-master.

5.6.4 Railroad

The Copper Basin Railway, a federally regulated shortline railroad located 100 feet north of Hunt Highway adjacent to the site, provides rail access between the town of Winkelman and the Union Pacific Railroad connection at the Magma loading station near I-10. The railroad has branch lines connecting the American Smelting and Refining Company (ASARCO) mine and processing facilities at Ray and Hayden in Gila and Pinal Counties, and interchanges with the San Manuel Arizona Railroad in Pinal County. The FCP site will utilize rail cars for shipments of copper cathode and rail receipt of materials for construction of the plant facilities, possibly by utilizing an existing siding located approximately one mile east of the property.

5.6.5 Power Supply

Power is currently provided directly to the project site by the San Carlos Irrigation Project (SCIP), a private company categorized under Water Distribution or Supply Systems for Irrigation. The company, established in 1930, is located in Coolidge, Arizona. SCIP obtains power from various sources including the Salt River Project (SRP), Arizona Public Service (APS), and the Western Area Power Association. Due to limitations of the SCIP power distribution system, APS will provide power directly to Curis for the duration of the project, as described further in Section 19.1.2.

5.6.6 Natural Gas

Natural gas will be required for the cathode wash system boiler and for shower facilities. Southwest Gas Company supplies natural gas in the area through an existing distribution line that runs from a termination point located a short distance to the east of the property to the El Paso Natural Gas high pressure transmission line located to the north and west of the property. Cost estimates from Southwest Gas have been included in this study for extending this distribution line to the Curis facilities.

5.6.7 Water Supply

The FCP site is within the Pinal Active Management Area ("AMA"), which is managed by the ADWR. Within the AMA, a landowner must have a groundwater right or permit to pump groundwater unless the landowner is withdrawing groundwater from an "exempt" well – defined as a well with a maximum pump capacity of 35 gallons per minute ("gpm"). The FCP has 11 exempt wells. Non-exempt wells are those wells that have a pump capacity of greater than 35 gpm and include grandfathered rights, service area rights, and withdrawal permits. The FCP has 16 non-exempt wells with grandfathered water rights that specify how groundwater can be used. The Type I non-irrigation grandfathered rights are used for land that is permanently retired from farming and converted to non-irrigation uses such as subdivisions or industrial plants; this right may be conveyed only with the land. The maximum amount of groundwater that can be pumped annually from the Type 1 non-irrigation rights acquired from Florence Copper (58-105084.0004) is 3.4 acre/feet per acre.

Wells with Type II non-irrigation grandfathered rights wells can be used for any non-irrigation purpose; the right is based on historical pumping rates and the maximum pumped in any one year from 1975 through 1980. These rights can be sold separately from the land or well. Curis Arizona has acquired from Florence Copper two such Type II non-irrigation rights (58-112949.0002 and 58-112948.0004) and the maximum amount of groundwater that can be pumped annually under these rights is 17 acre-feet per annum and 4,063.51 acre-feet per annum, respectively. Curis Arizona has filed change of well ownership forms with ADWR for its "exempt", "non-exempt", "monitor/piezometer", and "other" wells.

Water requirements for the proposed FCP were calculated by M3 to be approximately 450 gpm (725.4 acre-feet per annum). The present well that serves the office building has a capacity for 150 gpm but is inadequate for the future SX/EW plant facilities. The combined mineral extraction and irrigation groundwater rights secured by Curis Arizona and the quality of this water, however, are sufficient to supply the life of operation water needs. A stamped preliminary engineering design will need to be prepared to design a pipeline to pump the water from an existing irrigation well to the existing 100,000-gallon storage tank and planned plant location. The previous design stamped by BC was to bring water from an existing irrigation well that has been sold and is not controlled by Curis Arizona. Bottled water is currently used for drinking but engineering is underway to permit one of the existing water wells for a potable drinking water source to meet future potable drinking water requirements.

As mentioned previously, the project is within the SCIDD, which formed because of the 1924 Landowners Agreement that allocated water rights to Native Americans and others along the Gila River and North Side Canal. The agreement covered groundwater and canal water and levies fees for use of the water. BHP noted that the agreement did not allow for water use for industrial purposes so applied for a change-of-use to the agreement with the United States District Court. SCIDD and the Gila River Indian Community agreed to drop their objection to the change-of-use application if BHP would allow a right-of-way from the Central Arizona Project (CAP) Canal to the North Side Canal. BHP agreed to this as it would give the company access to its 2,200 acre-feet per year annual allotment of CAP water. In February 1997, the District Court Judge in charge of resolving water rights issues granted a permanent change-of-use that allows SCIDD area groundwater and canal water to be used for industrial purposes. BHP subsequently sold the right to the annual allotment of CAP water. Curis Arizona has sufficient water rights for the project without this allotment, and there is no need to make any changes to the North Side Canal.

5.6.8 Waste Disposal

The current site refuse is primarily office trash, which is removed to the Adamsville County landfill, located about 7 miles by road from the project site. Projected life of operation wastes will primarily be construction and office trash; dumpsters will be provided at the office building, maintenance shop, well field, and SX/EW plant with trash pickup by the Town of Florence or a private waste disposal firm. Contract drilling companies and other contractors will be responsible for their own trash removal. The mine will be a qualified as a *de minimus* or low hazardous waste generator; hazardous wastes will be minimized and are expected to be less than 100 pounds (45 kilograms) per month. A Toxicity Characteristic Leaching Procedure (“TCLP”) will be conducted on filter residues or other substances as needed to assess the concentrations of hazardous materials prior to disposal. Other materials such as used motor oil, tires, batteries, fluorescent lights, and oily rags will be sent to recycling facilities or permitted waste disposal facilities as appropriate. FDW and BC looked at the options of on-site disposal, but eliminated these options owing to the cost of permitting and other field work.

5.6.9 Manpower

Southern Arizona is an area with a long history of mining-related construction, copper exploration, mining, heap and in-place leaching, and processing with long-established vendor-support services. Labor for these activities is available in small nearby towns such as Florence, Queen Creek, Mesa, Eloy, Apache Junction, and the greater metropolitan areas of Phoenix and Tucson, Arizona. All these nearby towns can easily accommodate the necessary labor force. The cities of Tucson and Phoenix also have skilled manpower available.

6 HISTORY

There is a long history of metal exploration, mine development, milling, smelting, and leaching (heap, dump, in-place) in southern Arizona. Initially, mining occurred in underground mines and shallow surface excavations; eventually modern bulk tonnage, low-grade porphyry copper, and copper-molybdenum mines replaced the underground mines in prominence. The open pit operations are operated to process both sulfide mill mineralized material and oxide leach mineralized material similar to that found at FCP. In-place leaching on similar mineralized material types was performed for a number of years at nearby copper operations and has been used at BHP Miami since 1947.

In the early 1960s, American Smelting and Refining Company ("ASARCO") geologists noted the presence of "live limonite" along the base of Poston Butte and drilled three holes, but were unsuccessful in locating the main deposit area; the leases and claims held by ASARCO near Poston Butte were dropped. Additional historic exploration in the neighborhood of the FCP site included the Aztec, Cholla Mountain, and the Santa Cruz properties, but these are not directly connected geologically to the Florence deposit.

6.1 OWNERSHIP

The project area has had three previous owners whose primary business is exploration and mining development including Continental Oil Company ("Conoco"), Magma Copper Company ("Magma"), and BHP Copper Inc. ("BHP"). BHP conveyed the land constituting the FCP site to Florence Copper Inc. on May 26, 2000. Florence Copper Inc. was then sold to Merrill Mining LLC of Atlanta, Georgia, effective on December 5, 2001. In 2004, Roadrunner Resorts, LLC acquired the patented land owned by Florence Copper Inc. including land forming part of the FCP site. WHM Merrill Ranch Investments LLC subsequently acquired those patented lands. On January 8, 2008, Felix-Hunt Highway, LLC acquired Florence Copper Inc., the lessee under Arizona State Mineral Lease 11-26500. The annual reports of Florence Copper Inc. filed with the Arizona Corporation Commission for the years 2001 to 2009 list the main business activity of Florence Copper Inc. as "real estate". In the 2009 report dated January 28, 2010, Felix Hunt Highway, LLC is listed as owning more than 20% of the shares or Florence Copper Inc.

On March 10, 2009, certain patented land, including land comprising the FCP site, was conveyed in foreclosure proceedings to The Peoples Bank. On October 28, 2009, Merrill Ranch Properties, LLC acquired the patented land from The Peoples Bank. Curis Arizona purchased the surface rights and all of the mineral rights of some 1,182.59 acres of patented land constituting part of the FCP from Merrill Ranch Properties, LLC on December 17, 2009. On February 24, 2010, Curis Arizona obtained assignment of Arizona State Mineral Lease 11-26500. On April 14, 2010, the name of Curis Arizona was changed to from U1 Resources Inc. to Curis Resources (Arizona) Inc.

6.2 PAST EXPLORATION AND DEVELOPMENT

The Florence property was originally held by ASARCO. In the early 1960s, ASARCO drilled three holes around the edge of the deposit but none were drilled in the more mineralized portion

(S. More, oral communication, 2010). The land leases and permits held by ASARCO were subsequently dropped.

In 1969, regional reconnaissance of Arizona by Conoco led Conoco geologists to evaluate the potential copper resource at Florence. After signing land options (ASARCO retained a small lease to the west of the deposit), Conoco started drilling in March 1970 and by August 1970, core samples from drilling indicated that a potential mineralized material body had been discovered. The first drill hole was located on the southwest flank of Poston Butte, encountered oxide/silicate copper and secondary copper enrichment. Conoco implemented a drilling program to determine if there was sufficient mineralization to warrant a multi-hole exploration program. The initial drilling program did show cause to examine the deposit further. A triangular grid-drilling pattern was established and the initial holes were spaced at the 1,000-foot apexes of the equilateral triangles. Later drilling stages brought about the addition of holes spaced 500 feet apart. Finally, the 500-foot spaced drilling pattern was in-filled with holes on 250-foot centers.

Conoco envisioned a large open-pit copper mine with waste rock and tailings facilities north of Hunt Highway; they developed the project in three phases. Phase I was a study that focused on an extensive rotary and core drilling program. Phase II included a more detailed study with additional drilling. Phase III work included the development of a pilot mine, the construction and operation of a pilot plant, preliminary design of processing facilities, and various other studies required for the evaluation of project feasibility.

Between 1969 and 1975, Conoco geologists delineated an extensive, porphyry copper resource near Poston Butte. The delineation was based on 605,857 feet of exploration and development drilling in 659 holes (Nason and others, 1983). The drilling program included 396 rotary-core and 263 rotary-only drill holes. Approximately one-half of the holes were drilled into the main portion of the mineral deposit, with the remainder drilled into peripheral areas primarily for site condemnation.

In 1974, Conoco mined over 50,000 tons of mineralized quartz monzonite from a single-level, underground mine designed for metallurgical mining and geological testing. The mine included one mile of drifts and two vertical shafts for ventilation and hauling mineralized material to the surface. The shaft infrastructure was later removed and the openings sealed with concrete. Metallurgical testing of the recovered material was performed using a small pilot plant built on the property. The pilot mine is now sealed and flooded. Development drilling ceased in 1975 and the project was forced into dormancy owing to a low copper price ($0.50/lb) at the time and the relatively large capital investment. Conoco invested $27 million in project studies, drilling, engineering designs, and construction of a pilot plant and underground mine. The property remained idle for nearly two decades thereafter.

Magma acquired the property from Conoco in July 1992 for $9 million and initiated a Pre-Feasibility Study in January 1993 to verify the Conoco work and to determine the most effective technology for extracting copper from the deposit. Magma drilled an additional 23 holes into bedrock as part of its verification program during the Pre-Feasibility Study (1993-1995). There were no fatal flaws encountered regarding the accuracy or consistency of the Conoco data. A detailed description of the results of these comparisons can be found in Magma's Pre-Feasibility report (Magma, 1994).

The Pre-Feasibility Study focused on identifying the most appropriate mining method for developing the oxide portion of the deposit. The methods evaluated were: (1) open pit mining followed by heap leaching and SX/EW, and (2) in-situ solution mining followed by SX/EW. Parallel studies were performed by Magma personnel and by Independent Mining Consultants (IMC) of Tucson, Arizona (contracted by Magma). Magma personnel evaluated the in-situ potential of the project while IMC evaluated the open pit scenario.

Magma also drilled 12 holes for material properties testing purposes (pumping tests), and two large-diameter (6-inch) holes for obtaining bulk samples for metallurgical testing; the large-diameter holes (MCC-533 and MCC-534) were completed during the early stages of the feasibility study. These additional holes were drilled into the central portion of the deposit for a total footage of 10,892 feet.

An exploration program was implemented to drill five holes (8,280 feet) in Section 22, located about 2 miles northeast of the Florence deposit. Land access issues had prevented drilling prior to this time. Near-surface outcrops and subcrops of acid soluble copper mineralization were the targets of this program. The geologic target was proposed to be a small, faulted segment of the large-scale Florence porphyry copper system. Drilling confirmed the presence of propylitic alteration and low-grade, erratic, copper sulfide mineralization. No copper mineralization of economic grade was encountered.

The Pre-Feasibility Study was completed in January 1995 (Magma, 1994) at an approximate cost of $2.2 million. The results from copper resource modeling, metallurgical testing, material property testing, and financial analysis supported the conclusion that the application of in-situ leaching and SX/EW to produce cathode copper was the preferred method to develop the Florence deposit. The lithologic, mineralogical, and structural features are all favorable to solution mining because of the low acid-consuming potential of the host rock, the presence of acid-soluble chrysocolla located along fractures and in argillized feldspars, and the intense fracturing of the rock which allows solution migration.

The recommendation was made to proceed with a feasibility study that would provide mineralized material reserves, permitting, detailed in-situ mine design, and facility engineering capable of advancing the project to the construction stage.

In January 1996, Broken Hill Proprietary Company Limited of Australia acquired Magma and created BHP. The feasibility study started by Magma in January 1995 continued through the acquisition phase. The study included a drilling program of 67 holes drilled into the deposit and surrounding area to serve as pumping, observation, and monitoring wells. These wells were drilled to provide hydrologic data for the Aquifer Protection Permit (APP) application and to characterize the aquifer in the hydrologic computer model. An additional 38 diamond drill holes were completed to confirm geologic resources in the deeper, western portion of the deposit and to gather material for geological and metallurgical tests.

In 1998, BHP conducted a multi-month field optimization ISCR test to gather copper recovery and other technical data for final feasibility. The outcome of the study confirmed that production wells could be efficiently installed into the mineralized zone, hydraulic control of the injected process solutions could be maintained and documented, and that the ISCR method was still the preferred method.

6.3 HISTORICAL MINERAL RESOURCE AND RESERVE ESTIMATES

The following section includes historic estimates of mineral reserves and resources provided as background information only. The source of information for historic resources includes an unpublished internal report with appendices prepared by Magma's internal Resource Development Technology Group (RDTG) in 1995. BHP prepared numerous memoranda documenting internal protocols and methods for generating the drill hole database, geology block model, and mineral resource estimation; much of these protocols, methods, and information including the declaration of mineral resources were compiled in an internal, unpublished report with appendices prepared in 1997. In addition, Curis Arizona is also in possession of the digital MineSight geology model, resource estimation routines, and resource model. The historical resources stated by Magma and BHP used the same resource categories (Measured, Indicated, and Inferred) that are used in the current declaration of mineral resources. See Section 14 for estimates of the current mineral resources.

The Magma 1994 Pre-Feasibility Study (Magma, 1994) reported an oxide resource of 368.16 million tons (333.98 million tonnes) of 0.34% TCu and 0.24% acid soluble copper (%ASCu) using a 0.1% ASCu cutoff grade.[1] Of this total, 323.49 million tons (87.8%) were classified as measured and indicated resources based on a composite-to-block distance of less than 250 feet. These figures were for a total resource within a 3.94 square mile area and were not constrained within any permit boundaries.

The BHP Pre-Feasibility Study (BHP, 1997a) reported the measured and indicated oxide mineral resource at 321.28 million tons (291.46 million tonnes) of 0.38% TCu and 0.23% ASCu grade at a 0.15% TCu cutoff (Table 6-1), containing 2.42 billion pounds of copper. These figures were for a resource within the APP and Underground Injection Control (UIC) Permit area, which is 1.04 square miles. A cutoff grade of 0.15% TCu was selected for the resource estimate because BHP initially assumed negligible copper production would likely occur below 0.15% TCu or in the high-iron leached cap owing to the presence of difficult-soluble minerals and relatively higher acid-consumption rates. BHP (1997c) stated there is some potential to extract copper from low-grade portions of the high-iron zone, so using a lower %TCu cutoff grade may be appropriate. They had insufficient metallurgical test work on material having a grade less than 0.15% TCu, so did not include it in the estimates of recoverable copper.

[1] The %ASCu component of the sample assay is an empirical measure of the percentage of total copper that is dissolved by dilute sulfuric acid under specified time and temperature conditions. For the Florence assays performed by Magma and BHP, the %ASCU values are the result of exposing 5 grams of sample pulp materials to a 15% concentration of sulfuric acid for 5 minutes in a water bath held at 73 degrees Celsius. The results allow for relative comparison of the ratio of TCu:ASCu in various rock materials in the deposit and do not reflect the ultimate copper recovery in oxidized materials under field leaching conditions

The BHP mineral resource estimate was completed in-house according to guidelines and standards published by *The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves* (AusIMM JORC, 1996a, b). Although the BHP resource estimate may have been completed using best resource estimation practices in effect at the time and many of the methods used are still relevant, these historical resources are not being presented by Curis Arizona as current nor Canadian Institute of Mining, Metallurgy, and Petroleum (CIM)-compliant resources. SRK has audited the historical resources and made modifications to the resource estimation methods as described in Section 14. The historical resources reported in this section are presented for comparative information only and should not be relied upon. The issuer is not treating the historical estimate as the current mineral resources as defined in Title 1.2 of NI43-101 (CSA, 2011). The current mineral resources stated in compliance with 43-101 are reported in Section 14 of this report.

Table 6-1: BHP Historical Estimate of Total Measured and Indicated Oxide Mineral Resources, within the Permit Area

KTons	TCu (%)	ASCu (%)	%Total	Distance to Composite	Resource Category
313,160	0.378	0.232	97.5	<150 feet	Measured
8,120	0.295	0.146	2.5	150-250 feet	Indicated
321,280	**0.376**	**0.230**	**100.0**		**Total**

Source: BHP, 1997a. Note that the 1997 resource estimate is historical in nature and is based on prior data and reports prepared by BHP

The BHP historical estimate was based on a database that contained the following information:

- 795 boreholes drilled by Conoco, Magma, and BHP from the 1960s to 1997 including exploration drill holes, and wells used for geotechnical, piezometer, aquifer testing, compliance monitoring, non-irrigation water production, and in-situ production purposes.
- 112 new holes included in the tally above were added by BHP from 1995 to 1997 and consisted of 45 core diamond drill holes (resource confirmation, metallurgical samples, first five field test wells), 33 monitor wells (including 16 point-of-compliance wells), and 34 pumping and observation wells.
- 74,495 total copper assays in the model area with a drill spacing of approximately 250 feet.
- 274 drill holes within the permit area, with 14,586 TCu assays and 13,760 ASCu assays in the oxide bedrock.
- 1,857 re-assayed Conoco pulps from an area proposed as the first mining cell.

Although the BHP mineral resource model built on the work of the 1994 Magma Pre-Feasibility model, the BHP model cannot be directly compared to the Magma Pre-Feasibility model. The two main reasons are: (1) the 1994 model reported mineral resources with respect to an ASCu grade cutoff instead of the TCu grade cutoff used in the BHP model; and (2) the Conoco model covered a much larger area (3.94 square miles instead of 1.04 square mile). Other changes included the additional 112 drill holes and assays added by 1997 and the use of different interpolation techniques.

6.4 HISTORICAL PRODUCTION

There has been no commercial production of copper from the FCP site historically.

7 GEOLOGICAL SETTING AND MINERALIZATION

The regional, local, and property geology and mineralization are discussed in this section. A regional geology map is provided in Figure 7-1. A representative plan map is shown in Figure 7-2, and representative profiles showing the local geology are shown in Figure 7-3 and Figure 7-4.

7.1 REGIONAL GEOLOGY

This section provides a description of the regional geologic setting of the FCP area, summarized from BC (1996a, v. II, p. 3-8 to 3-10) and from SRK (2010).

The Mazatzal Orogeny, a compressional deformation event that occurred about 1,670 million years ago (Ma) in central to southeast Arizona, accreted three tectonic assemblages to the North American craton, and formed the early Precambrian crust. This event involved thrust and reverse faulting and large-scale folding (Anderson, 1989). The three different tectonic assemblages formed in Arizona at this time include the Pinal Schist (1,750-1650 Ma), which forms the basement rock in the region surrounding the Project area.

The Mazatzal Orogeny was followed by a period during which erosion was the dominant geological process. Around 1,400 Ma, thermal instability in the upper mantle resulted in deep crustal melting and widespread emplacement of potassium-rich granites into the upper crust (Anderson, 1989). The Oracle Granite batholith intruded the Pinal Schist during this time. The Oracle Granite, locally represented by quartz monzonite porphyry, is the main host for mineralization at the FCP area.

The Grand Canyon Disturbance (900-800 Ma) occurred at the end of the Precambrian Era. This orogeny resulted in uplifting and tilting of the crust, with extensive intrusion of diabase sills and dikes (Wilson, 1962). Dikes of this nature intrude the Oracle Granite and Pinal Schist.

As a result of regional stresses that occurred throughout the late Precambrian and into early Paleozoic time, east-northeast trending structural lineaments formed in the western continental crust (Anderson and others, 1971). One such structure in southern Arizona is the Ray Lineament, which trends N. 70° E. and extends approximately 50 miles from the Sacaton Mountains to the Pinal Mountains. The Ray Lineament trends west-southwest through the FCP area and is parallel to the Pinal Schist-Oracle Granite contact (Conoco, 1976). At Florence, the lineament intersects a pre-existing Precambrian diabase dike swarm that strikes N. 10-30° W. (Conoco, 1976). After the initial formation of the Ray Lineament and related discontinuities, a long period of erosion produced a peneplain landscape.

Significant orogenic activity did not re-occur in Arizona until the latter part of the Cretaceous Period. The Laramide Orogeny occurred during Late Cretaceous through Early Tertiary time (80 to 50 Ma). The event involved regional-scale thrust faulting and folding in southern Arizona (Dickinson, 1989). Reactivation of normal faults produced large northeast-trending vertical block uplifts associated with the emplacement of scattered plutons in western and southern Arizona (Anderson and others, 1971). Intrusions, principally of granodiorite porphyry and quartz monzonite porphyry, occurred along the Ray Lineament. Hydrothermal mineralization associated with these intrusions resulted in the formation of porphyry copper deposits (Dickinson, 1989). The Florence copper deposit was formed in this fashion as the Precambrian Oracle Granite was intruded and mineralized in association with the emplacement of Tertiary granodiorite porphyry. Following the formation of the Florence deposit, un-mineralized dikes consisting of latite, dacite, andesite, quartz latite, and basalt intruded the Oracle Granite and the granodiorite.

Continued Laramide activity produced faulting and uplift, resulting in the erosion of Paleozoic and Mesozoic sedimentary sequences. This erosion also exposed the Precambrian and Tertiary intrusive bodies. Oxidation and further erosion occurred on these surfaces, followed by the accumulation of coarse clastic sediments derived from the surrounding bedrock terrain. This depositional sequence ultimately produced a landscape of low relative relief. Precambrian-age outcrops exposed in the surrounding area as a result of the Laramide Orogeny include the Pinal Schist and the Oracle Granite (Nason and others, 1982). Exposed Tertiary-age intrusive rocks include the Sacaton Stock and granodiorite porphyry (62 ± 1.0 Ma). Most copper mineralization in the area occurs within the quartz monzonite porphyry and granodiorite porphyry.

As the uplifted surface began to erode, a sedimentary sequence was deposited over the Precambrian units during the Oligocene through Early Miocene (36 to 17 Ma). These deposits are composed of deeply weathered bedrock or grus-type deposits, as well as coarse, angular breccias or gravels. Sediments became finer grained as the topography matured. The basal breccia/conglomerate is commonly overlain by finer-grained silts and sands, and locally interbedded with lava flows or volcanic ash. Alluvial, fluvial, and lacustrine (both lake bed and playa) sediments accumulated during this time in southeast Arizona. Tertiary-age sediments are not believed to exist in the FCP area because of erosion, subsequent uplift, and faulting. It is possible that such sediments are preserved in the deeper portions of the graben to the west of the deposit area, or in the basin center to the south.

The last major orogenic event to affect the area was the Basin and Range Orogeny, an extensional event occurring from the early Miocene to the Pleistocene (17-5 Ma). Basin and Range faulting and tilting in the FCP area resulted in north-northwest trending horst and graben structures bounded by normal faults with large displacements to the west (Nason and others, 1982). The Florence deposit occurs on a horst block that is bounded on the east and west by grabens. The Party Line fault, a major normal fault on the east side of the deposit, strikes north 35 degrees west and dips 45 to 55 degrees southwest. This fault is reported to have a vertical displacement of over 1,000 feet (Conoco, 1976; Nason and others, 1982). Near-parallel normal faults that strike north to northwest lie west of the Party Line fault.

The Sidewinder fault occurs near the west side of the Project area and has a displacement in excess of 1,200 feet (Conoco, 1976). This fault represents a continuation of a complex of north-south trending normal faults to the east. The north-south fault system has downthrown the south end of the horst approximately 1,500 feet (Conoco, 1976). Additional parallel, north to northwest trending normal faults east of the Sidewinder fault produce a graben east of the FCP area. The graben strikes north to northwest and extends for about 5 miles or more.

Post-Basin and Range basin-fill sediments were deposited over the bedrock surface. The sediments consist of unconsolidated to moderately well consolidated interbedded clay, silt, sand,

and gravel in variable proportions and thicknesses. Basalt flows are interbedded on the west and northwest portions of the deposit area. Total thickness of basin-fill materials near the FCP area ranges from 300 to over 900 feet, and exceeds 2,000 feet at a distance of 1.5 miles southwest of the deposit area.

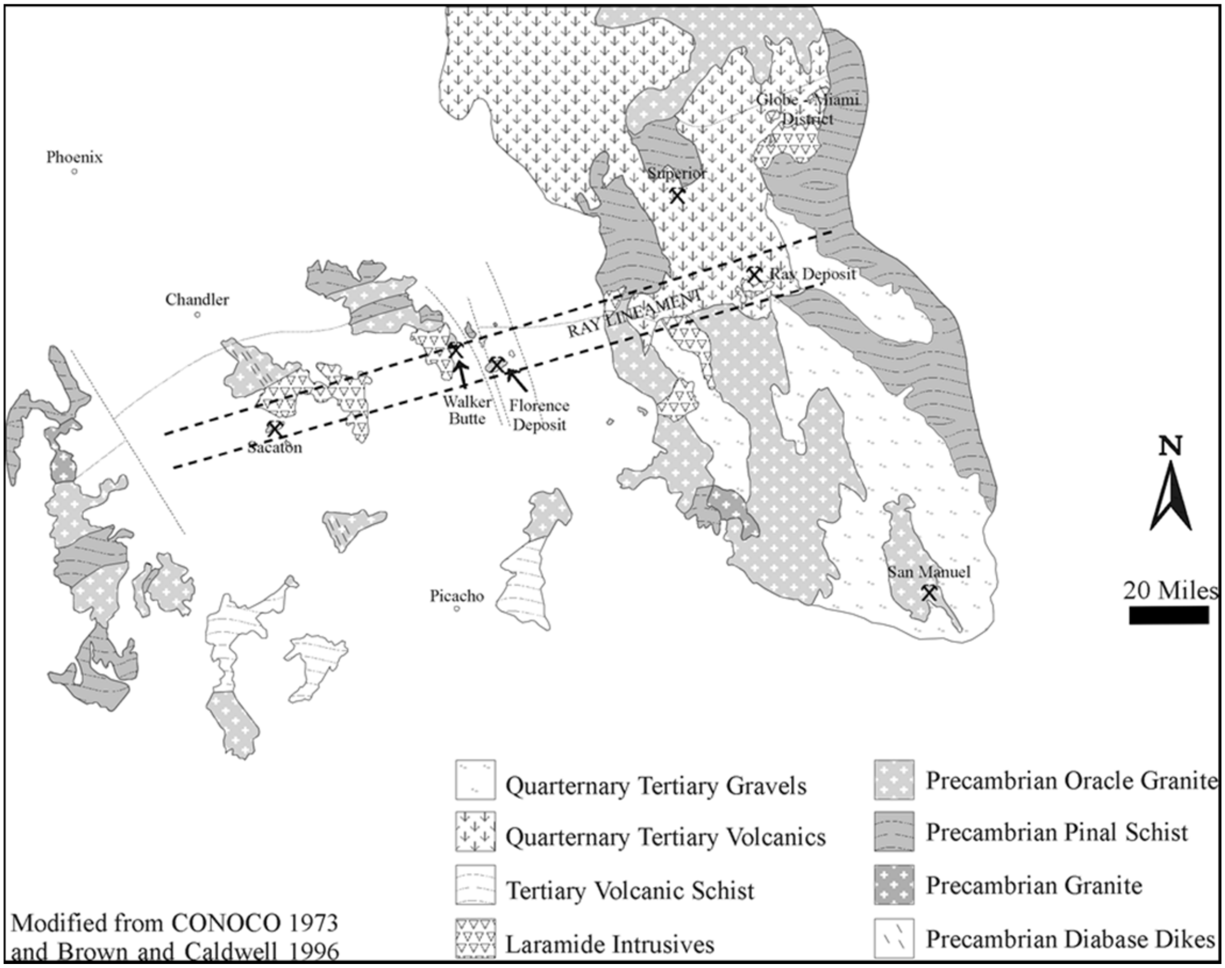


Figure 7-1: Regional Geology Map

7.2 LOCAL GEOLOGY

The Florence porphyry copper deposit formed when numerous Laramide-age dike swarms of granodiorite porphyry (Tgdp) intruded Precambrian quartz monzonite (Yqm) near Poston Butte (see geologic plan map in Figure 7-2 and cross sections in Figure 7-3 and Figure 7-4). The dike swarms were fed by a larger intrusive mass at depth. Hydrothermal solutions associated with the intrusive dikes altered the host rock and deposited copper and iron sulfide minerals in disseminations and thin veinlets. Hydrothermal alteration and copper mineralization were most intense along the edges and flanks of the dike swarms and intrusive mass.

The region was later faulted and much of the Florence deposit was isolated as a horst block. This horst block, as well as the downthrown fault blocks to the west, was exposed to weathering and erosion. The center of the deposit was eventually eroded to a gently undulating topographic surface while a deep basin formed to the west.

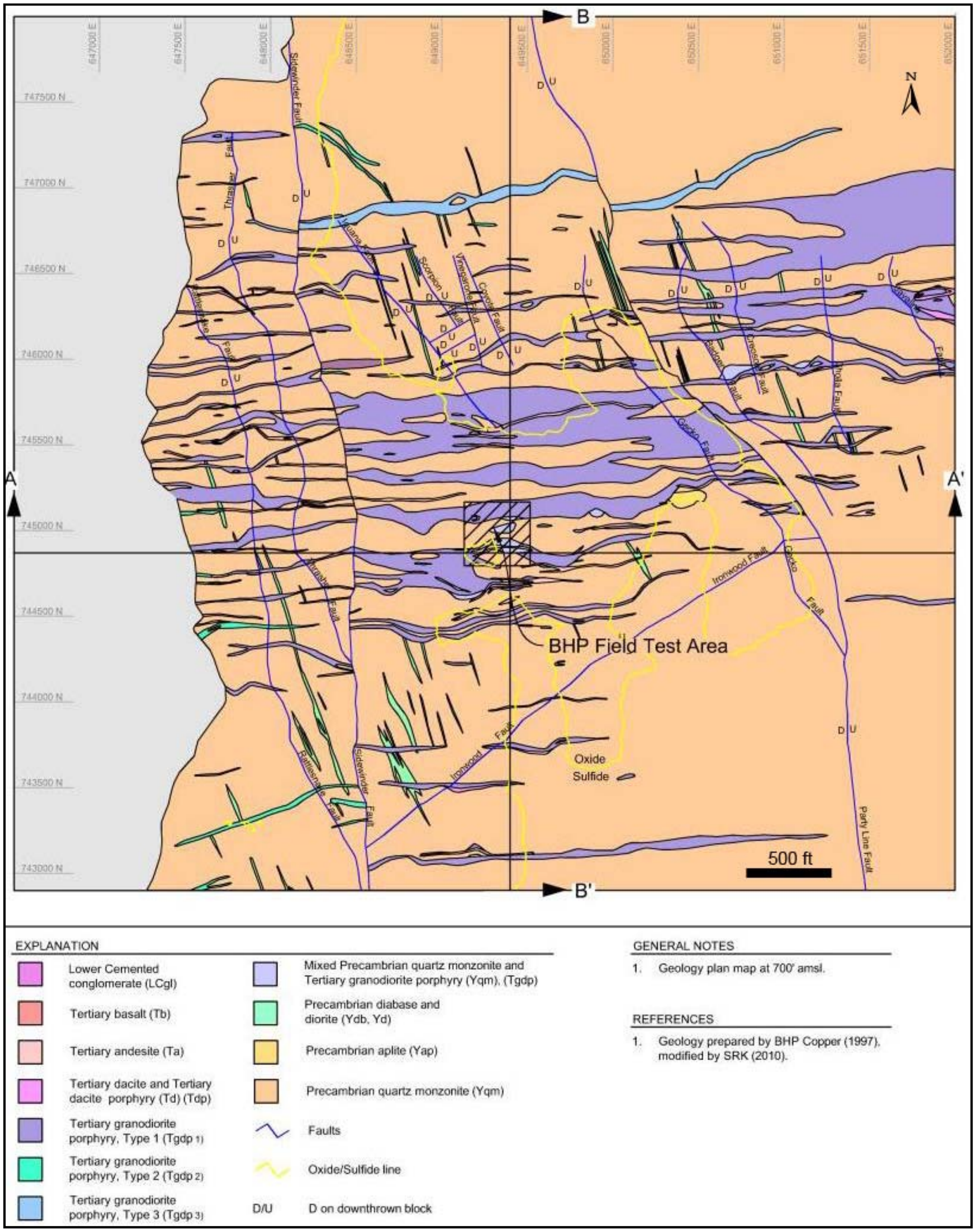
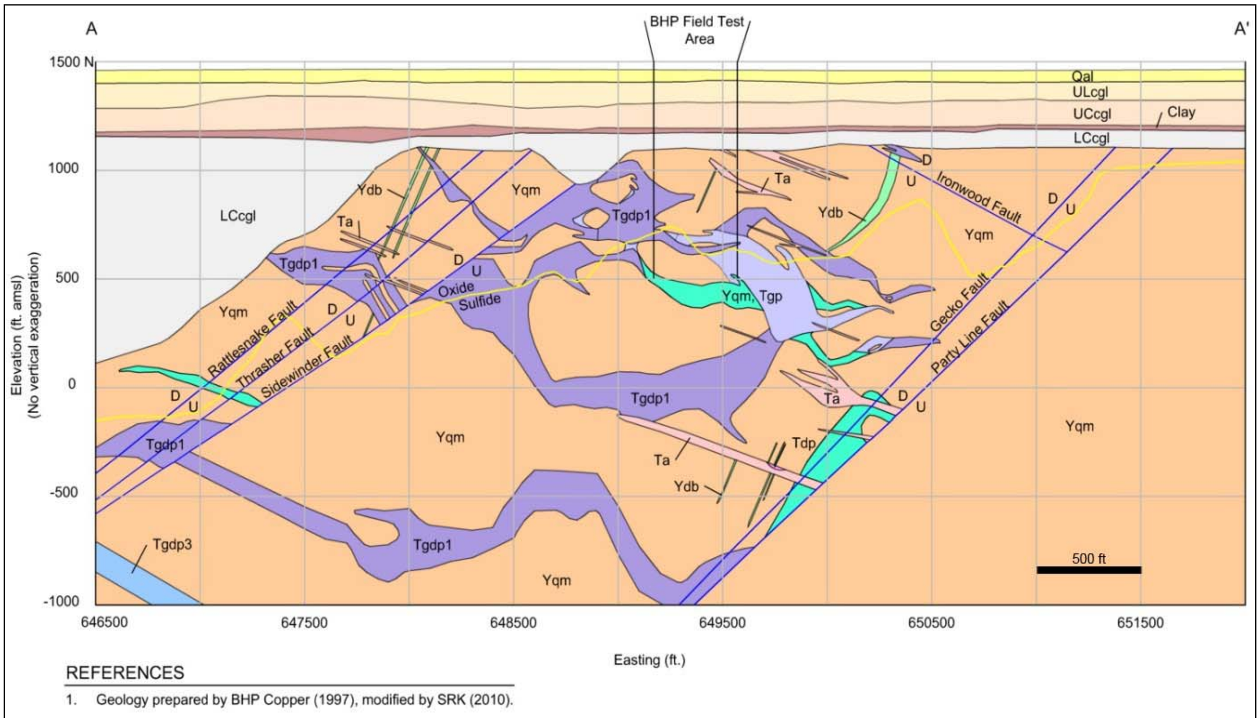
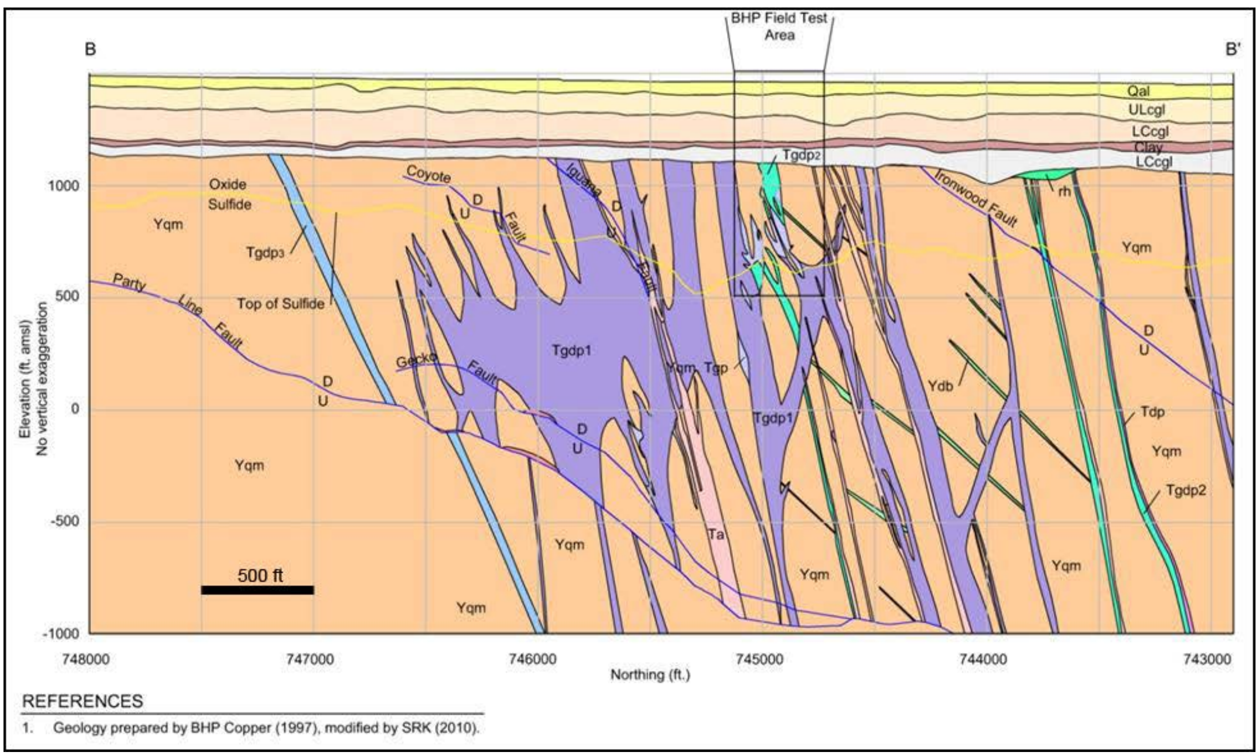


Figure 7-2: Geology Plan Map at 700 feet Above Mean Sea Level (SRK, 2010)



*Note: See Figure 7-2 for geological legend

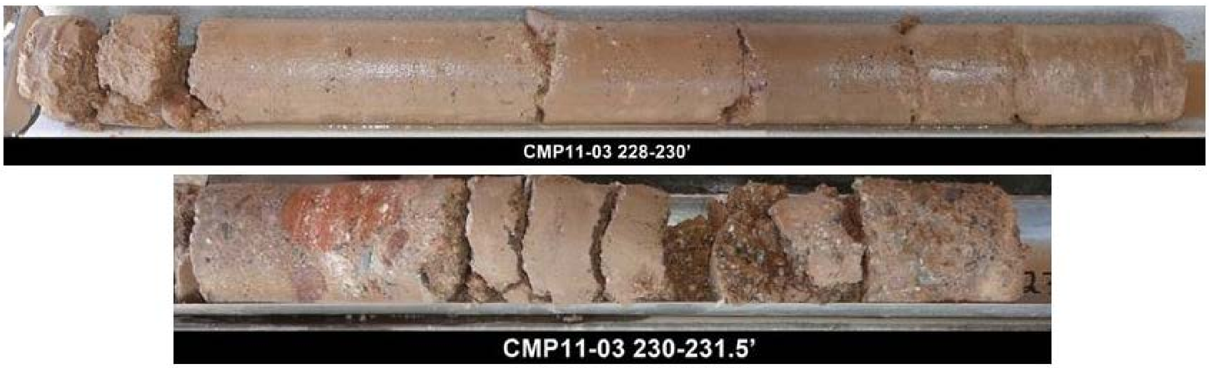
Figure 7-3: East-west Geology Cross Section at 744870N Looking North (SRK, 2010)



*Note: See Figure 7-2 for geological legend

Figure 7-4: North-South Geology Cross Section at 649500E Looking East (SRK, 2010)

The copper sulfide minerals were oxidized and converted to chrysocolla, tenorite, chalcocite, and minor native copper and cuprite. A majority of the copper oxide mineralization is located along fracture surfaces, but chrysocolla and copper-bearing clay minerals also replace feldspar minerals internal in the granodiorite porphyry and quartz monzonite. A barren or very low-grade zone, dominated by iron and manganese oxides/silicates and clay minerals, caps some portions of the top of bedrock. The mineralization is typical of most Arizona porphyry copper deposits. The thickness of the oxide zone ranges from 100 to 1,200 feet, with an average thickness of 400 feet. Representative photos of rock and mineralization types from Curis Arizona's recent drilling program are shown in Figure 7-5 and Figure 7-6.



Notes: PQ-diameter core from Curis Arizona's 2011 drilling program. Photos of CMP11-03 show the middle fine-grained (clay) unit (228-230') and the poorly consolidated, unlithified lower basin-fill unit with variable conglomerate clasts and a silty, sandy matrix (230-231.5').

Figure 7-5: 2011 PQ Core – Middle Fine-Grained Unit and Lower Basin Fill

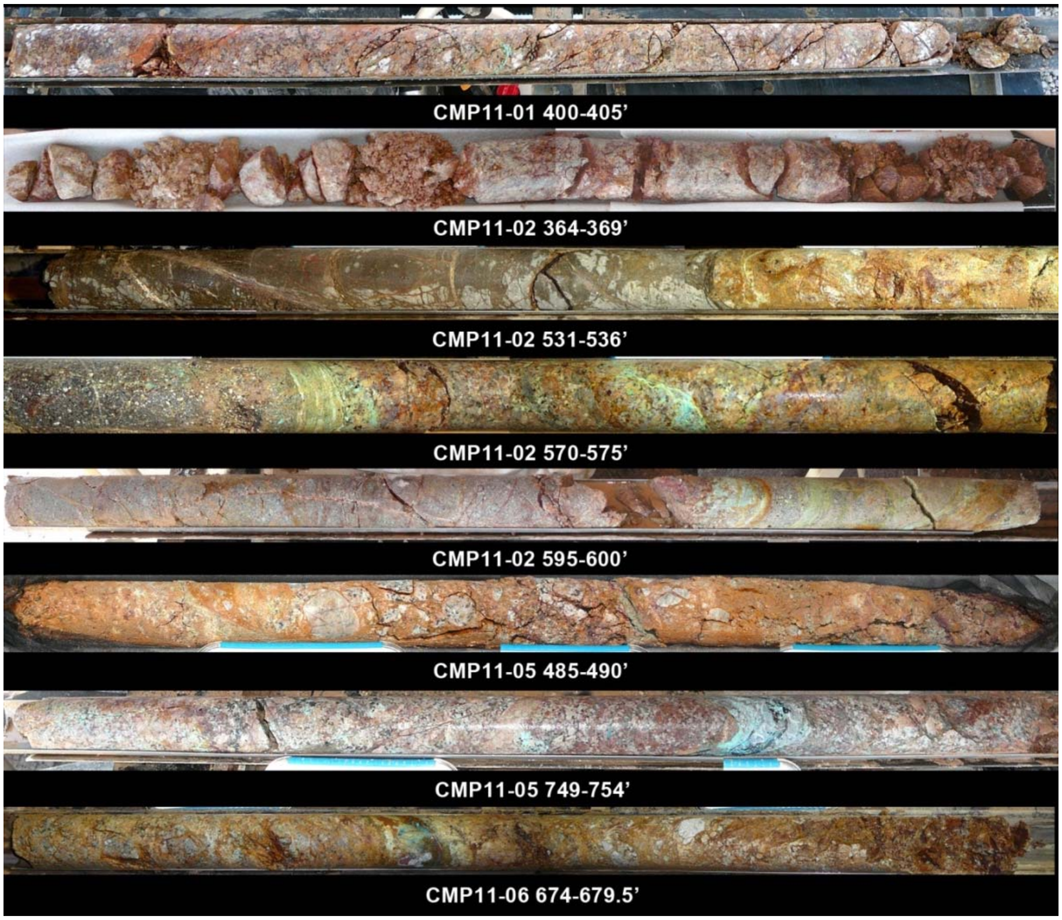


Figure 7-6: 2011 PQ Core- Bedrock Formations

CMP11-01 400-405' – PQ core 5-foot core barrel, fractured Precambrian quartz monzonite porphyry approximately 25' below top of bedrock, Metzone=2 (Mixed copper/iron oxides), FRACI=2 (6-10 fx/ft), chrysocolla vein in center of photograph.

CMP11-02 364-369' – Coarse-grained, equigranular to coarsely porphyritic, fractured Precambrian quartz monzonite porphyry, Metzone=2 (Mixed copper/iron oxides), FRACI=3 (11-15 fx/ft), abundant hematite and goethite. Plagioclase is replaced by sericite, kaolinite, and copper clays.

CMP11-02 531-536' – Contact of finely micro-cracked Tertiary andesite/latite (left) with bleached, clay altered Precambrian quartz monzonite porphyry (right); abundant goethite and clay on fractures. Intrusive contact is at 70 degrees to core axis. Metzone=2 (Mixed copper/iron oxides), FRACI=4 (>15 fx/ft). Black neotocite and tenorite coat fractures and veins at contact.

CMP11-02 570-575' – Finger of medium gray Tertiary granodiorite porphyry (Tgdp). Bleached intrusive contact (60 degrees to core axis) with highly mineralized quartz monzonite porphyry (Yqm) to end of run. Metzone=2 (Mixed copper/iron oxides), FRACI=2 (6-10 fx/ft). Chrysocolla and copper clay coats fractures and is present in veins and as replacements of plagioclase grains.

CMP11-02 595-600' – Thin dike of porphyritic, dark gray Tgdp. Goethite and hematite on fractures. Chrysocolla and copper-clay veins. Metzone=1 (Copper oxide dominate), FRACI=1 (0-5 fx/ft).

CMP11-05 485-490' – Milled fault breccia with sub-angular to sub-rounded clasts of Precambrian quartz monzonite porphyry embedded in gritty, goethite stained gouge zone. Metzone= 2; FRACI=5 (fault).

CMP11-05 749-754' – Coarse-grained porphyritic Yqm with hematite and goethite pervasively replacing portions of the matrix. Chrysocolla and tenorite veins and clots at 751.5'. Sericite selvage around potassium feldspar veins. Metzone=1 (copper oxides), FRACI=1 (0-5 fx/ft).

CMP11-06 674-679.5' – Coarse-grained porphyritic Yqm with goethite. Fault breccia at 40 degrees to the core axis. Chrysocolla is present in veins and fracture coatings. Metzone=3 (high-iron), FRACI=5 (fault).

7.2.1 Structure

The regional structure has been previously described by Balla (1972) and Nason and others (1983). These authors suggest that the oldest structural trend affecting the Florence deposit is the N.70°E.-trending Ray Lineament (see lineament depicted in Figure 7-1) – a pre-Laramide zone of crustal weakness that can be traced east-northeast from Sacaton through Walker Butte, Florence, and on to Ray. The northeast-trending fracture patterns related to this regional structure are recorded at the Florence deposit on Conoco's underground maps and in oriented drill core drilled and logged by Magma and BHP. Laramide intrusions are interpreted from these data to have been emplaced and elongated in an east-northeast direction at the intersections of conjugate fault sets that intersect the Ray Lineament. At Florence, the Type I (Tgdp1) and Type III (Tgdp2) granodiorite intrusions are both elongated in a northeast to east-northeast direction. Northwest-trending en echelon Precambrian diabase dikes (Ydb) suggest a conjugate structural direction.

The most evident structures in the Florence area are related to post-Laramide Basin and Range faulting. These post-mineralization faults, intersected sub-surface in drill core, are the Party Line and Sidewinder faults and associated sub-parallel faults (Figure 7-7). The Party Line fault is a fault zone 50 to 100 feet wide striking N. 34ºW, dipping -45º to -50ºW with a vertical displacement of 800 to 1,000 feet. The Party Line fault bounds the eastern portion of the deposit and has a strike length in excess of 3,600 feet. The Party Line fault is the main control of economically mineable copper oxide mineralization on the east side of the deposit; the footwall east of the fault is not economically mineable. Associated with the Party Line fault is a series of normal faults striking north to north-northwest that have displaced the deposit down to the west over 1,200 feet (Figure 7-7).

The Sidewinder fault, which also can be traced sub-surface for thousands of feet, bounds the western edge of the deposit. Displacement in the central deposit area reaches a maximum of 1,200 feet, displacement increases south of the deposit to a maximum of 1,500 feet. The offset along the associated fault zone is approximately 250 feet; the hanging wall has been intensely fractured. The Sidewinder fault formed a structural zone of weakness that facilitated the development of a north-northwest trending paleo-valley within the deposit that is as much as 200 feet deep and has been traced over a strike length of 2,500 feet. Several other north-northwest trending faults have been postulated between the Party Line and Sidewinder faults. At least two fault structures have been identified in the hanging wall of the Sidewinder fault, informally named the Thrasher and Rattlesnake faults. The faults are predominantly identified by the presence of milled, rotated breccia fragments; clay gouge is noted on many fault surfaces but is of much less abundant than is volume of the brecciated rock.

Statistical analysis of drill core indicates an average of 11 to 15 open fractures per foot in the fractured oxide zone underlying the unconsolidated material. The sulfide zone underlies the oxide zone and is significantly less permeable, with an average of 6 to 10 open fractures per foot.

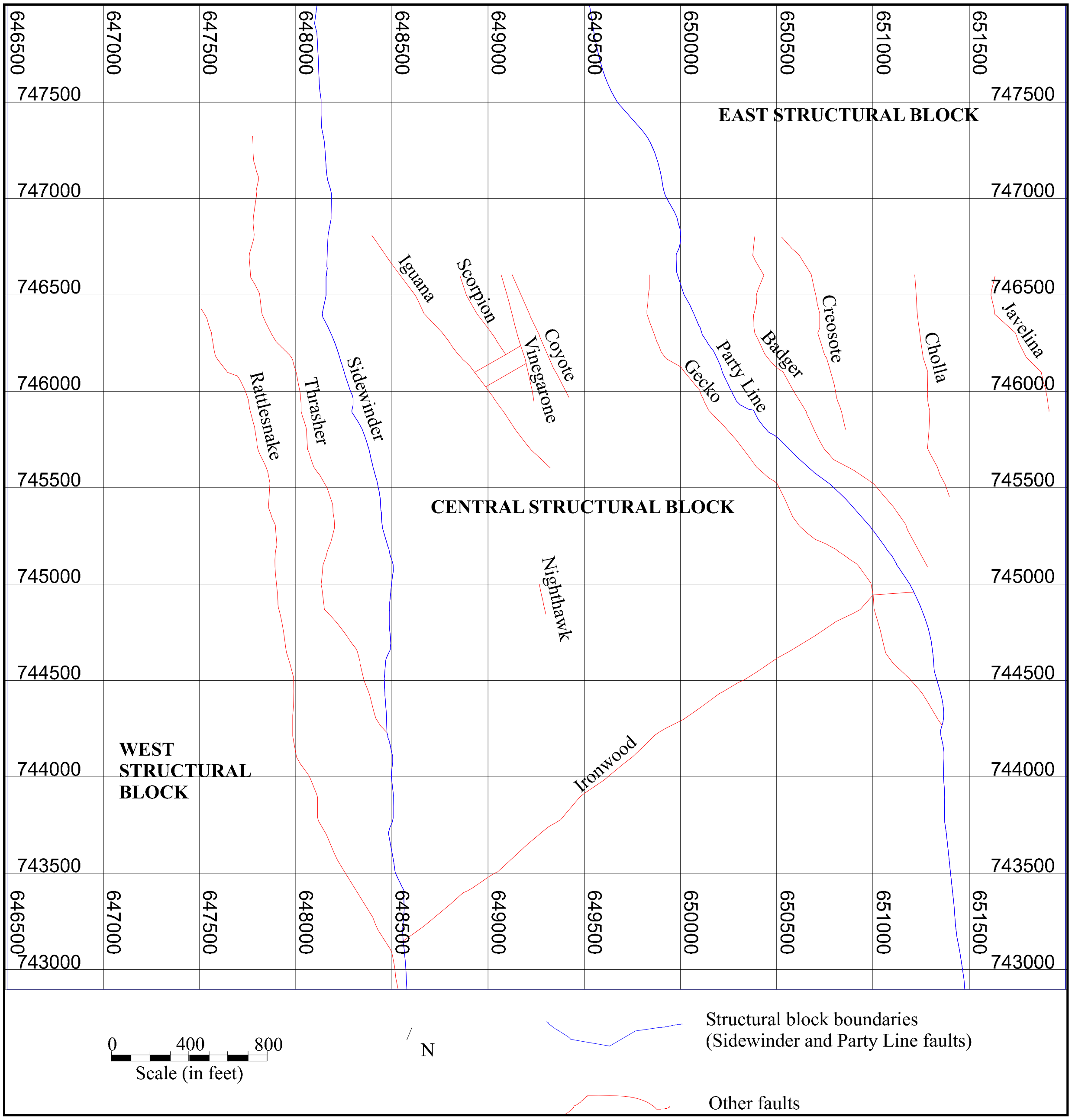


Figure 7-7: Subsurface Faults in the Florence Deposit Area Shown at 700 feet Elevation AMSL (BHP, 1997)

7.2.2 Hydrogeology

An extensive summary of the hydrogeology of the regional and local surface water and groundwater systems is found in Brown and Caldwell *Site Characterization Report* (1996a). The major surface water feature in the area is the Gila River, located about 1/2 mile south of the project. Because of upstream diversions (Florence-Casa Grande Canal and North Side Canal), the Gila River is generally dry with the exception of flow caused by brief, intense seasonal rainfall. Two watershed drainages (East Drainage and West Drainage) transect the property and administration areas. These two arroyos discharge only ephemeral flow to the Gila River. Consequently, infiltration of river water into the upper basin-fill sediments is limited to periods of ephemeral flow.

The regional groundwater gradient is from the recharge zone along the Gila River flowing north-northwest to the Salt River Basin. Historically, regional groundwater withdrawals have been primarily related to agricultural uses and utilize the basin-fill formations. Land subsidence of 7 to 12 feet and associated land fissuring has been measured in the nearby farming communities (e.g. Casa Grande, Eloy, Stanfield, and Maricopa) and is related to groundwater withdrawal. Investigations performed in the Florence area from the 1970s to 1990s indicated negligible subsidence in the Florence area; no documented land fissures have been identified in the Florence area or project site.

The saturated formations in the project area are considered to be continuous and include bedrock and sedimentary formations. Locally, the saturated formations have been divided into water bearing units that correlate with the lithologic units identified in the project area. Hydraulic properties, pump tests, and water quality data confirm that there is delayed vertical communication between the water bearing units. The approximately 350 feet of unconsolidated conglomerate and alluvial material overlying the deposit was divided into five units (BHP, 1997) that are shown in Figure 7-3 and Figure 7-4: (1) Quaternary Alluvium (Qal), (2) Upper Loose Conglomerate (ULcgl), (3) Upper Cemented Conglomerate (UCcgl), (4) Clay, and (5) Lower Cemented Conglomerate (LCcgl). Flat-lying basalt flows and dikes were encountered by drilling in the poorly indurated conglomeratic unit.

The ULcgl is the principal source of groundwater in the area, primarily for irrigation purposes; this unit is called the Upper Basin-Fill Unit (UBFU). The Clay layer is approximately 20 to 40 feet thick and is 50 to 70 feet above the top of bedrock over most of the deposit area; this unit is called the Middle Fine-Grained Unit (MFGU). The LCcgl varies in thickness from 50 to 800 feet and consists of weakly to moderately cemented conglomerate; this unit is called the Lower Basin-Fill Unit (LBFU). Table 7-1 correlates the hydrogeologic units associated with the lithologic units found in the project area.

Table 7-1: Correlation of Geologic and Hydrogeological Units in the Basin Fill Formations

Geologic Unit	Lithology	Hydrogeol. Unit	Description	Comments
Qal	Quaternary alluvium	Qal	Alluvium	Recent, coarse-grained, highly permeable, unconsolidated sediments
ULcgl	Upper Loose Conglomerate	UBFU	Upper Basin-Fill Unit	Laterally uniform, coarse-grained, permeable, unconsolidated, sediment, and matrix-supported conglomerate.
UCcgl	Upper Cemented Conglomerate	UBFU		
Clay	Clay	MFGU	Middle Fine-Grained Unit	Laterally extensive, fine-grained, calcareous silt/clay unit with low permeability
LCcgl	Lower Cemented Conglomerate	LBFU	Lower Basin-Fill Unit	Laterally extensive, coarse- to fine-grained, unconsolidated conglomerate with increasing induration and decreasing permeability with depth.
Source: Compiled by SRK, 2010				

7.3 GEOCHEMISTRY AND MINERALOGY

A number of materials characterization tests have been performed on rock materials including acid base accounting, total metals, attenuation tests, and metallurgical column and box tests with simulated raffinate, some of which are briefly summarized in Section 13. Geochemical laboratory work and model simulations were performed to assess environmental impacts during operations and post-closure as part of the demonstrations required for the 1996 APP application and for other studies and investigations (Brown and Caldwell, 1996b). BHP performed a number of mineralogy studies and metallurgical column tests to assess copper dissolution, acid consumption, and the chemistry of the raffinate over time (BHP, 1997d). The studies performed by Curis Arizona for the feasibility study are described in Section 13.

A number of mineralogy studies were completed by all previous owners and will be only briefly cited here. Work includes specific gravity studies (Carneiro, 1998; and others), X-ray diffraction studies of secondary minerals and column test residues (Brewer and LeAnderson, 1996; Eastoe, 1996; and others), and cation-exchange studies on clay minerals (Patel, 1996; Williamson, 1996; and others). Two master theses were completed to investigate controls on fracture mineralogy in the deposit (Davis, 1997) and the dissolution of oxide materials and mass balance related to in-situ reactions (Brewer, 1998). Curis Arizona drilled one hole in the former BHP field test area to characterize the nature and abundance of mineralization pre- and post-test.

7.4 GEOPHYSICS

A number of exploration companies worked regionally in the “Ray Lineament” area in the 1960s to 1980s including Conoco, Getty, Cities Service, Noranda Exploration, and others. Early work by Conoco and others consisted of the standard geophysical methods of the time period for covered area porphyry copper targets, which would have included regional airborne and ground magnetic surveys, and extensive use of dipole-dipole induced polarization electrical methods. The data generated are typically of regional reconnaissance usage and in the case of the Florence deposit, the work was largely done after the discovery was made by initial drilling. The majority of this information is not currently available in the Curis Arizona files.

Between 1993 and 1995, Noranda (Gingerich and Schaefer, ca 1996) undertook a series of covered terrain porphyry copper exploration mapping programs to evaluate the use of airborne time domain electromagnetic applications for geologic mapping. Poston Butte, in 1993, was one of the first covered porphyry copper deposits to be tested. The test survey over the Poston Butte deposit mapped a circular pattern that was coincident with the deposit location. The known major structures and areas of deep cover also were clearly visible in the data set.

In 1995, Magma ran borehole geophysical logs in 13 diamond drill holes to correlate downhole geophysics with geological core data. The tools evaluated were caliper, gamma ray, spectral gamma ray, neutron, neutron-gamma induced, sonic/variable density log, resistivity, spontaneous potential, temperature, density, radioactive tracer log, fluid density log, spinner surveys, induction, and heat pulse. Based on correlation of the geophysical signal with geologic core data, the gamma neutron tool was considered the most valuable. The geophysical signals facilitated the identification of the clay layer in the overburden, the top of bedrock, major structures, and certain rock types.

In 1997, the University of Arizona was retained to perform a three-dimensional electrical resistance tomography (ERT) study in the pilot field test area using five boreholes. ERT is sensitive to changes in electrical conductivity of the subsurface both temporarily and spatially (Stubben and LaBrecque, 1997). ERT is a borehole direct current electrical method that employs a dipole-dipole configuration. This method was tested to assess whether it would be sensitive enough to monitor changes in the conductivity of groundwater and ultimately be able to monitor the flow and recovery of injected sulfuric acid. The test successfully detected changes in electrical conductivity based on the injection of groundwater that had a different conductivity than the background groundwater, and was deemed to be a useful tool to map the temporal and spatial location of injected solutions. No additional geophysical surveys have been completed since this time.

7.5 MINERALIZATION

This section describes the mineralized zones, the controls on mineralization, and the type and location of mineralization.

7.5.1 Mineralized Zones

The mineralized zones consist of an iron-enriched leached cap, an oxide zone, and an underlying sulfide zone. In most instances, the transition from the copper silicates and oxides to the sulfide zone is quite abrupt. A majority of the copper oxide mineralization is located along fracture surfaces, but chrysocolla and copper-bearing clay minerals also replace feldspar minerals in the granodiorite porphyry and quartz monzonite. A barren or very low-grade zone, dominated by iron oxide and clay minerals, caps some portions of the top of bedrock especially in the western area. The mineralization on the eastern periphery of the deposit is typical of most Arizona porphyry copper deposits. The thickness of the oxide zone ranges from 40 feet to 1,035 feet in the western portion, and has an average thickness of 400 feet. The lateral extent of mineralization in plan is approximately 3,500 feet across in an east-west direction and from 1,500 feet to over 3,000 feet across in a north-south direction.

7.5.2 Rock Types and Relevant Geologic Controls

The dominant lithologic host unit is a Precambrian quartz monzonite (quartz monzonite porphyry – Yqm, Yqmp), which is correlative with the Oracle Granite and Ruin Granite known elsewhere in Pinal and Gila Counties. This unit is known to have intruded the Precambrian Pinal Schist as evidenced from drill core data and regional outcrops. The monzonite is felsic and phaneritic, but is coarsely porphyritic locally. The monzonite was in turn intruded by a series of Precambrian diabase dikes (Ydb). These dikes range in thickness from a few centimeters to several meters and are tabular in shape. In general, they have a dark gray to olive black aphanitic matrix with localized small (1 to 2 millimeter [mm]) plagioclase feldspar laths.

A series of Laramide intrusive bodies cross cut the Precambrian quartz monzonite and diabase dikes. The Laramide orogeny is dominantly represented in the Florence deposit by three phases or variants of granodiorite porphyry (Tgdp, Tgdp2, Tgdp3) (62 ± 1 m.y.) and, to a lesser extent, by younger (55-60 m.y.) Tertiary andesite and quartz latite dikes (Ta) (data from Conoco as reported in Nason and others, 1983). The most prevalent granodiorite porphyry variety (Type I) is a light gray, medium- to fine-grained rock containing small (2-3 mm) phenocrysts of plagioclase feldspar, biotite lenses, and less common quartz in a quartz and orthoclase matrix. Type II is more mafic and finer-grained but is coeval with Type I. The Type III variety crosscuts the other two varieties and forms barren, greenish gray dikes containing only quartz and small plagioclase phenocrysts. The Type I and Type II granodiorite units occur as a series of long thin (50 to 300 feet wide) dikes that coalesce at a depth of zero to 500 feet amsl, forming an elongated lens-shaped body. The Type III granodiorite is less common and occurs as thin tabular planes. In general, the granodiorite porphyry is less fractured and mineralized than the quartz monzonite porphyry host.

Andesite, generally various shades of medium grey, is present as thin tabular dikes that intrude along or within the granodiorite porphyry. Dikes of dacite to dacite porphyry (Td, Tdp) are present in minor amounts and generally contain a medium grey, moderate to weakly magnetic aphanitic matrix with small plagioclase phenocrysts and (locally) with quartz. Minor dikes of latite, generally brown to medium grey, have a fine crystalline groundmass, contain minor amounts of finely disseminated biotite, and often are weakly magnetic. Thin calcite and zeolites veinlets and small filled vugs are common in these units.

Overlying the bedrock surface are basin-fill units approximately 350 feet deep consisting of moderately consolidated fanglomerate with a coarse, *calcareous* arkose matrix and completely unconsolidated sand, silt, clay, and gravel lenses. The geologic model prepared by BHP (1997) divided the overburden into five units: (1) Qal, (2) ULcgl, (3) UCcgl, (4) Clay, and (5) LCcgl. Flat-lying basalt flows and dikes (Tb) were encountered by drilling in the poorly indurated conglomeratic unit.

Because the Florence deposit is almost entirely covered by deep basin-fill, Conoco originally based its interpretation of geologic structures on regional geology and exploration geophysics, development drill holes, and underground mine maps. In 1995, Magma developed a technique to refine structural interpretations of buried deposits by employing an acoustic borehole televiewer (BHTV) logging tool in selected NX, HX, and 6-inch diameter holes on the west side of the deposit. In 1996, the technique was utilized by BHP on the five holes located in the field test area. This downhole geophysical tool provides dip angles and dip azimuths for digitized fractures visible on a digital display.

The dominant structural trend at Florence is east-northeast. Within the deposit area, the pre-Laramide and Laramide northeast-trending fracture patterns are recorded on Conoco's underground maps and in oriented drill core completed by Magma and BHP. The Tertiary granodiorite porphyry intrudes along the east-northeast to northeast zones of structural weakness. Conoco reported that most sulfide copper-bearing fractures underground also trend northeast. Another dominant set of fractures trends north to north-northwest and dips westerly; these fractures have been attributed to the Basin and Range extensional tectonics. The most apparent structural trends in the Florence area are the major horst-and-graben structures related to mid-Tertiary normal faulting. The Florence deposit lies within a horst block bounded on both the east and west sides by deeply buried, fault-controlled depressions or grabens. The relatively narrow depressions trend north-south to north-northwest and are filled with as much as 1,300 feet of fanglomerate and unconsolidated alluvial material. Copper grades exceeding 0.4% TCu were encountered in quartz monzonite in deep drill holes beneath these paleo-depressions.

The major post-mineralization structures intersected in drill core are the Party Line and Sidewinder faults (see Figure 7-7). The Party Line fault is a fault zone 50 to 100 feet wide striking N. 34º W., and dipping -45º to -50º W. with a maximum offset of 1,000 feet. The Party Line fault bounds the eastern portion of the deposit and has a strike length in excess of 3,600 feet. The footwall east of this fault was not previously deemed to be economic owing to thin oxide zone, but this will be reviewed by Curis Arizona. Bounding the western edge of the mineable deposit is the Sidewinder fault, which can also be traced for thousands of feet. The offset along this wide fault zone is approximately 250 feet; the hanging wall has been intensely fractured. The Sidewinder fault is responsible for creating a north-northwest trending paleo-valley within the deposit; this depression is as much as 200 feet deep and has been traced over a strike length of 2,500 feet. Several other north-northwest trending faults have been postulated between the Party Line and Sidewinder faults and west of the Sidewinder fault.

The BHTV was used in conjunction with detailed fracture angle and fracture mineralogy notes recorded and compiled by geotechnicians. The goal was to study the vertical distribution of common mineralized material and gangue minerals, to determine predominant structural trends, and to identify preferred fracture orientations for copper-bearing structures. These data are incorporated into the geology and hydrology models and production well field design. Structural data from more than 27,000 fractures in 17 oriented core holes indicates a preferred strike range of north to N. 30° E. dipping 60 to 70 degrees west or northwest. Copper-bearing fractures are somewhat randomly distributed, but copper oxides most commonly occur on fractures striking north to N. 30° E. and dipping 50-60 degrees west or northwest. The BHTV data indicated the possible presence of eastwardly and southwardly dipping structures, which have not yet been incorporated in the geologic model and will be re-examined in future model iterations.

Conoco drilling intersected tilted Whitetail Conglomerate (basal consolidated fanglomerate) with dips of 40 to 60 degrees in some downthrown blocks; north of the deposit, however, the same conglomerate units show little or no tilting. Along the Party Line fault, the oxide-sulfide boundary shows significant offset; however, over the majority of the deposit the oxide-sulfide interface is quasi-horizontal or gently undulating and mirrors the eroded, post-fault paleotopography of the top of bedrock. Rotation, if it occurred, took place pre-oxidation or within specific fault blocks before the latest age of faulting (Nason et al., 1983). The steeply dipping Tertiary granodiorite porphyry and Precambrian diabase would suggest that any tilting of the deposit was probably minor (less than 30 degrees). Additional structure analyses combined with alteration studies may provide more conclusive data regarding the possible rotation or tilting of the Florence copper deposit.

7.5.3 Length, Width, Depth and Continuity

The thickness of the oxidized zone ranges from 40 to 1,000 feet, and has an average thickness of 400 feet. The top of the oxide zone begins below 350-375 feet of alluvial and basin-fill material. The length and width of the oxidized zone is irregular. The proposed ISCR well field area covers 213 acres.

A three-dimensional geologic model constructed by BHP between September 1996 and May 1997 used information from 795 drill holes, including 487 drill holes within the block model area. The geologic model consisted of a rectified set of digital 52 east-west and 56 north-south sections at 100-foot spacing and 50 plan maps at 50-foot elevations (see Table 7-2); the digital files are in possession of Curis Arizona and have been updated by SRK for select areas of recent drilling. The block model reflects the general dimensions of the deposit, which are given in Table 7-3. Coordinates are expressed in Arizona State Plane Coordinates (northing and easting) and elevation (feet above mean sea level [amsl].

Table 7-2: Cross Sections and Plan Maps within the Geologic Model Area

Plane Type	# of Planes	Plane Range (feet)	Spacing (feet)	Scale (feet)
E-W Cross Section	52	742900 N to 748000 N	approx. 100’	1”=100’
N-S Cross Section	56	646500 E to 652000 E	100’	or
Plan	50	-1000’ to +1400’	50’	1:1,200
Note: Compiled from BHP, 1997a. Coordinate system is in the Arizona State Plane system (NAD 27) in feet.				

Table 7-3: Spatial Limits of the Geologic Block Model

	Minimum (feet)	Maximum (feet)
Northing	742500	748000
Easting	646500	652000
Elevation feet amsl	-1,500	+2,000
Note: Compiled from BHP, 1997a. Based on Arizona State Plane Coordinates, NAD27, feet.		

7.5.4 Type, Character and Distribution of Mineralization

The main type of mineralization is oxide with underlying sulfide separated by a transition oxidation zone. The underlying sulfide zone, because of its depth, low permeability, and relatively non-soluble mineralogy, is not economic to develop by ISCR methods.

Mineralization in the oxide zone consists of chrysocolla, "copper wad," tenorite, cuprite, native copper, and trace azurite, and brochantite. The majority of the copper occurs as chrysocolla in veins and fracture fillings, while the remainder occurs as copper-bearing clays in fracture fillings and former plagioclase sites. Davis' study (1997) on the fracture-controlled mineralogy within the Florence deposit indicates that copper is not adsorbed onto the clay surfaces, but rather the copper resides in the octahedral site of the clays. The "copper wad" appears to be an amorphous mix of manganese, iron, and copper oxides that occurs as dendrites, spots, and irregular coatings on fracture surfaces. Cuprite occurs locally smeared out along goethite/hematite-coated fracture surfaces; the chalcotrichite variety of cuprite is also present on fractures or vugs, sometimes intergrown with native copper crystals.

The main hypogene sulfide minerals are chalcopyrite, pyrite, and molybdenite with minor chalcocite and covellite. Supergene chalcocite coats pyrite and chalcocite and dusts fracture surfaces. The supergene chalcocite blanket is very thin and irregular (zero to 50 feet). In most instances, the transition from the copper silicates and oxides to the sulfide zone is quite abrupt.

In general, the grade of oxide mineralization is very similar to that of the primary sulfide mineralization. The overall grade of the oxide and sulfide mineralization is approximately 0.356% TCu and 0.268% TCu, respectively.

7.5.5 Alteration

Hydrothermal alteration accompanied the intrusion and cooling of the Tertiary granodiorite porphyry stocks and dikes into the Precambrian quartz monzonite. Alteration in the granodiorite porphyry is primarily veinlet-controlled, whereas alteration in the quartz monzonite encompasses all three styles; pervasive, selectively pervasive, and veinlet-controlled. Potassic alteration (quartz-orthoclase-biotite-sericite) is the dominant alteration assemblage. Salmon-colored, secondary orthoclase replaces primary orthoclase phenocrysts, rims quartz ± biotite veins, and occurs as pervasive orthoclase flooding. Shreddy, secondary brown biotite replaces plagioclase and matrix feldspars, and occurs in biotite-sulfide veinlets.

A sericitic (quartz-sericite-pyrite) alteration zone surrounds the potassic zone and is especially evident in the deep portions of the sulfide mineralization. Fine-grained sericite selectively replaces plagioclase, orthoclase, and biotite, and forms thin alteration selvages along quartz ±sulfide veins. Propylitic (calcite-chlorite-epidote) alteration is visible in mafic dike rocks and is reported in exploration holes fringing the deposit.

The most noticeable feature in the oxide mineralized material zone is a late-stage argillic alteration assemblage consisting of montmorillonite - kaolinite ± illite ± halloysite. The conversion of sericite to clay minerals in plagioclase phenocrysts and along fracture surfaces is selectively pervasive. X-ray diffraction analyses indicated the clay is primarily a mixture of calcium-montmorillonite and kaolinite. These clay-altered plagioclase sites were favorable loci for remobilized copper generated from natural in-situ leaching (BHP, 1997, v. 2, p.18).

8 DEPOSIT TYPES

The mineral deposit type found at the FCP site is an extensive, Laramide type of porphyry copper deposit consisting of a large core of copper sulfide mineralization lying beneath a zone of copper oxide mineralization. The central portion of the deposit is overlain by approximately 350 to 375 feet of flat-lying conglomerate and alluvial material that contains a fine-grained silt and clay interbed (see Figure 7-3). The oxide and sulfide zones are separated from one another by a transition zone ranging on average from 0 to 55 feet in thickness. Both oxide and sulfide copper mineralization are present, but the depth of the sulfide zone renders it currently uneconomic to mine by conventional open-pit mining methods. The impermeability of the sulfide zone renders copper extraction non-economic by ISCR methods.

Approximately 71% of the oxide mineralization is hosted by a Precambrian quartz monzonite host and 26% by Tertiary granodiorite porphyry. The remaining igneous rocks associated with the deposit are Precambrian diabase and Tertiary andesite, latite, dacite, basalt, and aplite. The deposit occurs in a structural horst block, which is bounded on the east and west by grabens and is controlled by normal faults trending north to northwest.

The deposit type is a typical southwestern U.S. porphyry copper deposit, as described by many authors (Titley and Hicks, 1966; and Lowell and Guilbert, 1970). The United States Geological Survey (USGS) classification (Cox and Singer, 1992) of the potential porphyry copper mineralization at the Florence deposit is model 21a (porphyry Cu-Mo) (Cox, 1992). This model type is described as stockwork veinlets of quartz, chalcopyrite, and molybdenite in or near a porphyritic intrusion, with rock types of porphyritic tonalite to monzogranite stocks and breccia pipes intrusive into batholithic, volcanic or sedimentary rocks. The typical mineralogy consists of chalcopyrite, pyrite, and molybdenite, with peripheral vein or replacement deposits with chalcopyrite, sphalerite, galena, and gold, with outermost zone of veins of Cu-Ag-Sb-sulfides, barite, and gold. Typical alteration consists of quartz, K-feldspar, biotite, chlorite, and anhydrite (potassic alteration) grading outward to propylitic alteration. Late white mica and clay (phyllic) alteration may form capping or outer zones or may affect the entire deposit.

The Canadian mineral deposit type is porphyry Cu-Mo or model 19.2 Cu-Mo (±Au, Ag). Examples of this deposit type are Esperanza, Sierrita, and Mineral Park, Arizona (Kirkham and Sinclair, 1995). Porphyry copper and porphyry Cu-Mo deposits have the principal minerals of chalcopyrite, bornite, chalcocite, tennantite, enargite, other copper sulfides and sulfosalts, molybdenite, and electrum. These deposits normally have Ag, Pb, Zn, and Au halos surrounding the Cu-Mo central portions of the deposits.

9 EXPLORATION

The previous owners performed substantial exploration work including drilling (exploration, assessment, condemnation, geotechnical, and environmental), underground mine development, geophysical surveys, and mineralogy studies. Curis Arizona conducted a rotary-core drilling program in 2011 to confirm resources and to acquire metallurgical test samples. SRK has reviewed the data generated by the current and previous operators for exploration, site characterization, resource estimation, and environmental permitting.

A summary of the historical exploration activities and drilling campaigns is provided in Sections 6 and 10, respectively. Conoco, Magma, and BHP conducted multiple geological, geochemical, hydrogeological, and geophysical investigations and surveys to characterize the deposit. The historic data are available for inspection including drill logs, sample rejects/pulps, assay sheets, cross sections, core photographs, downhole survey discs and plotted deviation maps, underground geology map, aerial photographs, hydrological pump test data, metallurgical reports, project correspondence, and other data. Geologic logs record the type of drilling (diamond drill, reverse circulation [RC], rotary), collar surveys and/or approximate drill collar coordinates, rock types, mineralization, alteration, and structure. Data related to the 2011 Curis Arizona drilling program is archived in hard copy and digital format. More recent historical work relevant to a potential ISCR operation is summarized below.

9.1 SURVEYS AND INVESTIGATIONS

Detailed mineralogy and petrography reports are available on numerous drill core samples. Structural logs recording the fracturing, faulting, and jointing information have also been prepared. Two Masters theses were written on fracture-controlled mineralogy (Davis, 1997) and leaching experiments and mass balance modeling simulating in-situ leaching within the oxide zone (Brewer, 1998) of the Florence property. Three techniques were used to study aspects of fracture mineralogy: X-ray diffraction (XRD), scanning electron microscope (SEM), and fracture mineralogy logging of 15 core holes. The results of the XRD and SEM studies indicated that most of the copper-bearing clays are smectite, most probably Ca- or Mg-montmorillonite.

Fracture mineralogy studies were undertaken because, for solution mining, it is critical to identify the mineralized material and gangue minerals on the fractures in order to model and predict the chemical reactions that will occur as the injection solutions travel through the rock. Results of the fracture mineralogy logging identified limonite, goethite, and/or hematite in 12,234 of 13,378 fractures identified in the study and chrysocolla and/or tenorite in 4,041 fractures. Approximately 75,438 drill-core intervals and RC-chip samples have been assayed for total copper (TCu) through 2011. Of that number, 29,482 assays are in the oxide zone.

Specialized investigations undertaken at the FCP site consist of regional geophysical surveys; borehole geophysical and geotechnical logging to aid in mapping the subsurface geology; fracture mineralogy studies; and downhole mapping with an acoustic borehole televiewer (BHTV). Regional geophysical survey results are described in reports prepared by Conoco but have not been inspected by SRK. Borehole geophysics (sonic, gamma-neutron, electrical conductivity) are available on all BHP drill holes and a selection of Magma drill holes. Acoustic

BHTV logs are available on selected BHP drill holes. An acoustic BHTV survey was performed in holes located primarily on the west side of the deposit and within the area proposed as the first production area. The intent was to identify actual orientations of subsurface fractures and faults by surveying the undisturbed borehole wall.

Geophysical log data collected in diamond drill holes were correlated to geological data in the same holes. The information and conclusions were then applied to gaining reliable geological information from the injection and recovery wells that were rotary drilled. The gamma and neutron logs were considered to provide the most valuable downhole information at the FCP site.

Geotechnical logging was used to gain a better understanding of fracturing intensity and depths. The geotechnical works included marking detailed core footages; measuring core recovery and core losses and calculating Rock Quality Designations based on that information; and characterizing rock fracturing and mechanical integrity.

9.2 INTERPRETATION

SRK has relied on personal inspection of the core, reports, and site records and interpretations made by previous operators and various consulting companies related to:

- Regional and local geology, hydrogeology, and structure;
- Deposit-scale geology, hydrogeology, structure, and mineralogy;
- Distribution of mineralization;
- Water level and water quality conditions; and
- Numerical groundwater flow modeling and hydrochemical modeling prepared to support environmental permit applications.

Based on a review of the information provided to SRK by Curis Arizona and information available in the public domain, SRK is of the opinion that the specific historic mineral exploration on the property was conducted in a professional manner. Interpretations derived from these studies appear reasonable and accurate. The site characterization test work and modeling (geological, groundwater, metallurgical, geochemical) were performed to industry standard methods and are acceptable for resource estimation and production planning purposes, and for submission in support of environmental permit applications to the regulatory agencies.

10 DRILLING

Curis Arizona completed a metallurgical drilling program in two areas of the deposit from May to August 2011 that confirmed previous historic drilling results for these areas. The drilling program provided representative samples for the metallurgical test work that is described in Section 13 of this report. The historical drilling results and data entry have been verified by more than one company and are fundamental to the project. The basic drilling information that supports the resource estimation in Section 14 and the metallurgical test work in Section 13 Mineral Processing and Metallurgical Testing of this report is presented in this section.

Drilling on the FCP site has been undertaken by means of core drilling, RC rotary drilling, and conventional rotary drilling. Conoco developed a detailed geologic core logging protocol in the early to mid-1970s. With slight modifications, Magma, BHP, and Curis Arizona geologists have continued to use this method to maintain compatibility with the geologic data produced by Conoco.

10.1 TYPE AND EXTENT OF DRILLING

Drilling has been completed at the property and in the vicinity by the four previous owners as tabulated in Table 10-1. Downhole drilling surveys were completed by all owners at approximately 100-foot increments. Data entry was completed by both in-house staff and outside companies (data entry firms and consulting companies). Each subsequent owner has cross-checked and corrected the data entry of the preceding company as needed. A perspective view of the drill collars and downhole drill traces as of 2011 in the immediate vicinity of the project land boundary is shown in Figure 10-1.

Table 10-1: Drilling Footage by Company as of August 2011

Company	# of Holes	Footage
Curis Resources (2011)	6	7,752.0
BHP Copper (1997)	21	16,637.5
Magma Copper Company (1994-1996)	173	146,891.0
Conoco (1970-1977)	612	620,483.2
Other	5	3,716.0
Total	**817**	**795,479.7**

Source: Compiled by SRK, 2011. SRK has documented the location of 612 Conoco holes in the project database, but 686 were drilled by Conoco through 1977 within a 6-mile radius. An additional 74 shallow assessment holes drilled in distant sections are not included in the project database.

Note: Perspective view looking due north at -85 degrees. Drill collars and downhole drill traces from 2011 database. TCu cutoff colors are shown; yellow=0.3 %TCu, orange=0.5 %TCu, red=>0.6 %TCu. Curis land (green); Arizona state mineral trust land (blue).

Figure 10-1: Deposit Area with Property and Mineral Lease Boundaries, Topography and Drill Hole Traces as of August 2011

Between March 1970 and late 1975, Conoco reported that it drilled 659 holes within the main deposit and peripheral areas (Conoco, 1976). The holes through 1975 were drilled by a combination of rotary (659 holes) and diamond drill (396) methods. Through 1977, Conoco drilled a total of 686 holes covering more than 30 sections within a 6-mile radius including shallow exploration and assessment holes at Cholla Mountain and other distant exploration targets.

Rotary drilling was primarily used to pre-collar the hole through the basin-fill formations in advance of core drilling. It was also used for assessment and condemnation drilling on the state and federal land controlled by Conoco at the time. Nearly all Conoco diamond drill core was NX-diameter (5.4 centimeters [cm], 2.2 inches [in]), although poor ground conditions necessitated a reduction to BX-diameter (4.2 cm, 1.6 in) core upon occasion. In addition, four holes were NC-cored through the overburden. The Conoco exploration drilling program was initiated on a triangular grid pattern beginning with 1,000-foot spacing and subsequently reduced to 500-foot spacing. Development drilling was performed on in-fill drill hole density of 250 feet. SRK has compiled the records for 612 Conoco drill holes within 6 miles area of the project; the remaining 74 drill holes were for work not relevant to the Florence deposit area in distant sections.

Magma drilled 42 additional holes for their Pre-Feasibility Study (Magma, 1994) including 23 NX-diameter core holes for the confirmation drilling, five HX-diameter (6.4 cm, 3 in) core holes for exploration in nearby Section 22, two 6-inch core holes for obtaining bulk metallurgical samples, and 12 rotary-drilled pump and observation wells for pumping tests. In general, the core holes were rotary drilled through the overburden to about 50 to 100 feet above the top of bedrock, and then cored into bedrock. On the western side of the deposit, coring sometimes started several hundred feet above the top of bedrock providing good evidence of the nature of the conglomerate-bedrock contact.

During Magma's tenure, drilling for groundwater and geotechnical characterization was completed by Magma's consultants to support environmental permitting and engineering activities. BC supervised the drilling and installation of 31 point-of-compliance (POC) groundwater monitoring wells by conventional mud rotary methods. Thirty-six aquifer test wells (pump and observation wells) were drilled by conventional mud rotary or reverse circulation methods. Geology was recorded for sample intervals from these 68 boreholes, but the samples were not analyzed. Dames and Moore drilled 7 holes for geotechnical characterization.

Magma began a resource definition drilling program in 1995 that continued through 1997; the program was completed as BHP's Pre-Feasibility program after BHP purchased the property in January 1996. Of the 44 core holes drilled during this period, two holes were 6-inch core, eight holes were HX-diameter core, one hole was a combination of 6-inch and HX core, and the remaining 33 holes were NX-diameter core. In general, these core holes were rotary drilled to about 50 to 100 feet above bedrock, cased to the bottom of the rotary portion, and cored using a split tube in order to maintain core integrity for rock quality designation (RQD) measurements.

Twenty one additional holes were also added by BHP in 1996-1997 for the pilot field test including injection, recovery, chemical monitoring, and groundwater monitoring wells. The drilling included two combination rotary/HX core holes, one rotary 6-inch/HX core hole, one rotary/NX core hole, fourteen rotary/RC holes, and three rotary-only holes. Rotary drilling was completed through the top 40 feet of bedrock in the combination core or RC holes. The core and RC portions of holes were assayed for %TCu and %ASCu, but an updated resource estimation was not prepared by BHP. A summary of the number of drill holes, footage lengths, sample intervals, and intervals with TCu assays in the BHP database and within the model limits at the conclusion of drilling in 1998 is presented in Table 10-3.

Table 10-2: Drilling and Assays in the BHP Database as of May 31, 1997

	Total Database	Within Model Limits	Within Permit Area
Drill Holes	795	487	274
Sample Intervals	86,236	70,300	43,034
Intervals with TCu assay	74,495	60,880	37,975
Intervals with TCu assays in the oxide zone	28,310	22,544	14,586
Intervals with ASCu assays	31,482	29,385	20,755
Intervals with ASCu assays in the oxide zone	19,239	18,540	13,760
Re-assayed Conoco intervals	432	432	432

Source: BHP (1997, v. 2, p. 29). This data set was used by BHP to prepare the 1997 resource estimate.

Table 10-3: Drilling and Assays in the BHP Database as of 1998

	Total Database	Within Model Limits
Total Drill Holes	811	502
Drill holes with TCu assays	610	380
Total Drilling Footage	788,802.7	577,317.4
Total Assayed Footage	410,520.4	328,850.6
No. of Sample Intervals	87,274	71,402
No. of Intervals with TCu assays	75,079	61,531
No. of Basin-fill Intervals	10,523	10,074
No. of Basin-fill Intervals with TCu assays	3,010	2,886
No. of Oxide/Transition Zone Intervals	32,134	25,175
No. of Oxide/Transition Zone intervals with TCu assays	29,139	22,765
No. of Sulfide Zone Intervals	40,911	36,153
No. of Sulfide Zone intervals with TCu assays	40,364	35,880

Source: Compiled by SRK, 2010. This data set was used to prepare the 2010 SRK resource estimation. Holes lacking TCu assays consist primarily of monitor, aquifer test, POC, and water supply wells, geotechnical drill holes.

In May through August 2011, Curis Arizona drilled six diamond drill holes to obtain metallurgical and assay samples in two representative areas of the deposit ,south of the BHP field test area and in the northwest portion of the deposit. The drill holes included five PQ-diameter (8.5 cm, 3.35 in inner diameter) core holes and six HQ-diameter (6.3 cm, 2.5 in) core holes. Five of the HQ holes were drilled as wedges from the PQ hole at 1-1.5 degrees in dip from the inclination of the original PQ hole. The PQ holes were intended to provide good quality metallurgical samples with assays provided by the wedged HQ hole. An additional HQ hole was drilled in the former BHP field test area. A summary of the current drill hole data through August 2011 is presented in Table 10-4.

Table 10-4: Drilling and Assays in the Curis Database as of 2011

	Total Database	Within Model Limits
Total Drill Holes	822	508
Drill holes with TCu assays	611	384
Total Drilling Footage (ft)	795,479.7	584,625.4
Total Assayed Footage (ft)	412,216.5	330,580.7
No. of Sample Intervals	88,459	71,761
No. of Intervals with TCu assays	75,438	61,890
No. of Basin-fill Intervals	10,552	10,124
No. of Basin-fill Intervals with TCu assays	3,010	2,886
No. of Oxide/Transition Zone Intervals	33,150	26,246
No. of Oxide/Transition Zone intervals with TCu assays	29,482	23,108
No. of Sulfide Zone Intervals	40,944	36,186
No. of Sulfide Zone intervals with TCu assays	40,377	35,892

Source: Compiled by SRK, 2011. Holes lacking TCu assays consist primarily of monitor, aquifer test, POC, and water supply wells, metallurgical, geotechnical drill holes.

Digital database compilation was performed by all owners of the property. Magma compiled the drill hole information from 795 exploration, development, condemnation, assessment, and water holes into a consistent database. In addition, approximately 37% of the data compiled by Conoco in the mid-1970s were entered into the project database by Southwest Data Services, of Tucson, Arizona. These data were restricted to 267 drill holes within the mineralized area. The data entry for representative percentage of the resulting database was spot-checked by IMC (IMC, 1994).

IMC added the remaining 419 Conoco drill holes and Magma's prefeasibility verification drill holes to the database directly from the drill logs early in 1993. A number of the Conoco holes in distant sections were reviewed but not included in the project database for a variety of reasons, primarily because the drillholes are too distant from the property to be relevant to modeling or development work at the Florence project. The majority of the discarded holes were drilled in areas 10 to 25 miles from the centroid of Florence project sites as part of exploration prospecting work Conoco geologists did at the time Conoco was doing their feasibility studies at the Florence site. These holes also included shallow (<50 ft) claim assessment holes drilled north of Hunt Highway north and west of Poston Butte and shallow holes that were drilled into the top portion of the Upper Basin Fill at distances of 5 miles or more from the centroid of the deposit north of Hunt Highway.

Drill hole data from BHP's Pre-Feasibility drilling program were entered in-house as geologic logging was completed; an extensive review was completed by BHP staff of all prior data entry. Changes to the database to correct for data entry errors, geological logging errors, or to add estimated downhole surveys based on average measurements for adjacent holes were documented in the drill hole files. A summary of the historical BHP drill hole database as of May 31, 1997 used for resource estimation is shown in Table 10-2; 487 drill holes were within the model area and used for resource estimation. The table includes the number of TCu and ASCu assays for all the metallurgical zones, as well as for the oxide zone only (including the transition zone). Intervals from the Conoco drill holes within the first planned production block were reassayed during the feasibility study and the historical TCu and ASCu assays for these intervals were replaced.

The exploration core holes drilled by Magma and BHP (1993 through 1996), geotechnical holes drilled by Dames and Moore, and the 2011 Curis Arizona metallurgical holes were abandoned in compliance with, and according to the requirements of the Arizona Department of Water Resources (ADWR) Well Abandonment Procedure Arizona Revised Statues (A.R.S.) § R12-15-816.

SRK is of the opinion that the historical drilling is sufficiently well documented that it forms a reliable drill hole database sufficient for resource estimation. Type of drilling, extent, and drill spacing density (approximately 250 feet) are adequate to represent the geology and mineralization.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

This section describes sample preparation, analyses, and security related to drilling samples. The sample collection and analysis of water quality and other characterization samples is also discussed.

11.1 SAMPLE PREPARATION METHODS

The historical and current sample preparation methods are discussed below.

11.1.1 Historical Samples

Sampling protocols were developed by previous owners to ensure consistency and remove or eliminate bias. Conventional rotary and/or reverse circulation ("RC") drill cuttings were generally collected every 10 feet by Conoco, Magma, and BHP. A representative fraction of each sample was placed in a sieve, and observations were made on the chips before and after rinsing. A representative sample for each interval was placed in a waxed, cylindrical cardboard container (Conoco) or plastic chip tray (BHP) for future reference. Samples drilled by RC methods were sent for assays; rotary cuttings were assayed by Conoco but were used by BHP only for geological control. Total copper (TCu) analyses from conventional rotary drilling by the previous companies were considered unreliable, and the BHP rotary samples were therefore not sent for assays.

Core samples provide the most detailed information. BHP sample-handling protocols used during core handling are summarized here, but were built on similar protocols used by Conoco and Magma. The core was first wiped free of drilling mud and then photographed using 35-mm, color film to preserve a record of the intact core. The core sample was next split according to the intervals listed on the sample sheets prepared by a geologist. The following method was used to saw and sample the core:

- The core within each row of core box was divided visually into left and right halves running the length of the box.
- A dividing line was used as a guide to saw the core into halves. In the first row, the left half was put into an olefin sample bag for assaying and the right half was returned to the box. In the next row, the right half was selected for assaying and the left was returned to the box. The use of alternating left and right halves for the assay sample was intended to reduce one aspect of sampling error.
- Intensely broken material was taken from the core box row using a narrow, flat-edged scoop that was half the width of the core box row.
- Every 200 feet, both halves of the sample interval were collected for assaying. The duplicate samples were labeled "A" and "B" and were weighed prior to shipment. The difference in weight between samples "A" and "B" was typically no greater than 200 grams.

- At every 15 samples, a control sample was inserted into the set of samples shipped to Skyline Laboratories. The control samples were already prepared as pulp samples and weighed prior to shipment.

The coarse rejects were stored in 55-gallon drums adjacent to the core storage building, and the core boxes were shelved in the core storage building. The coarse rejects are no longer in usable condition.

11.1.2 Curis Samples

Sample preparation protocols for the 2011 metallurgical and confirmation drilling program were outlined in the *Curis 2011 Drill Program Operation Manual* (Titley, Yang, and Hoag, 2011). The procedures were similar to those used by previous operators but differed in that the core was treated differently depending on the core diameter and purpose. PQ core was collected for metallurgical tests and was not assayed; the companion HQ core was collected for analyses. The core was logged, photographed, and sampled by SRK geologists and technicians under the supervision of SRK Principal Geologist C. Hoag and Curis Arizona site personnel.

PQ-diameter core was taken in the 5-foot split tube core barrels from the drill rig to a nearby logging table where it was wiped free of drill mud and photographed by the SRK technician. Owing to thick mud coating, it was later necessary to wrap the core in a flexible, fine-mesh non-metallic screen to allow more rigorous cleaning to free the entire core cylinder of mud residue. The handling procedures were designed to minimize mechanical breakage of the core thereby preserving samples with representative fracture densities for metallurgical testing. After geological and geotechnical logging, the PQ core was secured (still in the wrapped mesh) and placed within 4-inch drainage pipe that had been cut longitudinally. The pipe was secured with end caps, taped shut, and labeled with the footage intervals. The polyethylene sample tubes were then stored in a secure, locked warehouse prior to shipping to metallurgical test facilities in Tucson, Arizona.

HQ core was boxed at the drill rig and taken to a secure, locked logging facility where the core was cleaned and photographed. After geological and geotechnical logging was completed, the geologist marked out the 5-foot sample intervals with aluminum sample tags and created a sample cut sheet for the sampling technician. The interval lengths were adjusted to match rock contacts as appropriate. Sampling was performed by the SRK technician in a locked warehouse building adjacent to the logging facility. Intact pieces of core were sawn along a center dividing line as before and one half of the core material was placed in the sample bag. Intensely broken material was sampled with the same flat-edged scoop used to sample the broken Magma and BHP core. The sample bags were marked with a sequential identification number, and sample tags with the same numbers were placed into the bags. Quality Control/Quality Assurance (QA/QC) samples including pulp standards and field blanks were inserted every 20th sample into the sample stream as described in Section 11.3. Following logging and sampling, the core was moved to final storage in a locked warehouse building adjacent to the Administration Building.

11.2 SAMPLE ASSAYING PROCEDURES

This section presents the sample analysis procedures for rock, water quality, and solution samples taken at the Florence Project since the 1970s by various companies. Sections 11.2.1 and 11.2.2 present the sampling and analysis procedures by predecessor companies. Section 11.2.3 presents the analysis procedures used by Curis Arizona.

11.2.1 Conoco

Through 1973, Conoco logged the geology in the exploration drill holes (1,000-feet and 500-feet drill spacing) in 2.5-foot intervals and collected assay samples at 5-foot intervals. The later in-fill development drill holes (250-foot spacing) were logged in 5-foot intervals and assayed in 10-foot intervals (Conoco, 1976). The core from the 500-foot spaced holes was photographed and sample pulps were prepared on-site. The 5-foot and 10-foot sample pulps were sent to outside assay laboratories (primarily American Analytical and Research Laboratories of Tucson, Arizona) for TCu content in percentages listed to two decimal places and with a method detection limit of 0.01% TCu. The remaining material in the pulp sample was composited into 50-foot samples and assayed for %TCu, %ASCu, molybdenum (parts per million [ppm]), silver (ppm), and some gold (ppm) on early samples. Check assaying for %TCu was done by another outside assay laboratory. Reject samples of two size fractions were retained on the property for future reference and for metallurgical bench testing (Conoco, 1976).

When development drilling began, core samples were completely crushed for analysis on 10-foot intervals and were not retained for reference. Every tenth sample was check assayed by another assay laboratory for %TCu. Conoco analyzed the core drilled in 1975 in its on-site laboratory at the pilot plant facility.

Much of the Conoco laboratory equipment remains on site in the Admin Building (glassware, hot plates, Bunsen burners, fume hoods, beam balances, chemical cabinets/sinks etc.). During the limited time available during the site visits, SRK was unable to find physical records documenting the sample preparation and analytical protocols used by Conoco or its contract laboratories. The Qualified Person (QP) assumes these are stored on site based on the careful storage and organization of other drill hole related materials (logs, assay receipts, pulps, core, rejects etc.). Conoco pulps and rejects are stored in a dry condition (with minimal damage by rain/animals) in the core storage building on site. Dry, undamaged pulps were used by Magma during confirmation reanalysis efforts. The assays by the primary contract laboratory, American Analytical and Research Laboratories, were performed under the supervision of Mr. Pete Soto Flores who was an Arizona-registered assayer (#6852) from 1968 through 1990. Signed (sealed) and dated laboratory receipts have been continuously filed on site in the geology log files, which are now in Curis Arizona’s possession. Although a record of the assaying procedures was not found during the site visits, the QP assumes the analytical methods used for the %TCu and %ASCu assays were by well-known, standard methods.

11.2.2 Magma and BHP

Magma/BHP utilized both its in-house laboratory at the nearby Magma/BHP San Manuel Operations and outside contracted laboratories (primarily Skyline Assayer & Laboratories ("Skyline") in Tucson, Arizona) to perform analyses of core and RC samples. The San Manuel Metallurgical Laboratory and sample preparation facilities were designed to provide daily support to the mine, SX/EW plant, concentrator, smelter, electro-refinery, and rod plant operations including daily underground and open pit blasthole samples, process solution samples (raffinate, pregnant leach solution [PLS]), and quality control analysis of copper and molybdenum sulfide concentrates, and copper anodes, cathodes, and rod. The analyses were performed under the supervision of professional metallurgists and laboratory managers. The San Manuel Metallurgical Laboratory used standard, industry accepted methods for the preparation of sample rejects and pulps and the analysis of %TCu content by atomic absorption methods. The analyses are typically in percentages to two decimal places for both TCu and ASCu content.

Many variations exist on the method used to analyze acid soluble copper content at the copper operations in Arizona. The methods vary slightly from operation to operation even under the same company ownership – the key was to maintain internal consistency at each operation for relative comparison of the extent of oxidation in each material type within the same deposit. The various ASCu determination methods provide a relative indication of the percentage of copper that is released with short-duration exposure to dilute sulfuric acid under specified time, temperature, and acid-concentration conditions; the time (5 minutes to 2 hours), temperature, and concentrations vary by operation. When outside laboratories are used, the operation typically provides a copy of its method to the outside laboratory to ensure consistency of the method used.

The TCu analysis method used by Skyline is a standard industry method identical to what was used by the San Manuel Metallurgical Laboratory. The "San Manuel Method" was consistently used by Magma, BHP, and outside laboratories contracted by Magma/BHP for the analysis of %ASCu content in the Florence drill and metallurgical test samples. The Total Copper Method and "San Manuel Method" for ASCu analyses are shown below.

- Total Copper Analysis in Rock Samples – Skyline Assayer & Laboratories
  - Accurately weigh 0.4000 to 0.4300 grams of the sample into a 200 milliliter (mL) flask. Weigh samples in batches of 20 samples plus 2 checks (duplicates) and 2 standards per rack. At end of job, weigh the tenth sample out of each rack plus 4 standards.
  - Add 10.0 mL hydrogen chloride (HCl), 3.0 mL nitric acid (HNO_3) and 1.5 mL perchloric acid ($HClO_4$) to each flask. Place on a medium hot plate (about 250 °C).
  - Digest until the only remaining acid present is $HClO_4$. (Note: The volume of the liquid in the flask should be less than 1 ml.)
  - Remove from the hot plate and cool almost to room temperature. Add about 25 mL deionized (DI) water and 10.0 mL HCl. Boil gently for about 10 to 20 minutes.
  - Cool the flask and contents to room temperature, dilute to the mark (200 mL) with DI water, stopper and shake well to mix.

- Read the solutions for Copper by Atomic Absorption using standards made up in 5% Hydrochloric acid.
- Read the solutions for Molybdenum, Lead, Zinc and/or Iron on the ICP using standards made up in 5% hydrochloric acid.

- Acid Soluble Copper Assay Method – San Manuel Metallurgical Laboratory
  - 1) Weigh 0.500 grams of pulverized sample into a 50-mL Erlenmeyer flask.
  - 2) Add 10 mL of 15% (V/V) sulfuric acid.
  - 3) Place in a water bath held at 73 degrees Celsius for 5 minutes.
  - 4) Remove the flask from the water bath and immediately filter through a 15-cm VWR No. 413 filter paper into a 100-ml volumetric flask. Wash 3 to 4 times with demineralized water.
  - 5) Cool, dilute the contents of the flask to 100 mL. Stopper the flask and shake well to mix the contents. Place in the Instrument Room and allow the flasks to equilibrate to room temperature.
  - 6) Read by Atomic Absorption using 10.0 micrograms/mL and 30.0 micrograms/mL copper calibration standards in 1.5% sulfuric acid.
  - 7) Calculate the percent acid soluble copper by the formula:
    % ASCu = 0.02 * Cu (micrograms/mL).

The analyses by Skyline of drilling samples, metallurgical test materials, and process solutions were performed under the supervision of Arizona-registered assayers Bill Lehmbeck (#9425) and Jim Martin (#11122) who are both still employed by the laboratory. Analysis of groundwater quality from monitor wells and surface water samples collected by Magma/BHP or its environmental consultants was performed by outside laboratories certified in Arizona to perform environmental water quality analyses. Analysis of metallurgical column test samples (column test heads/tails, feed solution, and effluent/pregnant leach solution) was performed primarily by outside laboratories. The records associated with the analyses performed by outside laboratories are filed in drill log files, attachments to various reports prepared by Magma (1994), or BHP (1997a, c). The amount of documentation varies greatly by laboratory but generally provides the standard metallurgical test methods/protocols, information on sample preparation (weights, size fractions), sample analysis method, method detection limits, analysis units, internal laboratory QA/QC methods, laboratory qualifier comments, and chain-of-custody records. The environmental water quality analyses provide the greatest degree of documentation.

11.2.3 Curis Arizona

Curis Arizona used Skyline for the confirmation assay analyses performed in 2011 and for the check-assay program previously performed for Curis by SRK in 2010 (SRK, 2010). Skyline has provided analytical services to the copper mining industry for 70 years and was used to ensure consistency with prior analytical methods. Skyline has been accredited by the American Association for Laboratory Accreditation in accordance with the recognized International

Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories* since December 2009. Skyline used their standard method (described in Section 11.2.2) for the analysis of TCu (and molybdenum, lead, zinc, and iron as applicable) in percent concentration to two decimal places for all analyses performed for Curis. Skyline used the "San Manuel method" (as described in 11.2.2) in percent concentrations to two decimal places for all ASCu analyses performed for Curis Arizona.

11.3 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

Magma engaged sampling specialist Dr. Francis Pitard of Broomfield, Colorado, to observe procedures and train staff in proper sampling techniques. The training covered sampling techniques for base metal deposits, identifying large- and small-scale variability in sampling procedures, identifying all of the possible sampling errors, and identifying the overall effect on resource estimation.

Magma created TCu control pulp standards at several grade ranges for the Florence deposit to identify and minimize analytical bias and errors. They performed a detailed evaluation of five assay laboratories to select the most qualified. Ultimately, Magma selected Skyline to analyze all samples collected during the Magma feasibility program. BHP subsequently followed the same analysis procedures using the site-specific standards prepared by Magma personnel.

Randomly selected control samples were added to each batch of drill core or RC chip samples that was shipped to Skyline. Every 15th assay sample was an assay control pulp sample that was used to check for analytical bias or variance. The assays from the pulp control samples were required to be within two standard deviations of the overall mean or the entire batch was re-assayed. No field or pulp blanks were created or used by Magma or BHP.

In 2011, SRK reconstituted sufficient materials from the pulp control standards securely stored on site to prepare 10 pulp samples for each of the 7 grade ranges. These pulp standards, along with field blanks (concrete samples), were used as QA/QC samples during the Curis metallurgical and confirmation drilling program. The pulp materials were reblended from bulk materials available on-site and were then repackaged into new pulp envelopes that were given distinctive labels. Control standards and field blanks were inserted into the sample stream on every 20th sample. A review of the 18 analyses for standards used during the program indicated that all but two of the results within one standard deviation of the mean value. All 21 results for the field blanks showed nil copper.

11.4 FACTORS IMPACTING ACCURACY OF RESULTS

Total copper analyses are quantitative analyses performed using standardized methods that can be duplicated from laboratory to laboratory. As mentioned in Section 11.2.2, acid-soluble analytical results are an empirical measurement of soluble copper using various analytical methods performed under timed leaching conditions with variations in heat, time, and acid concentration. There are a number of methods to analyze the acid-soluble component of the total copper content of a rock sample. Varying results can be generated owing to slight differences in the analytical method. ASCu results are therefore viewed to be a relative measure of the minimum component of total copper that is acid-soluble under certain laboratory conditions and which do not necessarily reflect the actual amount of copper that is recoverable under leaching conditions. The important factor is to maintain consistency where possible in methods used on a particular site.

In SRK's opinion, the historical and current sample preparation procedures, analyses performed, and the sample security in place for rock, groundwater quality, and process solution samples followed industry standard procedures then and now, and are sufficient to support the project information database.

12 DATA VERIFICATION

Data verification has been performed by each company conducting exploration and development at the FCP site as described below. During the 2010 and 2011 site visits, SRK verified that historical and current drill core and pulps stored at the FCP site are generally dry and free of animal or moisture damage and are available for verification sampling. An extensive data verification program of the drill logs, assay receipts, and database was not deemed necessary by SRK. One QP for this report (C. Hoag) is personally familiar with the data entry and database verification programs; sampling, data entry, and quality assurance/quality control protocols; and the reanalysis programs undertaken by both Magma and BHP during five years of work on the project.

12.1 PROJECT

Quality Assurance and Quality Control (QA/QC) sampling and data entry procedures were used during the Curis Arizona 2011 drilling program and have been used by all previous operators as described below. The historic protocols primarily utilized deposit-specific pulp standards of known concentrations and the re-assay of a certain percentage of the pulps by a second laboratory. Magma and BHP also used field duplicates to assess the homogeneity of each half of the cored interval. Solution standards and solution blanks were used for analysis during the BHP field test. Curis Arizona used known standards and added field blanks in its drilling program. Data entry verification has been performed by manual checks, double data entry and comparison, and through use of verification formulas and routines in Excel and the proprietary modeling software.

12.2 CHECK ASSAY SAMPLE PREPARATION AND RESULTS

Section 12.2 provides information on the historical, 2010, and 2011 check assay programs.

12.2.1 Historical Check Assay Program

QA/QC procedures used by Conoco included inserting check samples to a secondary laboratory on 10% of its assayed samples. As described in SRK (2010) Conoco used approximately four independent laboratories for total copper (TCu) and acid soluble copper (ASCu) analyses before and during the time in which they set up their own sample preparation and assay laboratory on site.

Magma/BHP QA/QC protocols included inserting a control samples into samples shipped to Skyline. The control samples were prepared to represent seven TCu grade populations within the deposit. The control samples, already prepared as pulp samples and weighed, were inserted at a rate of one control for every 15 samples. The samples were weighed prior to shipment to Skyline and after analysis to ensure the laboratory actually removed material for analysis.

Magma reassayed Conoco sample pulps for its Pre-Feasibility Study and initiated a program to replace Conoco's 50-foot composited ASCu assays with individual 5-foot and 10-foot assays. For the final Pre-Feasibility Study, BHP reassayed pulps from 28 Conoco holes within the proposed first production area. In general, the Skyline TCu assays showed high statistical correlation to the Conoco assay results. The ASCu assays were not well correlated because BHP assayed the individual 5-foot or 10-foot assay intervals rather than the 50-foot composite pulp samples used by Conoco.

12.2.2 2010 Check Assay Program

As summarized in SRK (2010) SRK performed verification sampling for Curis Arizona on the remaining splits from 32 core samples to confirm the presence of copper mineralization. Continuous 5-foot and 10-foot samples representative of the major rock types, oxidation zones, and copper grades were selected from five drill holes within the main deposit area. A comparison of the results of the TCu assays on the original core interval and residual materials for the same sample interval indicate the average difference between the assays was statistically insignificant at less than 0.01% for TCu and 0.05% for ASCu assays. There was a high correlation between the historic and new assays performed on the historic TCu assay pulp standards.

12.2.3 2011 Check Assay Program

During the 2011 Curis Arizona drilling program, SRK reconstituted and reblended the historic powered TCu standards material to prepare new standard samples at the seven grade ranges. Randomly chosen pulp standards were inserted in every 20th sample sent to Skyline. Field blanks (broken, drilled out concrete core) were also inserted every 20th sample. The laboratory analyses were deemed acceptable if they fell within two standard deviations of the mean established value. The 2011 program had two standard analyses that fell outside the first standard deviation but within the second deviation. The remaining standard analyses fell within the first standard deviation of the established mean value. All of the standards analyses were deemed acceptable. The analysis of field blank samples resulted in nil copper for all samples. Skyline provided assay results in electronic format so were not manually reentered by Curis Arizona or SRK. Data entry of geology and geotechnical data was performed by SRK technicians who performed manual comparisons against hard copy logs and digital data entry reviews to ensure correct data entry.

12.3 SRK CONCLUSION

SRK concludes that Curis Arizona and previous owners followed industry standard QA/QC protocols related to sample collection and data verification. Curis Arizona has generated a project database of information that is verifiable and supports the mineral resource statement and Pre-Feasibility Study conclusions presented in this report. The drill hole database, including assays and other information, is of high quality and have been sufficiently verified.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 INTRODUCTION

Curis engaged METCON Research of Tucson, Arizona ("METCON") to confirm the leach parameters that were developed during metallurgical test programs undertaken by past owners of the Florence resource. METCON developed a test leaching apparatus suited for the laboratory simulation of in-situ copper recovery. Traditionally, vertical columns have been used to simulate copper extraction for commercial heap leaching operations. The method developed by METCON allowed for the horizontal flow of solutions through whole core samples, allowing leaching to occur along the naturally occurring fractures in those samples, more closely simulating the directional flow of solutions through the mineralized formation. The oxide samples tested were designed to be representative of the various styles and types of mineralization.

13.2 SUMMARY

Early laboratory tests by Hazen (under direction from Conoco in the 1970s) and McClelland (under direction from Magma in the 1990s) established that approximately 65-70% of the copper in chrysocolla-type mineralization could be leached with dilute sulfuric acid. Later column leaching tests by METCON and Magma's San Manuel metallurgical laboratory, under a variety of conditions yielded copper extractions that ranged from 7% to 66%, depending on copper head grades and mineralogy. As illustrated by Figure 13-1, copper was still dissolving at the conclusion of the short 63- to 158-day leach cycles and even, at the termination of the 203-day column 9 test.

Acid consumptions obtained by the programs during the 1970s and 1990s were variable, but ranged from 3.1 to 43.7 lb/lb Cu, depending on leaching parameters. Magma concluded that their column 9 best represented optimum field conditions with a gangue acid consumption of 4.4 lb/lb Cu that they corrected for the effect of high free acid concentration to give a value of 3.3 lb/lb Cu. Curis later engaged SRK to perform a Preliminary Economic Assessment ("PEA") which included a review of all previous metallurgical testing. In this 2010 assessment, SRK conservatively revised the estimated acid consumption to 5 lb acid/lb Cu.

Leaching tests conducted during 2011-2012 for Curis by METCON have relied on a box technique intended to simulate in-situ conditions more faithfully than conventional vertical column tests by directing leaching solutions horizontally through intact saturated core intervals. The objective was to design a test method that could reliably project extractions and kinetics to a pilot-scale well pattern whose behavior could then be used to predict performance of a commercial ISCR well field.

The importance of testing samples that were representative of a significant fraction of the copper resource was recognized and resulted in testing of core intervals from near the top of mineralization, near the middle vertically, and near the oxide/sulfide contact. This enabled testing a wide range of TCu grades and mineralogy of copper and accessory minerals.

Earlier programs had indicated that the optimum leaching solution acidity was near 10 gram per Liter (g/L) H_2SO_4. In Phase 1 of the Curis program, tests were also run at 5 and 20 g/L acid to explore the effects of free acid concentration on new samples, confirming that 10 g/L free acid still is near-optimum. The middle-depth core sample from each of four drill holes was tested in duplicate with sodium chloride tracer to establish initial porosity and permeability.

Visual examination of the residual samples after leaching and rinsing revealed that no preferential flow paths had developed. Contact of the leaching and rinsing solutions with the core appeared to be thorough and nearly complete. There was strong evidence of diffusion into and out of the blind ends of the core, indicating that diffusion will enhance contact in the least accessible areas of a well pattern. The residues were granular with minimal coarse fragments and few fines. Very little gypsum was observed visually and confirmed by **Q**uantitative **E**valuation of **M**inerals by **Scan**ning electron microscopy ("QEMSCAN") analysis that revealed negligible sulfates, except in the two boxes that had originally contained over 1% calcite by volume.

In comparison with the early copper extractions summarized above for tests performed by Hazen, McClelland, METCON, and Magma, Phase 1 of the Curis program averaged 61% extraction. For boxes within Phase 1 of the Curis program that were leached with 10 gpl acid, the average copper extraction was approximately 70%.

Leaching solutions for the Phase 1 Curis test boxes were made up with sulfuric acid and formation water but did not contain dissolved host rock constituents. As a result, acid consumptions were relatively high. In order to quantify the value of leaching with mature solutions, boxes in Phase 2 of the Curis program were leached with solvent extraction ("SX") raffinate produced from the PLS generated by earlier boxes containing 10 g/L free acid. The boxes leached with 10 g/L free acid and water averaged 11.55 lb acid/lb Cu. Phase 2 boxes leached with 10 g/L free acid and raffinate averaged 9.31 lb acid/lb Cu. A third phase of the Curis program consisted of a series of connected boxes that were leached under conditions similar to the Phase 2 boxes with consumptions that averaged 4.79 lb acid/lb Cu. This compares reasonably well with the acid consumptions obtained by Magma and projected by SRK.

Table 13-1 summarizes the history of metallurgical programs carried out at the project site.

Table 13-1: Florence Metallurgical Program History

Test Program	Laboratory	Purpose	Data Table	Time Frame
Conoco	Hazen	Agitation leach and vat leach process development	-	1971-1974
Magma Small Columns	McClelland	Heap leach and in-situ recovery comparison testing	-	1994
Magma APP Columns	Brown & Caldwell	Enviro. Permit Data: Acid neutralization capabilities, PLS composition	-	1995
Magma Large Columns	Magma San Manuel	Acid cure (135-150 g/l sulfuric) testing	-	1995
BHP Scoping	METCON	Determine optimum acid concentrations	Table 13-2	1996
BHP Phase 1	METCON & BHP San Manuel	Test synthetic raffinate on various mineralized material types	Table 13-3, Figure 13-1	1997
BHP Phase2	BHP San Manuel	Test solution stacking & alternative lixiviants ($AlSO_4$)	Table 13-4	1997
Curis Phase 1	METCON	Confirm optimum acid concentrations and recovery	Table 13-5	2011-2012
Curis Phase 2	METCON	Confirm optimum acid concentrations and recovery	Table 13-6	2012
Curis Phase 3	METCON	Confirm optimum acid concentrations and recovery	Table 13-7	2012

13.2.1 Mineralogy

Core samples were selected by Curis Arizona for mineralogical analysis to identify pre-leach minerals and post-leach mineral residues. The core samples were selected to represent typical ore types including the alteration minerals associated with the mineralizing intrusive event, oxide copper minerals, and associated post-ore iron oxide minerals. Grab samples of unleached core ("heads") were mineralogically characterized by Montana Tech in Butte using *Mineral Liberation Analysis* based on scanning electron microscopy (SEM). Later characterization of samples of leached residues was done by the Colorado School of Mines QEMSCAN laboratory using SEM and energy dispersive X-ray (EDX). The head samples were not necessarily representative of the material that produced the residues. For instance, quartz, which is chemically inert during leaching with dilute sulfuric acid, did not occupy the same volume percentage in heads and residues for the same core boxes. Therefore, a quantitative comparison cannot be made, but some useful generalizations can be drawn as follows:

- Calcite, $CaCO_3$, was generally very minor (usually less than 0.5%) in abundance, but more or less dissolved completely, as one would expect;
- Gypsum was only found in residues from core that contained calcite concentrations greater than 1% (Box #1 and Box #4);
- Tourmaline, a group of complex borosilicates, dissolved completely;
- Muscovite and kaolinite increased in abundance at the expense of orthoclase;

- Phosphates such as apatite, [$Ca_5(PO_4)_3F$], xenotime, [YPO_4], and monazite, [(Ce, La, Nd, Th)PO_4], may have dissolved at least partially;

- Truly refractory (i.e. difficult to dissolve in sulfuric acid) oxide copper species such as delafossite, [$CuFe^{+3}O_2$], were absent from the core;

- Copper associated with biotite, chlorite, and limonite dissolved completely;

- Chrysocolla was sometimes more abundant in the residues than in the heads, but this is deceptive since chrysocolla has a variable copper content and it is likely that copper was more dilute in the residual hydrous copper silicates. Chrysocolla, [$(Cu,Al)_2H_2Si_2O_5(OH)_4 \bullet nH_2O$], contains up to 30% copper in its natural state, but can contain less copper owing to the substitution of aluminum into the mineral structure. QEMSCAN categorizes copper silicates with concentrations down to 10% Cu as “chrysocolla”.

It is important to recognize the role of orthoclase, a potassium aluminum silicate, in consumption of sulfuric acid during leaching. When orthoclase dissolves, the rate is strictly dependent on pH - and hydrogen ion (free acid) is consumed. The reaction products are potassium and aluminum sulfates and silicic acid. Since potassium and aluminum sulfates are much more soluble than calcium sulfate, they do not precipitate from the PLS and therefore do not impair permeability. If free acid is reduced sufficiently, silicic acid will hydrolyze and a colloidal silica precipitate will form, but that also may not reduce permeability.

13.2.2 Historical Metallurgical Testing

Conoco, Magma, and BHP conducted numerous mineralogical studies, bottle roll tests, column leach tests, and chrysocolla dissolution studies during their respective pre-feasibility studies, which are briefly summarized below (Magma, 1994; BHP, 1997d). Representative samples were selected for the test work by geologists familiar with the deposit rock types, mineralogy, alteration, and assay grade populations. The metallurgical tests used NX/NQ–drill core and 6-inch diameter drill core and targeted the dominant rock types and grade ranges. Magma designed the tests to assess leach extraction and acid consumption under heap leach conditions; the tests were performed by McClelland Laboratories, Inc. (“McClelland”) of Sparks, Nevada.

BHP’s later Pre-Feasibility metallurgical program was initiated in 1996 to provide information for the design and planning of the in-situ copper recovery (ISCR) operation. Samples were selected to represent materials to be leached within the first 5 to 7 years of operation. The program was designed to address technical issues that had been identified from previous work. These mainly consisted of estimating the amount of copper-bearing minerals that could be contacted with acidic solutions and the geochemical behavior of fluid-rock interactions. The metallurgical program consisted of mineralogical studies, cation exchange experiments to evaluate reduction of soluble copper losses onto active sites in smectite clays, bottle roll tests to determine copper mineral solubility and acid consumption in a sulfuric acid lixiviant, column leach tests to quantify copper leaching parameters (kinetics and likely leach solution chemistry), and reclamation chemistry. The usefulness of the column test program was limited by the inability to replicate the hydrologic conditions and porosity existing in the saturated resource. Solution velocities, contact time, and fluid-to-rock ratios can be considerably different in unsaturated column tests or heap leach materials compared with in-situ conditions.

13.2.2.1 Small Scale Column and Bottle Roll Tests

Various leaching tests and mineralogical characterization studies were carried out by Hazen Research, Inc. (Hazen) from 1971 through 1974. The Hazen laboratory work consisted of bottle roll and mechanically agitated leaching tests, which ultimately resulted in a pilot-scale vat-leaching test by Conoco in 1976.

In 1994, McClelland conducted bottle roll tests and column tests as part of a study that was designed to compare the feasibility of an open pit, heap leach operation with in-situ leaching and recovery (Magma, 1994). The tests were made on drill core samples obtained during the Magma Pre-Feasibility assessment and were intended to complement the Conoco effort.

In 1995, column tests were performed under the direction of Brown and Caldwell ("BC") (1996) as a part of the work needed to apply for an Aquifer Protection Permit (APP). Seventeen of the tests examined the acid neutralization capacities of various rock types and the basin-fill sedimentary units overlying the oxide zone. Two other column tests were run in order to determine PLS composition after leaching at pH 1.5 with recycled SX raffinate. Head assays were not obtained, but the columns produced maximum PLS grades of 3.8 g/L Cu and 8.4 g/L Cu and the extracted copper content of the samples equated to 0.56% TCu and 0.84% TCu, respectively.

The laboratory tests conducted by Hazen, McClelland, and BC followed procedures normally used to enable scale-up of metallurgical response to conventional vat, heap, or agitated leaching and generally did not yield data of direct use in designing ISCR facilities. For example, solution flowing between injection and recovery wells must pass through typically 50 to 100 feet of mineralized formation without pH adjustment, whereas the early tests incorporated periodic acid addition to maintain a nearly constant free acid concentration. Nonetheless, those tests did provide useful information about response variability, gangue acid consumption, and maximum likely copper solubilization.

The Conoco studies defined six "metallurgical zones" as follow:

- Zone 0 Overburden
- Zone 1 Copper oxide mineralization
- Zone 2 Mixed copper oxides and iron oxides
- Zone 3 Dominant iron oxides, with no visible copper oxides
- Zone 4 Transition with copper oxides and sulfides
- Zone 5 Sulfides only

The Hazen work for Conoco and the McClelland program showed that samples from Zones 1 and 2 with dominant chrysocolla (and other copper-bearing silicates) typically allowed copper dissolutions representing 65–70% of the total copper with average residue assays of about 0.15% TCu. Approximately 40–45% of the copper in Zone 3 samples dissolved.

The BHP team then set out to design experiments that would more closely simulate in-situ conditions by saturating the column sample with leaching solution, by using lower solution flow rates, and by altering solid/liquid contact and fluid retention. The last two techniques involved coating large-diameter core samples with epoxy and filling the cavities in the column charges with inert silica sand.

13.2.2.2 Large-scale Column Tests

Four 6-inch diameter by 10-foot high column leach tests were performed by Magma on crushed 1-inch drill core using San Manuel raffinate and a 135-150 g/L sulfuric acid cure. Copper extractions of 64% to 73% were obtained under these conditions. Six-inch diameter drill core was also used in a large column (3 feet by 20 feet) using the same conditions yielding a calculated TCu extraction of 67% (BHP, 1997c).

Fourteen column tests were performed by METCON and the BHP San Manuel Metallurgical Lab. The materials tested included 12 Magma and BHP drill core representing primarily quartz monzonite ("QM") with small amounts of tertiary granodiorite porphyry (Tgdp), diabase, and andesite; whereas two columns contained primarily granodiorite porphyry. Column leach testing conducted since 1996 by BHP was organized in three phases:

- Scoping Phase: 60-day tests to determine raffinate-rock reactions and PLS composition;
- Phase I: determine leaching behavior of mineralization representative of the first mining area; and
- Phase II: evaluate alternative lixiviants.

The first four column tests, representing the Scoping Phase of the program, were conducted by METCON on minus 2-inch sample. Columns 1, 2, and 3 began with de-ionized water that was acidified with sulfuric acid to concentrations of about 5, 10, and 20 g/L H_2SO_4, respectively, whereas Column 4 was treated with raffinate from the San Manuel SX/EW plant. The head assays of the quartz monzonite sample were 0.398% TCu, 0.058% S, and 1.51% Fe. The columns were leached for approximately 60 days and copper was continuously removed by SX. It should be noted that copper was still being dissolved at the end of the test period. It is also noteworthy that the San Manuel raffinate with 80 g/L total sulfate had a leaching effectiveness (percent copper dissolved) mid-way between the results for 5 g/L and 10 g/L acid, despite containing only 2.9 g/L free H_2SO_4.

Of the four tests, as shown in Table 13-2, the 20 g/L H_2SO_4 leaching solutions used in Column 3 dissolved the most copper, but at the expense of higher acid consumption. The BHP metallurgists concluded that the leaching solution containing about 10 g/L acid offered the best balance of copper dissolution, acid consumption, and cation loading (summation of cation concentrations in the final raffinate). Therefore, the final PLS composition from Column 2 was used to synthesize raffinate for the subsequent Phase I column tests.

Table 13-2 summarizes the results obtained during the Scoping Phase. Total solution applications averaged 16.5 pore volumes (PVs) or 4.08 liters/kg solids.

Table 13-2: Summary of Results from Scoping Phase Columns, METCON

Column #	Rock Type	Head Grade % TCu	Acid Concentration gpl	Days	% TCu dissolved	lb acid/ton material	lb acid/lb Cu
1	QM	0.398	4.8	63	45.8	11.0	3.1
2	QM	0.398	9.7	63	54.5	17.2	4.1
3	QM	0.398	19.7	63	66.2	30.4	6.0
4	QM	0.398	2.9	63	48.7	7.6	3.3

Source: Compiled by SRK from BHP 1997d

The Scoping Phase tests were followed by Phase I column tests designed to examine copper leachability from samples representing major resource types. Columns A and B were run by the BHP San Manuel Lab, and column tests 5-10 were performed by METCON. The sample origins included 6-inch core from diamond drill holes MCC-534 and BHP-2, which were within the first planned mining block. Synthetic raffinate was made according to the final PLS compositions of previous tests, but without copper. In Table 13-3, the origin of the synthetic raffinate is shown as follows: that for Columns A and B resembled the composition of the final solution from column 2; the final column A solution was synthesized to start columns 8 and 9. Usually, the initial raffinate was made by dissolving reagent-grade chemicals in de-ionized water. However, column 10 was initiated with the solutions produced by columns 8 and 9. Column tests 5, 6, and 7 evaluated the response of very low-grade mineralization with head assays, respectively, of 0.15% TCu, 0.16%T Cu, and 0.126% TCu.

Table 13-3: Summary of Results from Phase I Column Tests

Column	Rock Type	Head Grade %TCu	Raffinate Source (column #)	pH	Days	PVs	Liters/kg	% TCu dissolved	lb acid per ton	lb acid per lb Cu
A	QM	0.301 (calc)	2	1.4	84	13.0	4.40	35	2.5	7.6
B	QM	0.141 (calc)	2	1.5	84	12.9	4.23	34	10.5	15.2
5	QM	0.155	2	1.5	59	12.9	3.49	46	16.6	26.0
6	QM	0.164	2	1.5	26	6.4	1.36	7	36.0	7.8
7	Tgdp	0.126	2	1.5	39	9.3	2.98	28	23.5	18.4
8	QM	0.216	A	1.7	158	35.2	8.00	54	1.6	43.7
9	QM	0.243	A	1.7	203	24.7	5.80	60	2.9	17.1
10	QM	0.305 (calc)	8+9	1.5	119	11.7	4.09	56	9.1	31.2

Source: Compiled by SRK from BHP 1997d

Columns 8, 9, and 10 were tested by METCON using average-grade chrysocolla-bearing quartz monzonite containing approximately 0.32% TCu from 6-inch diameter drill core. The voids were filled with inert sand (Columns 8 and 9) and tap water was used prior to raffinate application to simulate saturated conditions. The columns were 12-inch diameter by 5-foot tall (Column 8) and 12-inch by 10-foot tall (Columns 9 and 10). The material was then subjected to a simulated locked cycle in-situ leaching regime to assess the rate of copper dissolution and acid consumption. Leaching times ranged from 158 days for column 8 and 203 days for column 9. Copper extraction ranged from 54% to 56% with acid consumption ranging between 2.83 and 15.6 kg/metric ton of material (BHP, 1997c).

Although the tests were terminated when PLS copper grades were near or below 0.1 g/L, copper extraction rates were still significant at the end of each test. This was because the relatively large volume of leach solution that filled the column void spaces contained a significant mass of copper, even at low copper concentrations. The copper extractions attained during these column tests therefore do not necessarily represent the maximum amount of copper that can be produced by in-situ leaching and subsequent recovery.

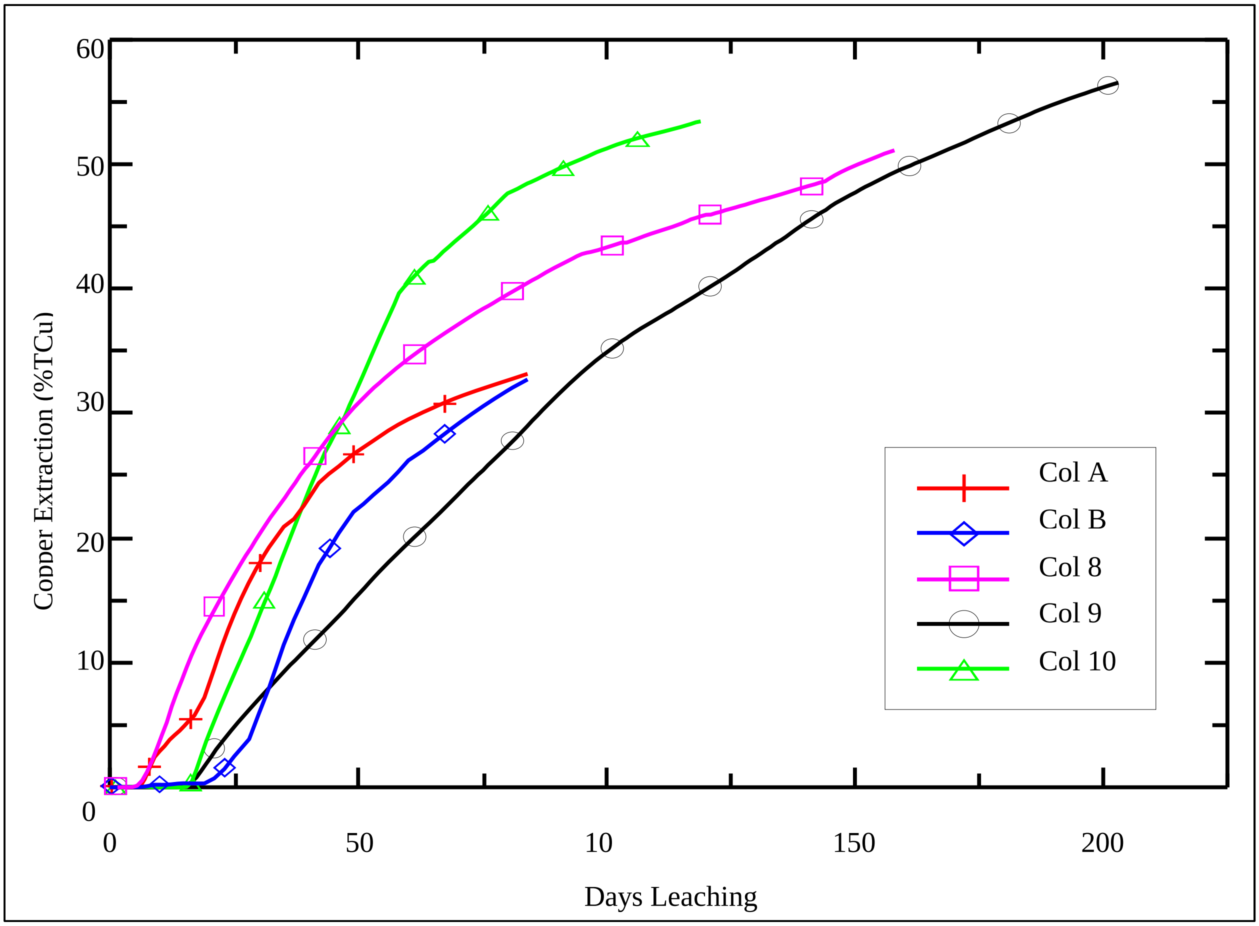


Figure 13-1: Total Copper Extraction Curves of Phase I Large-Scale Column Tests

The BHP Phase II column tests were designed to determine the effectiveness of aluminum sulfate for pretreating typical chrysocolla mineralization to occupy active sites that would otherwise attract exchangeable cations, specifically calcium and copper. Copper extraction curves were similar to those illustrated in Figure 13-1, with relatively high rates of extraction still present at the termination of the tests.

The columns were operated sequentially to simulate solution "stacking", where low-grade PLS is reconstituted with acid and returned to the formation in an effort to increase the PLS grade. The two column tests were carried out at the BHP San Manuel Metallurgical Lab. The results are summarized in Table 13-4.

Table 13-4: Summary of Results from Phase II Column Tests, BHP San Manuel

Column	Rock Type	Head Grade %TCu	Raffinate Source (column #)	pH	Days	PV	Liters/kg	%TCu dissolved	lb acid per ton	lb acid per lb Cu
C	QM	0.386 (calc)	A	1.5	133	31.8	7.25	52	1.77	7.08
D	Mixed QM + Tgdp	0.296 (calc)	C	1.7	126	28.1	6.22	35	-	-
Combined									3.30	10.13

Source: Compiled by SRK from BHP 1997d
QM – quartz monzonite
Tgdp – Tertiary granodiorite porphyry

The copper extractions were compared to the total copper content that was estimated from residue analyses and the total copper mass contained in solutions. Copper was still being extracted at the termination of each column test, albeit at low copper concentrations. The copper extractions obtained from these column tests should not be considered the ultimate copper extractions, but rather those that are measured under specific test conditions.

Estimates of copper dissolved for the Florence ISCR project are based on previous observations and experiments conducted by a cohesive multi-disciplinary staff. Conceptually, copper extraction during in-situ leaching is very easy to estimate. When acidic solutions are placed in contact with chrysocolla and are subsequently pumped from the ground, 100% extraction should be attained. Estimating the proportion of copper contained in a given volume of rock that meets those conditions is more complex and requires estimating the proportion of copper contained in fracture-controlled chrysocolla, the proportion of those fractures contacted with acidic solutions and/or available to be contacted, and the proportion of extracted copper that is contained in PLS of an economic grade.

Acid generation potential, column leaching response, and attenuation studies were performed by BC to assess potential environmental effects and to support the APP application process. The Magma/BHP studies evaluated interactions among the various rock units present in the Florence deposit to assess copper extraction, sulfuric acid consumption and raffinate chemical characteristics over time. Two types of column leach studies were undertaken to 1) monitor reactions between acidic raffinate and bulk rock samples and 2) monitor reactions that simulated leach field remediation.

Geochemical simulations were performed by BC (1996b) and BHP consultants (BHP, 1997d) to 1) assess solution control, chemical reactions, mass balance, and water balance issues during operations, 2) simulate block closure, and 3) assess the post-closure solute transport. The numerical simulations will be briefly reviewed below.

The well field copper extraction and remediation simulations were performed for a 100-foot spaced 5-spot system, and at a flushing flow rate of 40 gpm. Chemical and kinetic transport simulations were undertaken using the same inputs.

BHP's extraction simulation predicted that it would take 15 years to achieve extraction of all copper available for recovery. It should be noted that the kinetic model estimated that 50% of the extractable copper could be obtained within the first two years, and that this would entail recovering the contained copper primarily within the first year from chrysocolla mineralization located on rock fractures ("fracture chrysocolla"); the remaining copper would dissolve from the chrysocolla in the rock matrix ("matrix chrysocolla") over a longer period. The model was sensitive to decreases in rock porosity; the simulations predicted porosity would decrease by approximately 50% in two years. The models were also sensitive to clay rate constants. The five-year copper recovery rate was estimated to be 50% if a high clay dissolution rate was used, compared to 85% for the base case (Lichtner et al, 1997).

The remediation simulation predicted that background sulfate levels and neutral pH were achievable within 60 and 133-150 days, respectively.

13.2.3 Curis Metallurgical Test Program

As described in the previous section, earlier laboratory tests conducted by Hazen, McClelland, and BC followed procedures normally used for determining metallurgical response to conventional vat or heap leaching and were not ideally suited for simulating in-situ extraction characteristics. Later column leach tests by BHP San Manuel and METCON attempted to simulate in-situ extraction characteristics using conventional vertical columns that were modified to operate under saturated conditions. Solution flow through the in-situ mineralized material at Florence Copper will generally be horizontal in nature. It was postulated by Curis that earlier column test programs were not analogous in flow characteristics as they simulated solution passing vertically through the mineralized material column. Also, Curis recognized the need to develop an alternative to column leaching methods in order to keep the highly fractured core samples intact to a greater degree than in previous tests.

13.2.3.1 Rationale for Using Core Boxes Instead of Columns

Traditionally, vertical transparent plastic columns have been used to simulate heap leaching of copper and gold, based on a body of laboratory procedures and industrial experience that was pioneered in the 1960s and 1970s and extensively developed during the 1980s and 1990s. This technique was naturally used by McClelland, METCON, and BHP's San Manuel laboratory during the 1990s to test leaching response of Florence core samples. Magma/BHP recognized some of the shortcomings of column simulation of in-situ copper recovery and conducted some column tests on core fragments that had been treated with epoxy to coat or fill post-drilling fractures.

The Curis Florence team concluded that further testing with conventional columns would add little to reliable projection of ISCR field performance for the following reasons:

- Since the inventoried core is naturally fractured, but still intact, the importance of testing it in that condition was clearly recognized;

- Wrapping core sections in plastic mesh would preserve the size, shape, and tight compaction of the fragments, obviating the need for epoxy coating or filling that might reduce natural porosity;

- Vertical columns would not be appropriate containers for wrapped core sections because of mismatched diameters and the risk of fluid channeling through the annulus between the core surface and the column wall;

- Vertical columns do not reliably mimic horizontal flow of solutions through a fractured mineralized formation;

- Vertical columns would not allow leaching under a regulatory limit of 0.65 psi (1.50 feet of solution head at s. g. = 1.00) per linear foot of injection well;

- Unloading a column inevitably mixes the fragments of residue and impairs the metallurgist's ability to study the physical condition of the residue and to observe any cementing or precipitation that may have occurred during leaching and rinsing;

Rectangular boxes, wherein multiple sections of undisturbed fractured core could be contacted by leaching solution flowing normal to the long axis of the core, offered a configuration that overcame the shortcomings of conventional columns. It was understood at the outset that this approach would prevent collection of a representative head sample and that accurate estimation of daily copper extraction would not be possible. A reliable metallurgical balance could be obtained at the conclusion of leaching and rinsing by taking account of all solution volumes and assays, along with the weight and assay of a properly sampled residue.

13.2.3.2 Curis First Phase: Boxes 1-16

The Curis metallurgical test program performed by METCON is divided into three phases. The goal of this program is to better simulate in-situ leaching of Florence copper oxide mineralized material by forcing dilute sulfuric acid solution to flow horizontally through intact pieces of drill core material.

For the first phase of this program, core samples were selected from four of the six holes drilled in the spring of 2011. Drill holes CMP11-01, CMP11-02 and CMP11-03B were located near the former BHP field test, while hole CMP11-05 was located on Arizona State Land (under mineral lease to Curis) near the planned PTF. A total of 16 uniquely designed leach boxes were then built, with dimensions of 28 in (L) x 16 in (W) x 4.5 in (H), each containing four pieces of drill core taken randomly from adjacent 5-ft core intervals. This resulted in four boxes for each of the four drill holes, with the material representing mineralogical changes expected in the vertical profile through the oxide zone. One box was loaded using material from the top of the oxide zone, two were from the approximate middle portion of the oxide zone (including one duplicate sample for tracer testing), and one box was taken from material at the bottom of the hole near the contact with the underlying sulfide zone. The drill holes intercepted representative examples of quartz monzonite and granodiorite porphyry similar in character to these rock types noted elsewhere in the deposit. Care was taken not to mix the two mineralized types in any given box so that the leach characteristics of each type could be independently evaluated. The typical core diameter was 3.4 inches, although a single hole was drilled at 2.5 inches in diameter.

Individual core intervals were highly fractured and could not be lifted from their storage tubes without severe disturbance and a resulting increase in effective porosity. As shown in the appendix file of the *Metallurgical Testing and Summary Report* (Dixon, 2011), each core interval was therefore wrapped in plastic screen material to keep the core intact during the initial loading, leaching, and future unloading of the leach boxes. Every leach box has a bottom layer of paraffin wax to support the weight of the core sections and to prevent solution from channeling underneath the core sample. The ends of the box were also filled with paraffin wax to confine flow to the central section of the sample. Any interstitial spaces and large gaps between the core fragments were filled with silica sand to encourage solution flow through the core sections themselves.

Three of the four boxes constituting each hole were started with locked cycle leaching utilizing 5 g/L, 10 g/L, and 20 g/L sulfuric acid solutions. The fourth box was first subjected to inert tracer testing with NaCl prior to leaching with 10 g/L sulfuric acid solution. The purpose of these tracer tests at the beginning of the test program was to estimate hydrological parameters for the core samples. Tracer testing would have been repeated at the end of selected leach tests to identify any change in flow characteristics due to precipitation, however, no evidence of any changes was observed, negating the need for post-leach tracer tests. Pressure in the box was maintained at 0.45 psi by raising the outlet tube 1 foot above the leaching box. Pregnant leach solutions were subjected to solvent extraction whenever the dissolved copper exceeded 1.8 g/L in concentration per the flow schematic in the appendix file *Metallurgical Testing and Summary Report* (Dixon, 2011).

Total calculated copper as determined by METCON for boxes 1-16 ranged from 0.28% to 1.22%, with an average of 0.59%, while total iron ranged from 0.72% to 3.97%, with an average of 1.94%. Samples were also submitted for mineralogical examination at Montana Tech of the University of Montana. The copper in most head samples consisted of non-sulfide minerals including chrysocolla, Cu-bearing biotite, Cu-bearing iron oxides, and Cu-bearing chlorite. Three head samples contained copper sulfide minerals, primarily chalcocite and chalcopyrite. Two of the boxes with sulfide minerals (boxes 1 and 4) had relatively low copper extractions of approximately 47% and 35% respectively. The sulfide samples tend to originate from the thin oxide/sulfide transition zone at the base of the current resource and are not representative of the resource as a whole.

As of November 26, 2012, boxes 1-16 had been completed and fully evaluated after undergoing locked-cycle leaching for approximately 150 days. As shown in Table 13-5, copper extractions ranged from 33% to 89% with an average of approximately 61% for all 16 boxes. Copper extraction for those boxes within this set that were run at 10 g/l acid averaged approximately 70%. Acid consumption averaged 14.55 lb H_2SO_4/lb Cu for all 16 boxes and 11.55 lb H_2SO_4/lb Cu for those boxes within this set that were run at 10 g/l acid.

Tests were run with leach solutions made up of acid and water resulting in relatively high acid consumption ratios, because no raffinate was yet available for testing. Further testing (boxes 17-20) started in late-2011, using more mature leach solutions generated from leach boxes 1-16 in order to confirm acid consumption under more commercially relevant conditions. Higher feed acid concentrations have generally been shown to increase overall acid consumption without significantly increasing copper extraction.

Observations made after boxes 1-16 were completed showed the leached core to consist of granular to moderate sized particles with minimal coarse material or fines. This is documented in the appendix ("leach residue" photo file) to Dixon's report (2011). No signs of preferential solution pathways (based on color and supported by tracer testing) were observed. This suggests thorough contact between the leach solution and core sample along with strong evidence of diffusion. Gypsum precipitates were occasionally observed, mainly in the end sections of the core which were outside of the direct solution pathway. Subsequent mineralogical work performed at the Colorado School of Mines confirmed that sulfates, including gypsum, jarosite, and ferro-alunite, are very minor in the residues, except in two boxes containing core with over 1% calcite.

Table 13-5: Laboratory Test Results: Curis Phase 1

Test No.	Feed Sulfuric Acid (g/l)	Leach Cycle (Days)	Rinse Cycle (Days)	Calculated Head Assay (%Cu)	Gangue Acid Consumption lb/lb Cu	Cumulative Extraction (%Cu)
Box 1	5	152	43	0.46	8.88	47.47
Box 5	5	152	44	1.22	3.47	44.76
Box 9	5	186	46	0.77	3.89	63.51
Box 13	5	176	37	0.33	19.56	32.94
Box 2	10	152	79	1.00	6.95	88.72
Box 3	10	152	43	0.58	9.62	81.32
Box 6	10	152	79	0.32	15.94	71.68
Box 7	10	154	42	0.52	18.29	59.79
Box 10	10	134	78	0.55	9.32	63.54
Box 11	10	186	46	0.87	8.56	84.26
Box 14	10	134	78	0.47	5.04	47.79
Box 15	10	228	8	0.38	18.68	68.48
Box 4	20	152	78	0.49	40.54	34.74
Box 8	20	154	78	0.74	15.48	77.01
Box 12	20	176	37	0.48	29.34	48.30
Box 16	20	227	8	0.28	19.22	66.95

13.2.3.3 Curis Second Phase: Boxes 17-20

The second phase of the Curis metallurgical program consisted of four boxes run on core samples from drill hole CMP11-06 which was located on Arizona State Land (under mineral lease to Curis) near the planned PTF. The purpose of this phase was to confirm acid consumption using raffinate obtained from the first phase of testing. As of November 26, 2012, boxes 17-20 have been completed after undergoing locked-cycle leaching for approximately 150 days. Total calculated copper head assays, as determined by METCON for these boxes, ranged from 0.25% to 0.44%, with an average of 0.37%, while total iron ranged from 1.57% to 2.18%, with an average of 1.77%. As shown in Table 13-6, copper extractions ranged from 51% to 70% with an average of approximately 61% while acid consumption averaged 9.31 lb H_2SO_4/lb Cu for all 4 boxes.

Table 13-6: Laboratory Test Results: Curis Phase 2

Test Number	Feed Sulfuric Acid (g/l)	Leach Cycle (Days)	Rinse Cycle (Days)	Calculated Head Assay (%Cu)	Gangue Acid Consumption (lb/lb Cu)	Cumulative Extraction (%Cu)
Box 17	10	157	179	0.44	9.77	62.58
Box 18	10	157	123	0.25	12.26	51.26
Box 19	10	157	179	0.36	7.77	70.45
Box 20	10	157	179	0.44	7.44	57.96

13.2.3.4 Curis Third Phase: Boxes 21-24

The third phase of the Curis metallurgical program consisted of four boxes run on core samples from drill holes CMP11-01, CMP11-02, CMP11-03 and CMP11-05. The purpose of this phase was to explore the movement of the “acid front” through the mineralized material over time in addition to gaining insight on solution stacking by running four leach boxes together in series. This test phase confirmed the effect of mature leach solutions on acid consumption by using more mature raffinate than the solutions used for boxes 17-20. As of November 26, 2012, boxes 21 and 22 have been completed after undergoing locked-cycle leaching for 195 days, while boxes 23 and 24 are undergoing further rinse testing. Total calculated copper as determined by METCON for boxes 21-22 ranged from 0.49% to 0.59%, with an average of 0.54%, while total iron averaged of 1.60%. As shown in Table 13-7, copper extractions ranged from 81% to 90% with an average over 85% while acid consumption averaged 4.79 lb H_2SO_4/lb Cu in both boxes.

Table 13-7: Laboratory Test Results: Curis Phase 3

Test Number	Feed Sulfuric Acid (g/l)	Leach Cycle (Days)	Rinse Cycle/HCl Treatment (Days)	Calculated Head Assay (%Cu)	Gangue Acid Consumption (lb/lb Cu)	Cumulative Extraction (%Cu)
Box 21	10	195	100	0.59	3.97	90.46
Box 22	10	195	100	0.49	5.60	80.88

The next set of boxes after Phase 3 started in late 2012 and tested the effects of pretreatment methods using weak acetic and hydrochloric acid solutions for reducing the amount of calcium in the mineralized material prior to the copper leaching stage. The goal for this test series was to minimize the amount of gypsum precipitation that will occur over the life of a commercial mineralized material block impacting solution flow characteristics, improving sweep efficiency, increasing copper extraction and possibly reducing final rinse times. These tests are still on-going and results are expected in the third quarter of 2013. Results from boxes 1-16 have shown that gypsum formation has not been a significant factor.

13.3 METALLURGICAL RECOVERY ESTIMATION

Prior to the Curis metallurgical test program, the copper recovery used for this project was based on the curve developed by Lichtner (the "Lichtner Curve") using Magma column leach data. It is this curve that was used to extrapolate copper recovery for a commercial leach block over a 6 year leach cycle from relatively short term laboratory leach test data. This curve was based on the assumption that the grade of a commercial mineralized material block is 0.38% total copper and 0.255% acid soluble copper. Block dimensions were assumed to be 100 ft x 100 ft x 100 ft with a bulk density of 12.5 cu ft/ton. Leach solution application rate was assumed to be 0.1 gallons per minute per linear foot of injection zone thickness. The Lichtner Curve was used to determine the percentage of total copper that was recoverable. To this number was applied a factor that estimated the amount of leachable copper mineralization that would dissolve in the stated leach cycle time frame when contacted by solution. A second factor was applied to adjust for the amount of mineralized material that would be contacted effectively ("sweep efficiency") by solution. A third factor was applied to adjust for copper contained in solution that would be recovered as cathode after losses from solution control factors and bleed to evaporation ponds were taken into account.

The copper recovery projection derived by Magma Copper Company was therefore the product of [Copper Extraction] x [Sweep Efficiency] x [Solution Recovery], where [Copper Extraction] was the product of (1) potentially soluble copper and (2) the probability that this copper would dissolve in five years. This projection assumed that copper extraction would be 61.6% of total copper, that pattern sweep efficiency would be 80%, and that solution recovery would by 95%. The assumed sweep efficiency was based on oil field experience and the soluble copper recovery loss of 5% was intended to account for solutions sent to the evaporation pond. It is now possible to provide a revised projection based on tests completed by METCON using the core box technique.

Accordingly, METCON derived copper extraction curves for all eight boxes that had been leached with a solution containing 10 g/L free H_2SO_4. This was done using *Metsim©* software, which has been employed by METCON for the last 15 years as a method to project copper extraction measured in laboratory columns to the recovery expected to be seen in commercial heaps. A validation step was applied wherein terminal extractions are projected using the copper extractions obtained in the tests during the first 80%, the first 90%, and 100% of the leaching days. Experience has shown that, if the three projections agree within ± 7%, the data are mature and acceptable for a valid projection of commercial performance (Iasillo and Carneiro, 2001).

Copper extraction data from all eight boxes passed the test within acceptable limits so they were incorporated into a single curve (Figure 13-2) based on 195 days of leaching, followed by water rinsing to remove residual dissolved copper. This resulted in a curve that exceeds 80% copper extraction at 422 days and asymptotically approaches 83.44%. The consolidated *Metsim©* projection for copper extraction was then converted to a projection of copper recovery by applying the sweep efficiency and solution recovery factors shown in Table 13-8.

Table 13-8: Projected Copper Recovery

Year*	Cu Extraction (%)	Sweep Efficiency (%)	Solution Recovery (%)	Cu Recovery (%)
0	0	0	0	0
1	78.34	54	95	40.19
2	83.03	75	95	59.16
3	83.41	84	95	66.56
4	83.43	88	95	69.75
5	83.44	89	95	70.55
6	83.44	90	95	71.34

* Note that Year 1 begins after 3 months of pre-production leaching.

In effect, the core boxes provided 100% sweep efficiency, so it is necessary to apply the adjustments in Table 13-8 to the copper extraction projections to reflect the anticipated well field conditions. Based on the copper extraction results given in Table 13-6 and Figure 13-3, the leach cycle time for the commercial operation has been reduced from 6 years to 4 years. This was done because incremental copper recoveries in the fifth and sixth year are each projected to be less than one percentage point and therefore less than the break-even operating costs.

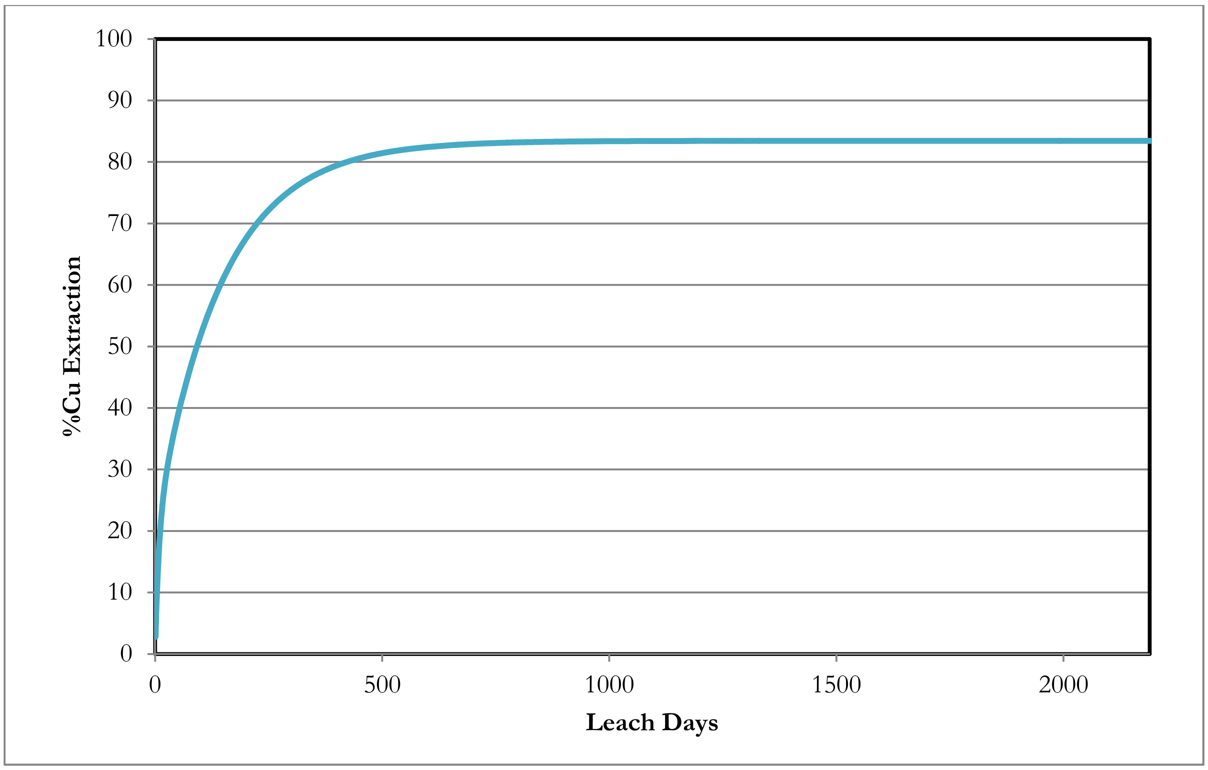


Figure 13-2: Total Copper Extraction Versus Time Using 10 g/l Sulfuric Acid Solution

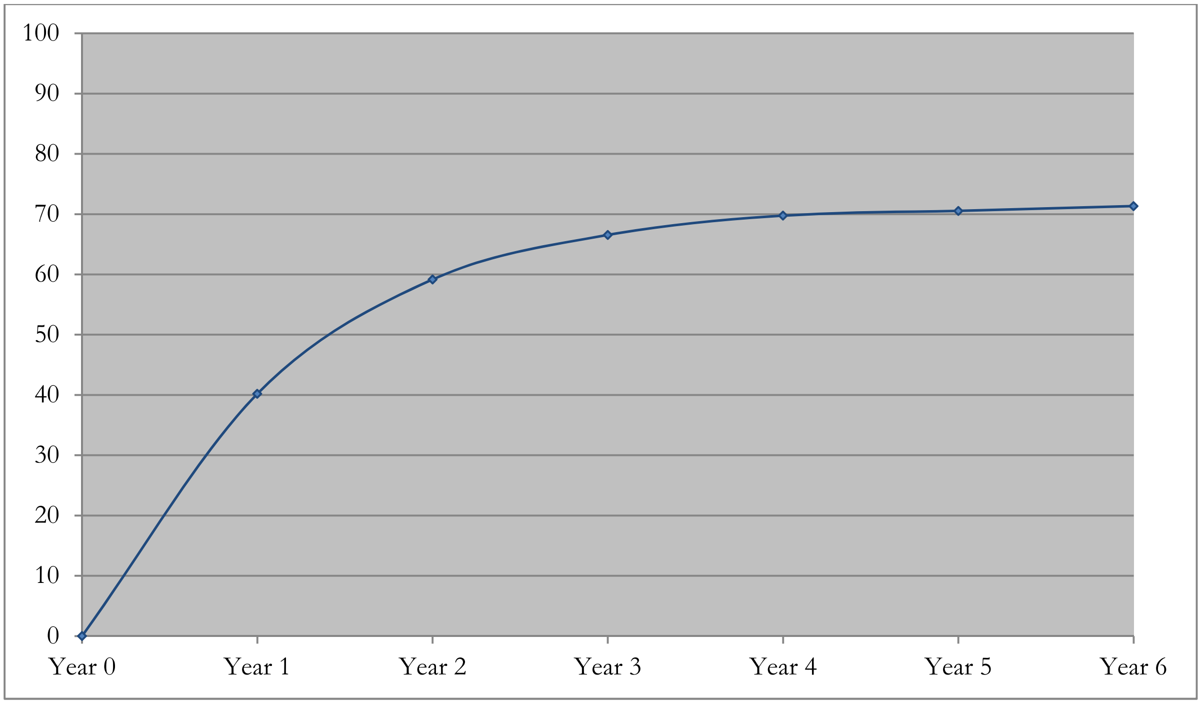


Figure 13-3: Total Copper Recovery vs. Time Using 10 g/l Sulfuric Acid

13.4 RECOVERY RECONCILIATION

Magma's projected TCu recovery, see Section 13.3, was based on the following assumptions: (1) 67% of the TCu would be acid soluble; (2) 92% of the acid soluble copper would dissolve in 6 years; (3) 80% of the resource would eventually be contacted (sweep efficiency), and (4) 95% of the extracted dissolved copper would be recovered after solution losses and bleed to evaporation ponds. Curis considers the last assumption to be realistic, but believes that the first three were assumptions based on the laboratory and other evidence available at the time and may not be applicable now to in-situ leaching of a saturated and highly fragmented formation based on the results of the recently completed laboratory test work.

Magma's estimate of acid soluble copper was based on a conventional determination in common practice during the 1970s to late 1990s. It is widely recognized that ASCu procedures are only approximate unless they are "tailor made" for a specific deposit, and Magma did not determine residue mineralogy in order to confirm what minerals actually dissolved in this particular procedure. Current work being done by METCON equates total soluble copper (TSCu) to acid soluble copper plus cyanide soluble copper, reflecting more accurately the total amount of copper that will dissolve over an extended time period. This concept is now used in the copper industry, but was not commonly understood prior to the late-1990s.

Magma's assumption that only 92% of the soluble copper (by assay) would actually dissolve appears in retrospect to be potentially a conservative discount and does not recognize the likelihood that more refractory non-sulfide copper species will dissolve when in contact with free acid for a period of months or years. Application of the first and second assumptions leads to an estimate that only 0.67 x 0.92 = 0.616, or 61.6% of the TCu will dissolve, which is not supported by current METCON results.

Magma's assumption of 80% sweep efficiency was apparently based on oilfield experience with a viscous fluid that is being drawn through consolidated sandstones and shales, not a low-viscosity aqueous solution that is flowing through highly fractured rock.

Curis and its consultants believe that the projected copper recoveries presented in Table 13-8, and based on extrapolation of current laboratory results and application of gradually increasing sweep efficiency, more reliably predict long-term copper recovery from a commercial-scale ISR well field. The objective of the Pilot Test Facility is to confirm this prediction.

13.5 RECOMMENDATIONS

Four years is a long leach cycle time compared to most existing commercial leaching operations. This requires a greater reliance on modeling to extrapolate copper recoveries developed from short-term laboratory leach tests to those expected during long-term commercial operations. METCON's projection of copper extraction was developed using the assumed application rate of 0.1 gallon per minute per linear foot of injection zone thickness. Increasing the rate to the permitted maximum of 0.15 gallon per minute per linear foot may help to reduce leach cycle terms although this needs to be confirmed with actual field testing. The sweep efficiency discussed in the previous section was meant to be conservative and may be increased with further field testing. This would have a direct impact on overall copper recovery. Removal of calcium prior to leaching with commercial solutions may help to improve copper recovery by reducing subsequent gypsum formation that could hinder solution flow characteristics; however, on-going laboratory pretreatment testing has not been successful.

The Florence mineralized body is also relatively "clean" and free of deleterious elements that typically lead to cathode quality issues. The current on-going metallurgical program does not indicate the presence of radionuclides in concentrations warranting treatment or exceeding levels established by the ADEQ in the APP.

The metallurgical testing program at METCON has been underway for nearly 18 months and has been very successful. Going forward, the project should consider:

1) Surfactants (chemicals that reduce the surface tension of water) that may increase leaching effectiveness. Surfactants may increase the rate of penetration of leaching solutions into coarser rock fragments, thereby potentially either increasing the rate of copper extraction or the ultimate total copper extraction, or both. Several types of surfactants used for this purpose in the petroleum industry are now being screened in batch tests and may be evaluated in core boxes.

2) Acid consumption under realistic well field hydrostatic head conditions. The reaction of calcium carbonate, *calcite*, with dilute sulfuric acid proceeds according to the following reaction:

$$CaCO_3 + H_2SO_4 = CaSO_4 + H_2O + CO_2.$$

It is well known that increasing pressure will retard chemical reactions that yield gaseous products, carbon dioxide in this case. For example, in-situ leaching 400-feet below the surface of an aquifer would be under a hydrostatic head of 173 psi, assuming a solution specific gravity of 1.00. Leaching tests in an autoclave may reveal that acid consumption under well field conditions may be lower than occurs at ambient pressure. If so, acid consumption may be lower than currently projected and rinsing of a leached zone may be easier. Reduced competition by calcite could possibly increase copper extraction, as well.

3) Use of sodium bicarbonate to improve rinsing effectiveness. If gypsum formation is more pronounced that it has been in tests to date, it is possible that gypsum could be destroyed by sodium bicarbonate according to the following reaction:

$$CaSO_4 \bullet 2H_2O + 2NaHCO_3 = Na_2SO_4 + CaCO_3 + 3H_2O + CO_2.$$

Sodium bicarbonate solutions decompose under ambient conditions if the concentration is too high. A positive pressure will suppress the decomposition, allowing the above reaction to proceed. This could enable quicker reduction of residual sulfate levels during rinsing. Even if gypsum formation is not prevalent, use of sodium bicarbonate may still improve rinsing efficiency through acid neutralization. To assess improvements in rinsing efficiency, a plastic “pipe reactor” is being designed to enable a series of tests.

4) Use of pre-treatment compounds to reduce copper cation exchange. The Magma/BHP laboratory postulated that aluminum sulfate, $Al_2(SO_4)_3$, could counteract the tendency for dissolved copper to be exchanged onto active sites on the surfaces of clay particles. Mineralogical characterization of core box residues has revealed copper associated with kaolinite, an occurrence not found in unleached core. Aluminum sulfate is already present in the PLS due to decomposition of potassium aluminum sulfate, *orthoclase*, but tests are being considered that would compare copper extractions in the presence of varying concentrations of aluminum sulfate.

5) Establishing the correlation relationship between recovery demonstrated in core box metallurgical tests with that seen the PTF. It will be essential to demonstrate how the performance of the PTF well field correlates with core box copper extractions to forecast recovery in similar areas during commercial operations. Supplementary core box tests are being considered that would be conducted on core from the mineralized zones that will be leached during the PTF program.

6) Some of this work is underway and all recommended work can be completed within 6 months.

14 MINERAL RESOURCE ESTIMATES

SRK has estimated Canadian Institute of Mining, Metallurgy, and Petroleum (CIM)-compliant mineral resources sufficient to meet National Instrument (NI) 43-101 requirements (CSA, 2011). SRK previously reviewed in detail the historic resource estimation methodology, updated the estimation methodology, and developed criteria for assigning classification of Measured, Indicated, and Inferred resources, in line with current industry standards (SRK, 2010). The Mineral Resource Statement was revised slightly in 2011 to incorporate changes made in the production plan (see Section 14.9).

SRK used Maptek Vulcan software for wireframe reconstruction, compositing, statistics, and block modeling as described below. The mineral resource estimation was prepared by Mr. Russell White, SME RM, SRK resource geologist with 26 years of experience. Mr. White has no affiliation with Curis Resources Ltd. or Curis Resources (Arizona) Inc. and is independent of the issuer per qualifying tests in Title 1.5 of NI43-101 (CSA, 2011).

14.1 DRILL HOLE DATABASE

The drill hole database used for the 2010 SRK resource estimate included 502 drill holes within the model area. The data were originally compiled by BHP in 1998 (Table 10-3). Of these drill holes, 445 holes were logged and 380 were assayed for total copper (TCu). These 445 drill holes represent 328,851 feet of sampled drilling, with 61,531 sampled intervals. The majority of the TCu assays (58.3%) are from the sulfide zone reflecting the thickness of this zone and the focus of previous exploration efforts. 37% of the TCu assays are within the oxide zone and a minor component (4.7%) were assayed in the basin-fill formations. Relative to the total number of assayed intervals, 48% have been assayed for acid soluble copper (ASCu) and 63% of the 29,969 ASCu assays are within the oxide zone. Within the oxide zone, 83.2% of the TCu assays have corresponding ASCu analyses as shown in Table 14-1. A number of drill holes were logged but were not assayed including monitoring and water production wells and some historic condemnation and assessment holes.

Table 14-1: Summary of Assayed Intervals in Model Area as of February 2010

Category	Number of TCu Assays	Footage Assayed for TCu	Number of ASCu Assays	Footage Assayed for ASCu
Basin-Fill	2,886	19,796	403	3,090
Oxide/Mixed	22,765	128,797	18,935	109,077
Sulfide	36,880	180,257	10,631	54,561
Total	61,531	328,851	29,969	166,727

Source: Compiled by SRK, 2010 from data available in the 1998 BHP drill hole database.

In addition to the TCu and ASCu assays, the database contains numerous fields for geologic codes, which were used for creating the geologic model described in Section 14.2. The codes most relevant to the resource estimate are the metallurgical zone (METZO), as defined in Table 14-2, and the copper oxide abundance codes (CUOX1 and CUOX2).

Table 14-2: Drill Hole Database Fields and Weight Percentages Assigned to CuOX Codes

Record	Field	Description
COLLAR	HOLE#	Hole ID
	EAST	X-coordinate (ft)
	NORTH	Y- coordinate (ft)
	ELEV	Z- coordinate (ft amsl)
	DEPTH	Hole depth (ft)
SURVEY	HOLE#	Hole ID
	FROM	Survey Depth (ft)
	AZ	Hole Azimuth (degrees)
	DIP	Hole Inclination (degrees of dip from vertical)
ASSAY	HOLE#	Hole ID
	FROM	Interval Start Footage
	TO	Interval End Footage
	ROCK	Rock Code see below
	TCU	Total Copper Assay (%)
	TCUCAP	Capped Copper Assay (%)
	ASCU	Acid Soluble Copper (%)
	ASCUFX	Adjusted Acid Soluble Copper (%)
	FRACI	Fracture Intensity
	FRACD	Fracture Density
	FTDIP	Fracture/ Fault Dip (dip relative to core axis)
	REC%	Core Recovery
	RQD	Rock Quality Designation
	METZO	Metallurgical Zone Code
	CUOX1*	Copper Oxide 1 (Fracture Hosted, 1-7)
	CUOX2*	Copper Oxide 2 (Clay hosted, 1-7)
	MOS2	Molybdenum Assay
	CODE	Surface Code
	SMZ	Simplified Metallurgical Zone 1=CuOx,2=FeOx,3=Sulfide

*Source: Compiled by SRK, 2010. *Notes: See sub-table below for details on CUOX1 and CUOX2 codes.*

Copper Oxide Codes (CUOX1, CUOX2 Mineral Weight %)	
1 =	< 1%
2 =	1-2%
3 =	2-5%
4 =	5-10%
5 =	10-20%
6 =	20-50%
7 =	>50%

Fields in the databases that were derived from other data are Simplified Metallurgical Zone (SMZ), Capped Copper Assay (TCUCAP), and Adjusted Acid Soluble Copper (ASCUFX). The SMZ designation was assigned based on the value of the METZO code and the CUOX codes, as shown in Table 14-3.

Table 14-3: Relationship of Metallurgical Zone (METZO) Codes and SMZ Codes

Metallurgical Zones	METZO	SMZ
Basin-fill	0	0
Copper-oxide dominant	1	1
Mixed copper/iron oxide	2	1
High-iron oxide	3	2
Transition with copper oxide	4	1
Transition w/o Copper Oxide	4	2
Sulfide	5	3

TCUCAP was applied as high-grade capped values based on the SMZ code as follows:

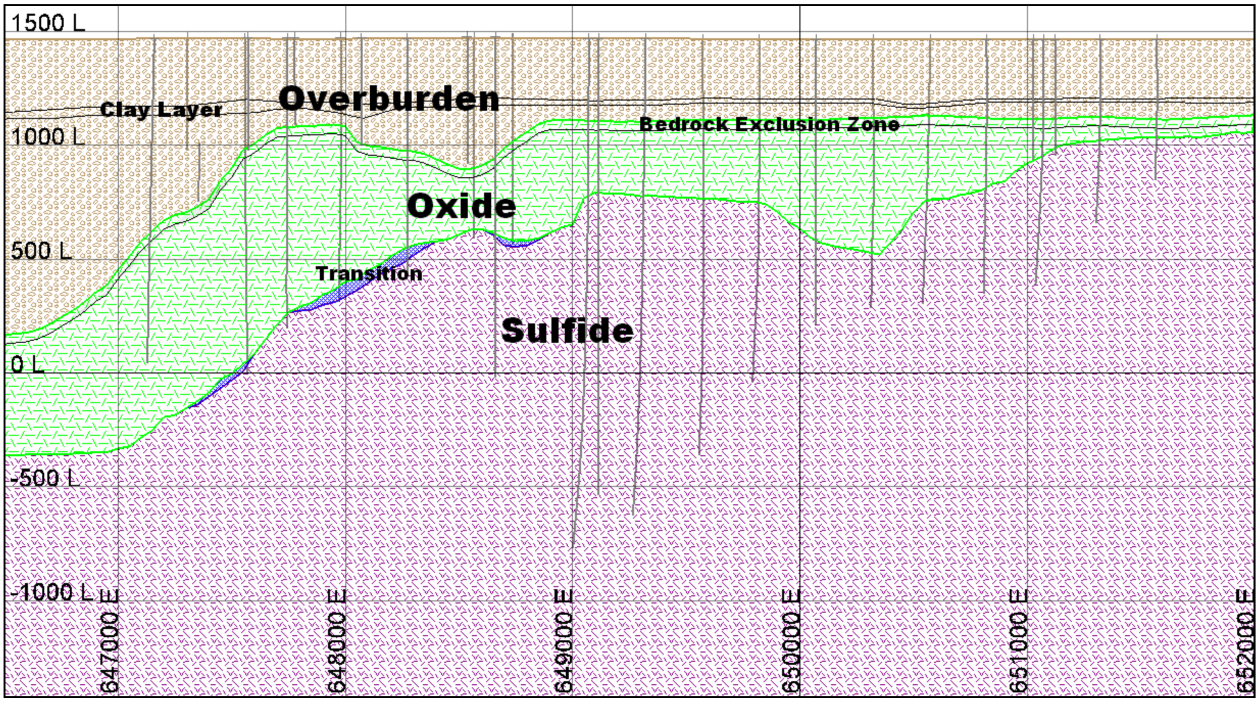
- SMZ=1: TCu was capped at 2.7%,
- SMZ=2: TCu was capped at 1.2%, and
- SMZ=3: TCu was capped at 2.0%.

This is based on the break in populations as shown in the probability plots shown in Section 14.4.

ASCUFX is a derived acid soluble copper grade for those grades that were missing or unreasonably high. It is important to address the missing ASCu values so that the TCu and ASCu estimates are done in a similar fashion. Differential sample distribution of the two sample types could lead to estimates of ASCu that are higher than the TCu estimates. Any ASCu assay more than 95% of the corresponding TCu grade was capped at 95% of the total copper grade. Any missing sample in the ASCu field was derived from the TCu values using the factors described in Section 14.4.

14.2 GEOLOGY

Wireframe grid surfaces were generated from the cross sectional surface digitized lines for use in coding and sub-blocking the 3D block model. The most relevant surfaces represent topography, top of bedrock, bottom of the oxide zone, and top of the sulfide zone as shown in Figure 14-1. Other surfaces representing top of basin-fill conglomerate units and the inter-conglomerate clay layer were also created, but were inconsequential to the resource model.



Prepared by SRK, 2010. Drill holes are shown with downhole deviations. Overburden is the basin-fill formations overlying the oxide and sulfide zones. The Bedrock Exclusion Zone is the area within top 40' of bedrock in which solid (not slotted) well casing will be installed.

Figure 14-1: EW Section 745700N Looking North Showing Subsurface Boundaries Relevant to Resource Estimation

Grades were only estimated in rock codes designated as bedrock. The "base of oxide" and "top of sulfide" surfaces coincide in most areas, although in a few areas there is a minor gap between them that represents a transition zone of overlapping oxide and sulfide minerals. For the purposes of this estimation, the transition zone is included with the oxide zone because some copper recovery is possible from this small volume of rock.

14.2.1 Hydrogeology

As part of the Aquifer Protection Permit (APP) application process, Brown and Caldwell ("BC") conducted an extensive site characterization program in 1995. The site characterization program was designed to assess baseline water quality, water levels, vertical communication of the water bearing units, and hydraulic head distribution within the project area as well as in the area upgradient and downgradient to the project site. In a preliminary review of area-wide groundwater quality for the APP application, BC (1996a) compiled the existing groundwater geochemistry data. The data covered a 100-square mile area in the region and spanned a 52-year period. The data were from wells of various depths and completions that were drilled for a variety of uses. BC statistically evaluated the concentrations of sodium, sulfate, total dissolved solids, and nitrate found in the existing wells. The data showed that approximately 70 nitrate values and 3 cadmium values exceeded State of Arizona Aquifer Water Quality Standards ("AWQS"); the nitrate exceedances were attributed to impacts related to agricultural activities in the Florence basin.

To characterize the local groundwater quality, water samples were taken from 5 irrigation wells, irrigation water in the San Carlos Irrigation and Drainage District (SCIDD) North Side Canal, and the abandoned air shaft connected to the underground workings. In addition, BC drilled, completed, and developed 23 new monitor wells, 17 observation wells, and 17 pumping wells in 1995 using standard industry practices. The wells were constructed in clusters of 2 to 4 wells and screened at various depths to monitor water quality and the hydraulic properties in the different units (upper and lower basin-fill, oxide bedrock, sulfide bedrock). Twelve months of baseline groundwater samples were collected from 31 point-of-compliance (POC) monitoring wells using standard industry sampling methods and analyzed by a laboratory certified in Arizona to perform environmental water quality analyses. The parameters monitored include inorganic common ions, inorganic trace metals, and radiochemicals. Volatile and semi-volatile organics, polychlorinated biphenyls, pesticides, total petroleum hydrocarbons, sulfur isotope ratios, and tritium isotope values were also analyzed on selected sampling events. An average concentration for each APP-regulated and underground injection control (UIC) regulated constituent was calculated to develop site-specific compliance limits. These data and calculations were submitted for review to the ADEQ and the United States Environmental Protection Agency (USEPA) on August 28, 1997, as part of the APP and UIC permit applications.

ADEQ concluded the baseline water quality data were sufficient to calculate site-specific Aquifer Quality Limits (AQLs) and Alert Levels (ALs) for compliance monitoring. The AQLs and ALs are established in the APP and reflect the water quality concentrations documented before the initiation of leaching and recovery operations. Water quality compliance monitoring and reporting has continued on a quarterly basis since 1997. Self-monitoring report forms have been submitted to ADEQ on the frequency specified in the APP. Curis reinitiated water quality compliance sampling and reporting to ADEQ after a lapse of approximately one year in sampling and reporting by the previous owner Florence Copper Inc.

With one exception, no exceedance of an AL or an AQL has been verified since compliance monitoring began in 1997. Two samples collected from Well P49-O in December 2011 and January 2012 exceeded the ALs for magnesium, sulfate, and total dissolved solids (TDS). Those samples were collected using a different sampling methodology than all previous samples collected from Well P49-O. ALs were not exceeded in any of the samples collected from that well between 1997 and December 2011. In addition, magnesium, sulfate, and TDS were not detected above the ALs in subsequent samples collected from Well P49-O in 2012 using the original sampling protocol. Therefore, BC (March 2012) concluded that the abrupt change in concentrations detected in the well in December 2011 and January 2012 were the result of the change in the sampling protocol and were not related to any activities conducted at the site.

Occasional exceedances of the AWQS for nitrate of 10 milligram per liter have also been detected at the project site. However, ADEQ did not establish an AL or an AQL for nitrate because of regionally elevated levels of nitrate in the groundwater and because nitrates are not used or generated in the in-situ leaching (ISL) process.

Groundwater chemistry associated with the Upper Basin Fill Unit (UBFU), Lower Basin Fill Unit (LBFU), oxide bedrock, and sulfide bedrock show distinct compositional variations. The variation in water quality suggests limited vertical communication between the water bearing units in the hydrogeologic system (BC, 1996a). In general, higher concentrations of bicarbonate, sulfate, nitrate, chloride, and total dissolved solids (TDS) are detected in the UBFU than in the groundwater in the LBFU and underlying bedrock. With the exception of iron, strontium, aluminum, and manganese, the majority of trace metals are below detection or their respective AWQS in the UBFU. Elevated iron and aluminum concentrations above detection are measured in the LBFU, and nitrate exceeds the AWQS in both basin-fill units. No regulated organic constituents or radiochemicals were detected above their respective AWQS in basin-fill units. The oxide bedrock zone shows elevated fluoride with respect to the basin-fill units. Iron and sulfate are substantially concentrated in the sulfide bedrock unit.

The following ranges in concentrations for indicator parameters have been measured in the UBFU based on a population of 268 samples though September 2011:

- Sulfate: 130 to 400 milligrams per liter (mg/L),
- Nitrate: 4.9 to 19.6 mg/L (96 samples),
- Fluoride: 0.42 to 1.0 mg/L, and
- TDS: 610 to 3,200 mg/L.

The following ranges in concentrations for indicator parameters have been measured in the LBFU based on a population of 551 samples through September 2011:

- Sulfate: 31 to 250 mg/L,
- Nitrate: 0.3 to 12.2 mg/L (176 samples),
- Fluoride: <0.4 to 1.4 mg/L, and
- TDS: 412 to 1,500 mg/L.

The following ranges in concentrations for indicator parameters have been measured in the oxide unit based on a population of 730 samples through September 2011:

- Sulfate: 5.8 to 230 mg/L (excluding M24-O, which ranges from 630 to 1,000 mg/L),
- Nitrate: <0.1 to 8.1 mg/L (238 samples),
- Fluoride: <0.4 to 2.8 mg/L, and
- TDS: 200 to 710 mg/L.

The following ranges in concentrations for indicator parameters have been measured in the sulfide unit based on a population of 45 samples through September 2011:

- Sulfate: 89 to 2,200 mg/L,
- Nitrate: <0.1 to 0.1 mg/L (45 samples),
- Fluoride: 0.16 to 4.8 mg/L, and
- TDS: 380 to 3,400 mg/L.

14.3 DRILL HOLE COMPOSITES

Composites were created as 25-foot "Bench" composites, which are half the block height. This allows for greater resolution when estimating the fractional components of each block (Oxide, Sulfide, etc.)

Fields composited by using averages include TCU, TCUCAP, ASCUFX, CUOX1, CUOX2, and MOS2. Any field which had missing samples (represented by a -1) excluded the missing portion from the average. If the entire composite were missing, a default of -1 was stored to represent the missing sample. Due to the pervasive nature of the mineralization, this averaging method was deemed appropriate. Several water wells and other un-sampled technical drill holes are represented as un-sampled holes; if they were treated as zero grade, they would unduly lower the estimated grade of the deposit.

Fields that were composited by majority code include ROCK, METZO, MIN1, CODE, and SMZ.

Fields INDOX, INDFE, and INDSU were then calculated based on the METZO and CUOX codes as described in Section 14.1.

14.4 STATISTICAL ANALYSIS

Histograms and probability plots were produced for raw assays in three categories – Cu-Oxide, Fe-rich Oxide, and Sulfide as described in the 2010 PEA (SRK, 2010). From these plots and visual inspection of the high-grade distribution, the capping scheme described in Section 14.1 was derived. The mean grade and capping value for each metallurgical sub-category are shown in Table 14-4.

Table 14-4: Mean %TCu Grades and Capping Scheme

Category	Count	Grade	Variance	Max	Cap (%TCu)
All	**58,604**	**0.275**	**0.070**	**8.84**	**2.0**
Oxide	14,128	0.404	0.104	5.05	2.7
Fe-Rich	8,699	0.120	0.034	8.84	1.2
Sulfide	35,777	0.262	0.053	5.54	2.0

Source: Compiled by SRK, 2010

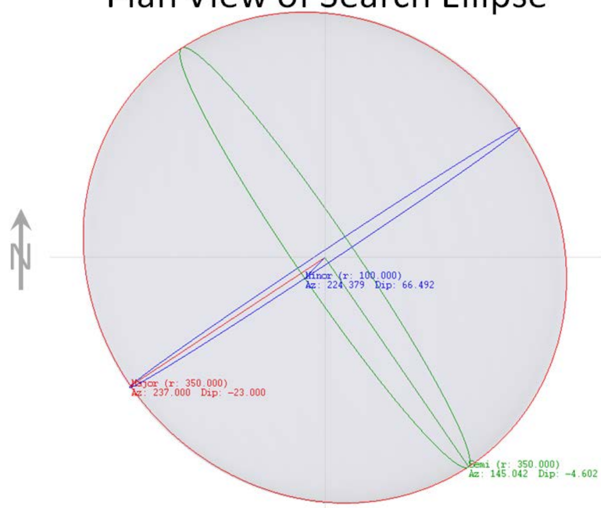
To determine the relationship of TCu grades to ASCu grades, measured ASCu assays were compared to assess the relationship to their corresponding TCu assays. Q-Q plots were generated to compare the populations, as shown in the PEA (SRK, 2010). For the Oxide population, which is of most interest, the ASCu grade is roughly 68% of the TCu grade. This relationship varies between 58 to 72% depending on the grade range, but 68% fits the curve well enough to be used as a simple average. For the Fe-rich oxidized zone, the ASCu Assays are roughly 60% of the

TCu. For the Sulfides, the ASCu assays are roughly 18% of the TCu assays; this ASCu component is not considered practical to extract by ISCR methods.

14.5 VARIOGRAM ANALYSIS

Semi-variograms on 25-foot composite copper values less than 2.0% TCu yield clearly defined spherical variogram structures. The Vulcan autofit algorithm produced a reasonable fit, which was manually adjusted to fit the best variograms. The resulting parameters and primary search ellipse are shown in Figure 14-2. Variogram examples were previously presented in the 2010 PEA. Variograms on met-codes indicators were not performed, as these indicators are generally consistent (with no variation) within the boundaries already defined.

Plan View of Search Ellipse



Search/Variogram Parameters

Parameter	Search	St1	St2
Xrot	237		
Yrot	5		
Zrot	-23		
Nug./SillDif	0.004	0.022	0.012
Major	350	512	700
Semi	350	126	500
Minor	100	105	350

Figure 14-2: Parameters and Primary Search Ellipse

14.6 BLOCK MODEL DESCRIPTION

The block model extends from 646,500E to 652,000E, and from 742,900N to 748,000N in Arizona Central State Plane coordinates (NAD27 in feet). The location of the block model is shown on Figure 14-3. The elevation ranges from 1,500 feet below sea level to 1,500 feet above sea level. Each block is 50 feet on a side (50-foot x 50-foot x 50-foot cube), but these blocks are sub-blocked on 25-foot x 25-foot x 25-foot intervals where necessary to fit lithology or metallurgical boundaries. Plan maps of block grades are shown on Figure 14-4 (700 feet above mean sea level [amsl]) and Figure 14-5 (1,000 feet amsl). Cross sections of block grades are shown on Figure 14-6 (east-west) and Figure 14-7 (north-south).

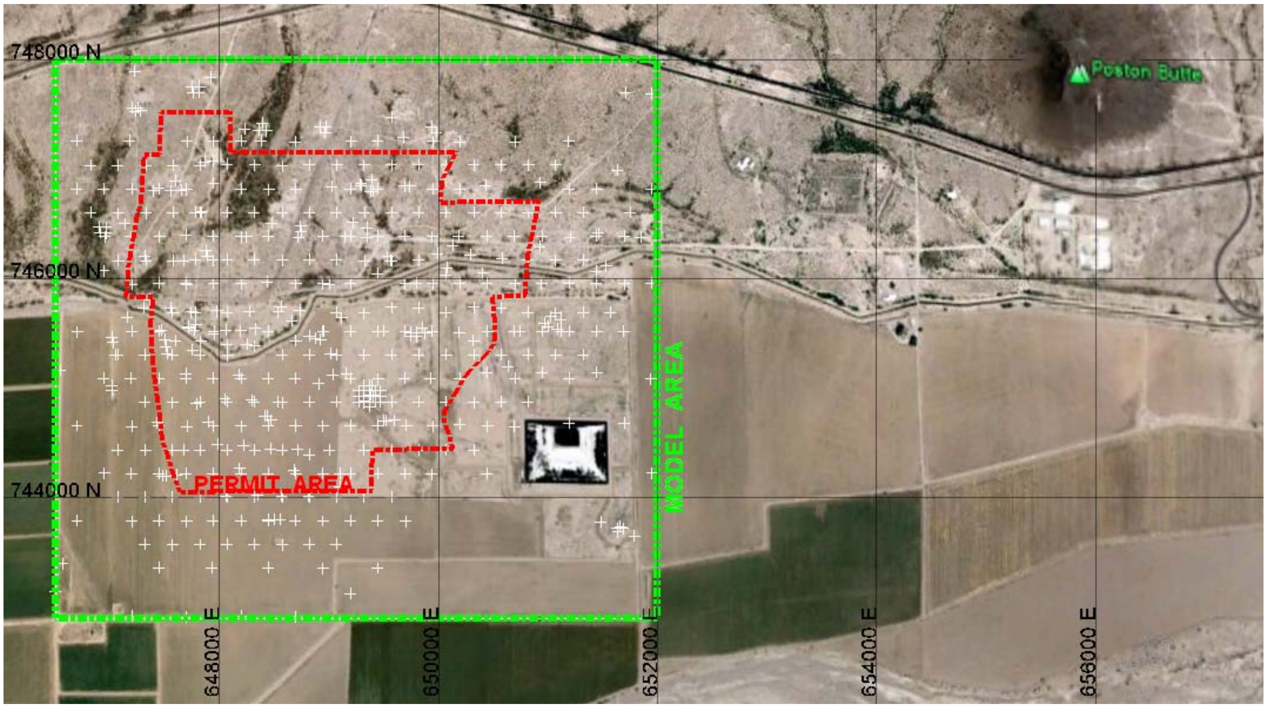


Figure 14-3: Location of Block Model (Green), Drill Data within the Block Model (White Crosses), and the Permit Area (Red)

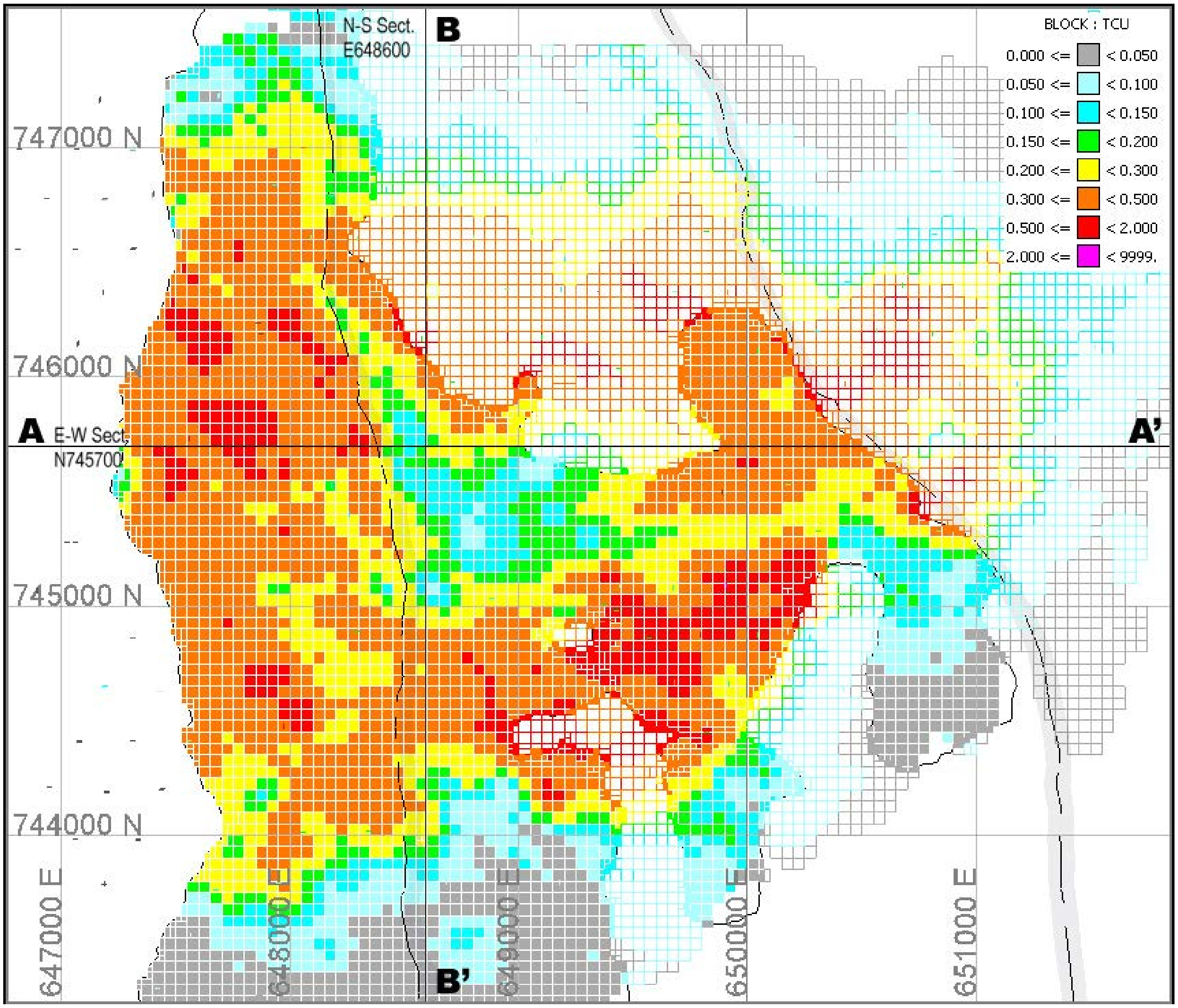


Figure 14-4: Plan Map (700 feet amsl) Showing Block Grades (Oxide/Fe-rich Blocks area solid bold shading; sulfides area light shading)

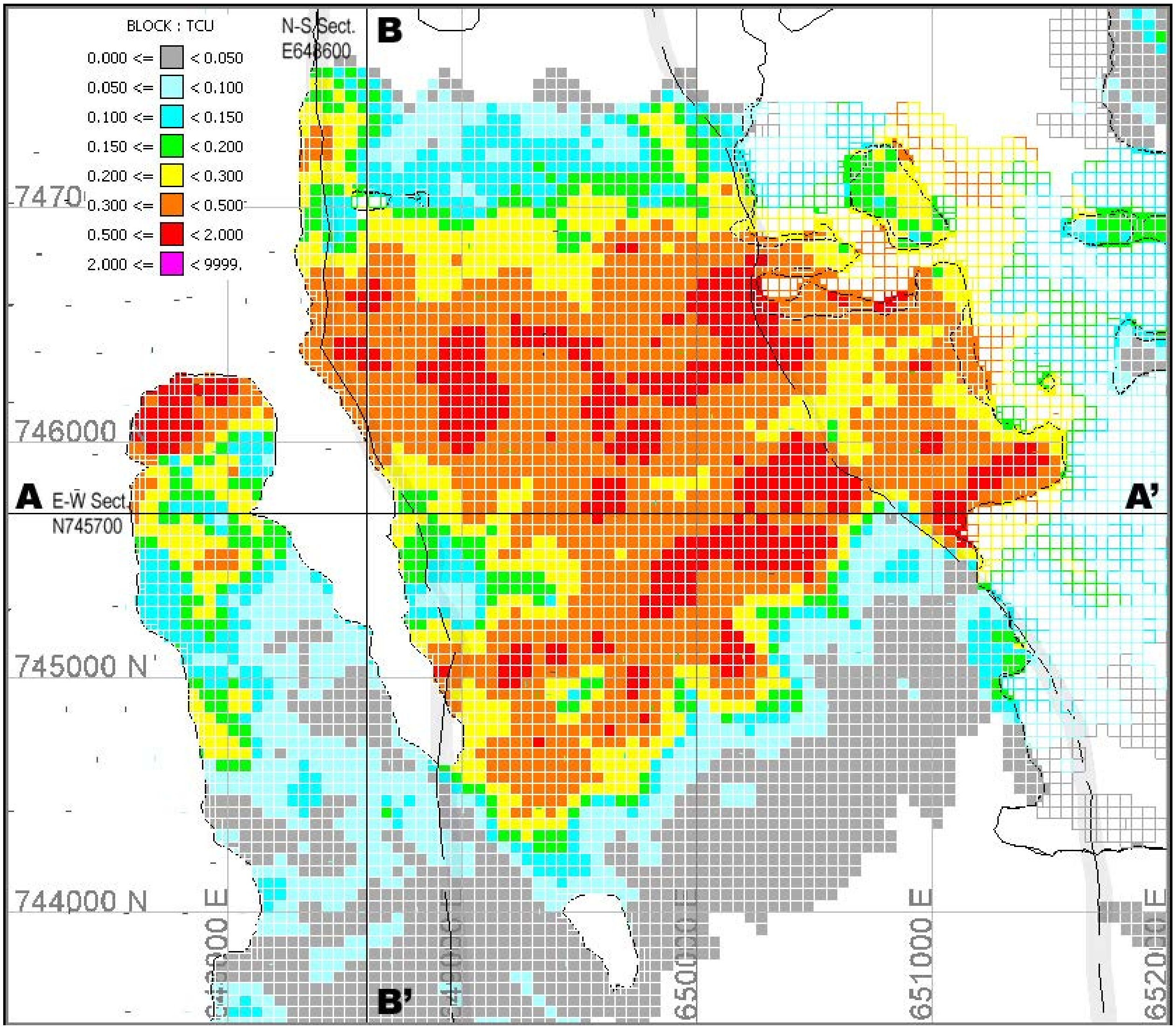
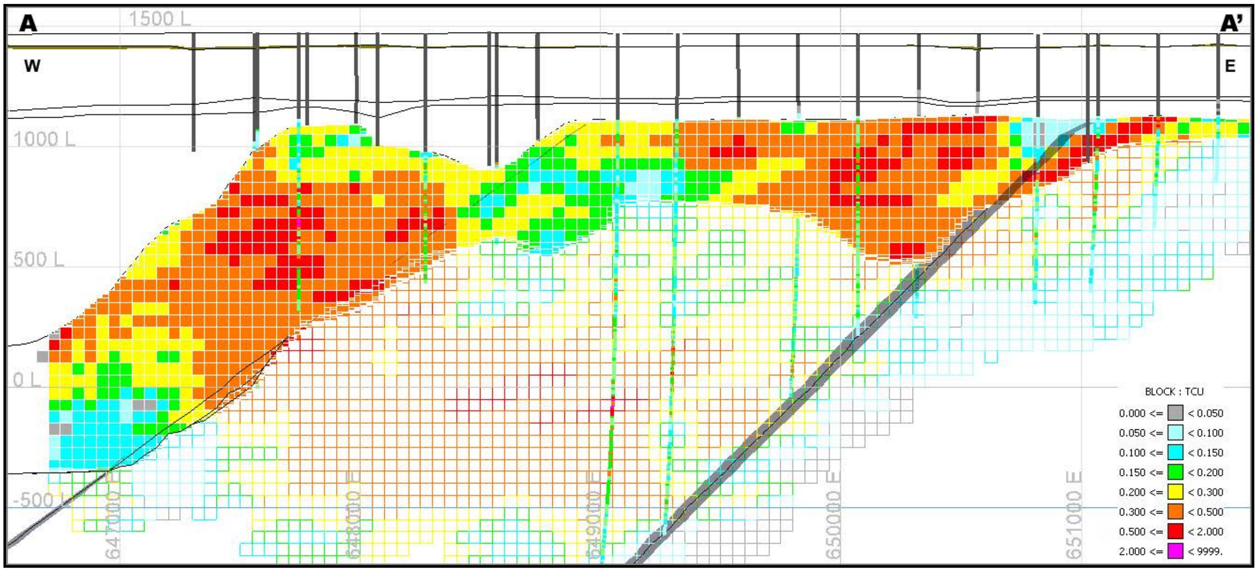


Figure 14-5: Plan Map (1,000 feet amsl) Showing Block Grades (Oxide/Fe-rich Blocks are solid bold shading; sulfides are light shading



Source: SRK Oxide/Fe-rich blocks are solid bold shading; sulfides are light shading). Party Line (east) and Sidewinder (west) faults are shown.

Figure 14-6: East-West Section N745700 Looking North Showing TCu Block Grades at a 0.05% TCu Cutoff

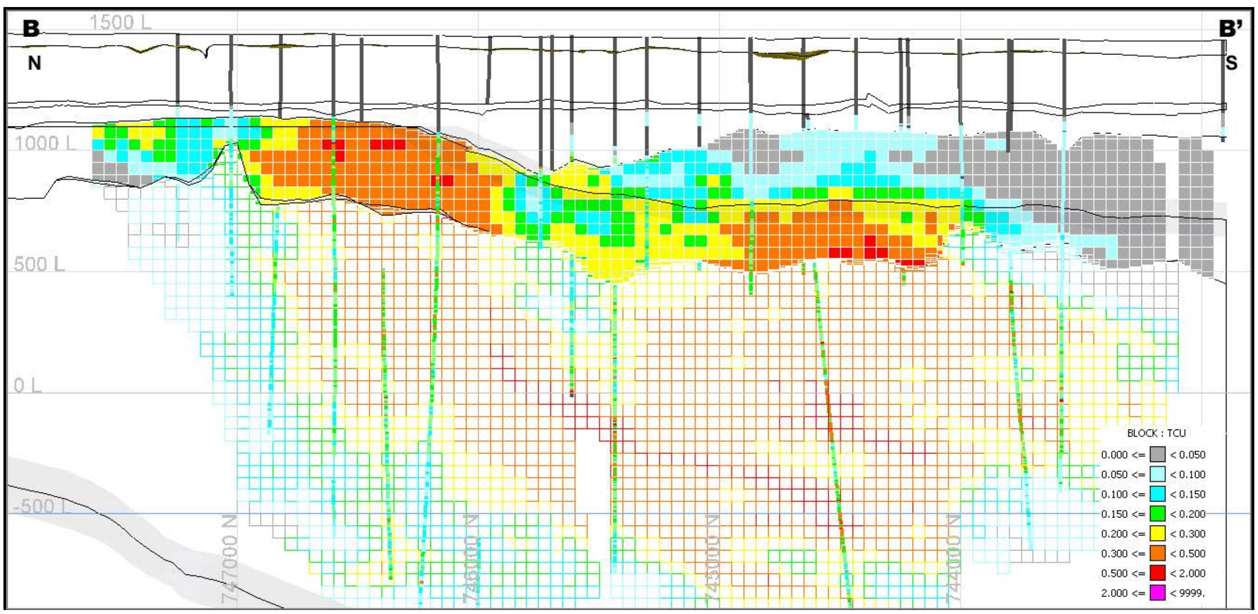


Figure 14-7: North –South Section E648600 Looking East Showing Block Grades (Oxide/Fe-rich Blocks are solid bold shading; sulfides are light shading)

14.6.1 Grade Estimation Methods

The primary estimation method used by SRK is similar to the Mineral-Indicator estimation method implemented historically by BHP. Index values were assigned to the composites for each of three mineral categories; Oxide, Iron (Fe)-rich, and Sulfide. Each composite received a "1" in the index if the met-code matched the mineral category; otherwise it received a "0". Percent indicator fields were then estimated from these composite indices using ordinary kriging.

The resulting block values are between 0 and 1, and represent a fraction of the block likely to contain that mineralization type. For example, if the PIOX field of a block is 0.6, it indicates that 60% of that block is likely to be Oxide. Three separate grades were then estimated for each block: one for the Oxide fraction, one for the Fe-rich fraction, and one for the Sulfide fraction. Next, the resulting grades are combined using the percent-indicator fields as weighting factors. The percent-indicator with the greatest value was determined and a "majority" code was assigned for each block. This allowed for a simplified "whole-block" summation of combined grades, categorized by majority block code.

In the case where the sum of the fractional components did not sum to 1.0 (either more or less than 100%), the percent indicators were "normalized" to keep the same ratios and their values were adjusted to equal 1.00. After normalization, each fraction could be reported separately, resulting in a more accurate assessment of the estimated tons and grade of each component.

Separate estimates were also done using unrestricted-ordinary-kriging, and a nearest-neighbor (pseudo-polygonal) estimate. The block model variables are listed in Table 14-5.

Table 14-5: Block Model Variables

Field	Description (*italic=integer value*, bold=floating point value)
tcuu	Total Copper Estimated by Ordinary Kriging regardless of met code (unrestricted)
tcuik	Total Copper Combined from fractions of tcuox, tcufe, and tcusu
tcunn	Total Copper Estimated from nearest composite (pseudo polyonal estimate)
tcuox	Total Copper Estimated by Ordinary Kriging from Oxide Composites Only
tcufe	Total Copper Estimated by Ordinary Kriging from FeRich Composites Only
tcusu	Total Copper Estimated by Ordinary Kriging from Sulfide Composites Only
ascuu	Acid Soluble Copper Estimated by Ordinary Kriging regardless of met code (unrestricted)
ascui	Acid Soluble Copper Combined from fractions of tcuox, tcufe and tcusu
ascnn	Acid Soluble Copper Estimated from nearest composite (pseudo polyonal estimate)
ascuo	Acid Soluble Copper Estimated by Ordinary Kriging from Oxide Composites Only
ascuf	Acid Soluble Copper Estimated by Ordinary Kriging from FeRich Composites Only*
piox	Proportion of block assumed to be Oxide
pife	Proportion of block assumed to be Fe-rich
pisu	Proportion of block assumed to be Sulfide
sumi	Sum of above 3 proportions
rock	Rock Type Code 921-922-923
distu	Average Distance of composites for unrestricted estimate
disto	Average Distance for Oxide only estimate
distf	Average Distance for Fe-rich only estimate
dists	Average Distance for Sulfide only estimate
distn	Average Distance for Nearest Neighbor estimate
compu	Number of Composites used to estimate block for Unrestricted estimate
compo	Number of Composites used to estimate block for Oxide Only estimate
compf	Number of Composites used to estimate block for Fe-rich only estimate
comps	Number of Composites used to estimate block for Sulfide only estimate
categ	Majority Met Type 1=Oxide 2=Fe-rich 3=Sulfide
class	Resource Class 1=Measured, 2=Indicated, 3=Inferred
flagu	Flag set when unrestricted estimate is made (1= first pass, 2=second pass)

Field	Description (*italic=integer value*, **bold=floating point value**)
flago	Flag set when oxide only estimate is made (1= first pass, 2=second pass)
flagf	Flag set when Fe-rich only estimate is made (1= first pass, 2=second pass)
flags	Flag set when sulfide only estimate is made (1= first pass, 2=second pass)
Source: Compiled by SRK, 2010	

14.7 MODEL VALIDATION

The block model was validated by visual inspection of numerous cross sections, comparing block grades to drill hole grades. Several blocks were inspected on an individual basis to ensure that the indicator normalization and grade combination scripts worked as expected. The block model fits the expected pattern of grade distribution, with no grades estimated above the bedrock surface and fault boundaries effectively acting as boundaries between low- and high-grade regions (see Figure 14-3 through Figure 14-7). The model was also compared to the previous block model, and although the SRK model did display more variability and less smoothing, the high-grade centers were in approximately the same areas.

14.8 RESOURCE CLASSIFICATION

The vast majority of the oxide mineralization within the permit area is drilled on approximately 250-foot centers, and the mineralization is remarkably consistent and predictable from hole to hole. The classification system shown in Table 14-6 was used to assign Measured, Indicated, and Inferred resources in the block model.

Table 14-6: Resource Classification Criteria

Resource Classification	Class Code	Criteria for Classification
Measured	1	Average distance to samples used is <200 feet *or* closest sample is less than 125 feet away *unless* the combined indicator grade is >0.150% TCu and the nearest neighbor is < 0.150% TCu (or vice versa), in which case the Class 2 (Indicated) is assigned to reflect the uncertainty in the grade estimate
Indicated	2	Average distance to samples used is <260 feet
Inferred	3	All other estimate blocks
Source: Compiled by SRK, 2010		

14.9 MINERAL RESOURCE STATEMENT

The current resource estimate is reported below within the model area and within historically defined boundaries for reference purposes. Resources reported below vary slightly from those reported in 2010 owing to the change in orientation of the resource reporting cells from an east-west orientation to a north-south diamond-shaped orientation. The change was made to match the north-south orientation of the copper production blocks.

Current resources are also reported for the portion of the mineralization that is contained within the Arizona State Mineral Lease land.

14.9.1 Current Resource Estimate

As previously reported in 2010, SRK is reporting current global mineral resources as shown in Table 14-7 at a 0.05% TCu cutoff grade. This includes all oxide including mineralization in the bedrock exclusion zone (BEZN). The BEZN is the top 40 feet of bedrock for which only partial copper extraction is anticipated due to geometries of anticipated fluid flow from injection/recovery wells.

Table 14-7: Florence Project Oxide Mineral Resources (SRK, 2011) – All Oxide in Bedrock (0.05% TCu cutoff)

Class	Tons	Grade	lb Cu
Measured	296,000,000	0.354	2,094,000,000
Indicated	134,000,000	0.279	745,000,000
M+I	**429,000,000**	**0.331**	**2,839,000,000**
Inferred	63,000,000	0.235	295,000,000
Note: All oxide includes the entire copper oxide zone and iron-oxide leached cap zone including the 40-foot bedrock exclusion zone. Contained metal values assume 100% metallurgical recoveries. The tonnage factor is 12.5 ft^3/ton.			

For an ISCR project, the actual mining cutoff grade is a complex determination that includes mineralized material zone thickness, depth to bedrock, the cost of acid, the leach recovery rate versus acid consumption, the PLS concentrate grade, cycle times, etc. The cutoff grade was determined in 2010 based on order-of-magnitude cost estimate updates from previous work and current copper prices. SRK believes that resources reported at a 0.05% TCu cutoff have a reasonable expectation of potential economic viability. SRK-reported resources are compliant with CIM resource classifications and are sufficient for NI 43-101 reporting.

14.9.2 Re-estimates of Historically Defined Zones

The following tabulations are sub-sets of the current resources stated in Table 14-7. The tabulations are also stated at the 0.05% TCu cutoff and present the Measured, Indicated, and Inferred resources within various relevant site boundary conditions including:

- All oxide below the bedrock exclusion zone (Table 14-8); and
- All oxide below the bedrock exclusion zone within the current well field boundary at 0.05% TCu cutoff (Table 14-9).

Table 14-8: Oxide Mineral Resources below Bedrock Exclusion Zone (SRK, 2011) – (0.05% TCu Cutoff)

Class	tons	Grade	lb Cu
Measured	273,000,000	0.359	1,962,000,000
Indicated	117,000,000	0.283	661,000,000
M+I	**390,000,000**	**0.336**	**2,622,000,000**
Inferred	55,000,000	0.240	264,000,000

Note: All oxide includes the copper oxide zone, and the iron-oxide leached cap zone. Bedrock Exclusion Zone is the top 40 feet of bedrock where blank casing is required. Contained metal values assume 100% metallurgical recoveries. The tonnage factor is 12.5 ft^3/ton.

Table 14-9: Oxide Mineral Resources below Bedrock Exclusion Zone within the Well Field Area (SRK, 2011) – (0.05% TCu Cutoff)

Extracted Copper Pounds	1,698,000,000
Extracted From Measured and Indicated Resources:	
Tons	339,953,000
TCu Grade (%)	0.358
Contained Copper lb	2,435,400,000
Average Recovery (%)	69.7
Inferred Resources (not included):	
Tons	11,184,000
TCu Grade (%)	0.377
Contained Copper lb	84,400,000

The resources are tabulated with reference to boundaries defined in the historical resource models. They have relevance to the Pre-Feasibility Study as extraction- and permit-related constraints to the current resource, and are reported here for the purpose of defining the potentially extractable resource under the current permits. The purpose for stating these tables here is to provide an assessment, under current permits, of the global oxide resource (Table 14-10) versus the potentially extractable resource.

Table 14-10: Global Oxide Mineral Resources at Various Cutoffs (SRK, 2010)

%TCu Cutoff	Tons Cu	%TCu Grade	lb TCu
0.05	429,487,000	0.331	2,841,200,000
0.10	380,406,000	0.364	2,769,200,000
0.15	343,363,000	0.390	2,677,400,000
0.20	313,496,000	0.410	2,572,700,000
0.25	281,072,000	0.432	2,426,500,000
0.30	245,849,000	0.454	2,232,100,000

Note: Oxide includes the copper oxide zone, and the iron-oxide leached cap zone. Contained metal values assume 100% metallurgical recoveries. The tonnage factor is 12.5 ft^3/ton.

Curis Arizona is currently considering the project only as an ISCR operation, and sulfide mineralization is not considered to have a reasonable potential to be extractable by ISCR. The bedrock exclusion zone and the permit boundaries are permit-related constraints that were placed on the deposit historically and may be modified with the required demonstrations to USEPA and ADEQ, so are presented for historical comparison purposes.

All oxide tons and grade are also reported at numerous cutoffs and plotted in a grade-tonnage curve, to demonstrate the grade distribution of the deposit and how the oxide resource varies depending on the cutoff used (Figure 14-8). The total oxide resource below the bedrock exclusion zone shown in Table 14-8 is the resource used as the basis for determining potentially extractable copper for the purpose of this Pre-Feasibility Study.

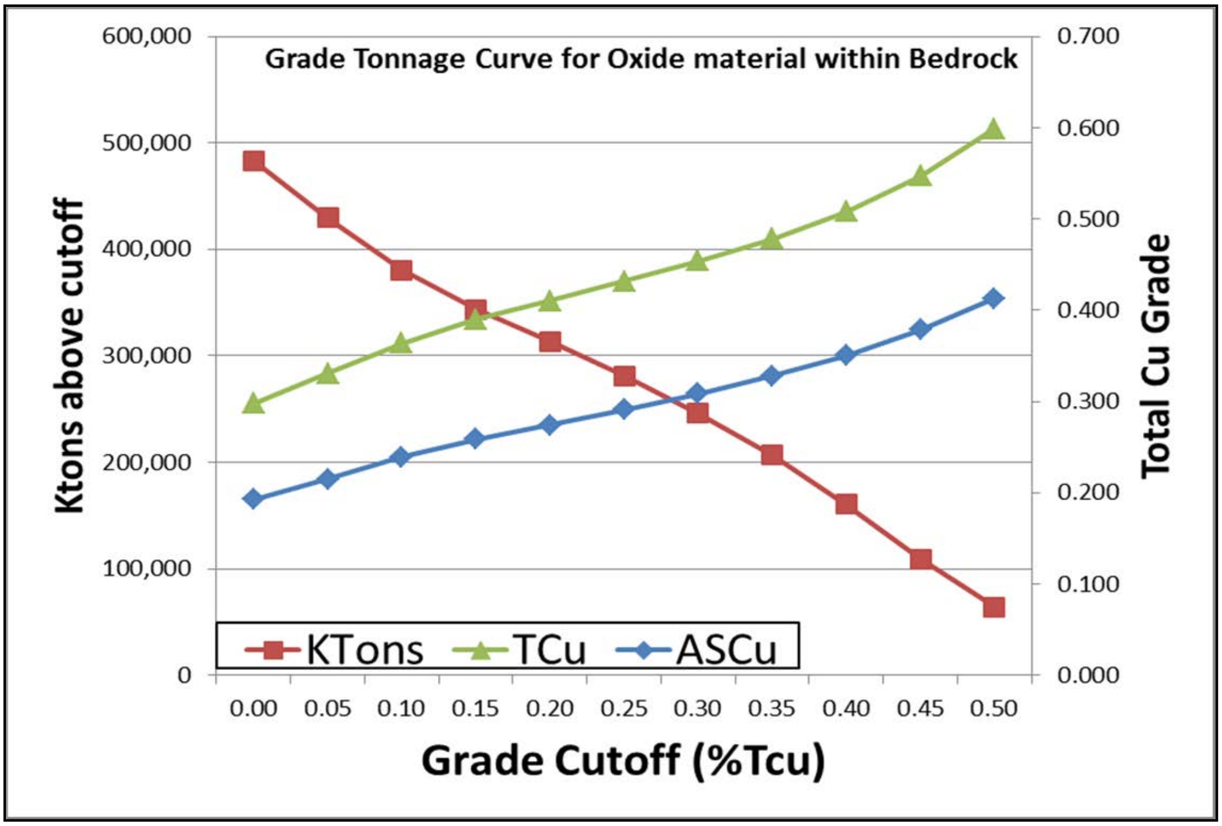


Figure 14-8: Grade-Tonnage Curve for all Oxide Zone Material within Bedrock

14.10 MINERAL RESOURCE SENSITIVITY

Separate grade estimates were performed using unrestricted-ordinary-kriging, and a nearest-neighbor (pseudo-polygonal) estimate. These estimation methods are compared to both the majority and the fractional reporting methods of the mineral-indicator estimate in Table 14-11. The grade distributions (amount of tons represented within various grade ranges) are graphically demonstrated for each method in Figure 14-9. Although the different estimation methods give slightly different results, this is to be expected. The nearest neighbor estimation has the least smearing of grade, while unrestricted ordinary kriging has the most. The fractional reporting allows higher-grade fractions to be reported without the diluting influence of combined block grades. Although the fractional resource has fewer tons at lower cutoffs, there are more tons at higher cutoffs reflecting less smearing in the fractional reports.

Table 14-11: Comparison of Estimation and Reporting Methods at Various %TCu Cutoff Increments

Cutoff	Proportional Fractions			Proportional Majority			Nearest Neighbor			Unrestricted Ord. Kriging		
%TCu	MTons	%TCu	Mlb Cu	MTons	%TCu	Mlb Cu	MTons	%TCu	Mlb Cu	MTons	%TCu	Mlb Cu
0.05	297.881	0.366	2,180.829	307.190	0.362	2,223.295	296.747	0.378	2,241.791	306,232	0.362	2,219.548
0.10	281.260	0.383	2,155.604	295.727	0.373	2,206.139	275.576	0.401	2,210.106	294,995	0.373	2,202.815
0.15	262.649	0.401	2,108.983	280.840	0.386	2,168.052	253.456	0.425	2,154.166	279,579	0.387	2,163.636
0.20	243.321	0.419	2,040.970	258.496	0.404	2,089.093	227.268	0.454	2,062.977	256,752	0.406	2,083.456
0.25	220.833	0.439	1,939.666	232.369	0.424	1,971.291	204.317	0.480	1,960.279	231,483	0.425	1,969.463
0.30	196.489	0.459	1,805.248	203.693	0.445	1,813.216	177.749	0.511	1,814.845	202,879	0.446	1,811.607
0.35	168.694	0.481	1,624.257	168.802	0.470	1,585.956	150.765	0.544	1,640.016	167,759	0.472	1,582.792
0.40	133.765	0.509	1,361.729	127.306	0.501	1,274.390	124.033	0.581	1,440.131	126,169	0.503	1,270.344
0.45	92.430	0.546	1,009.753	83.290	0.540	899.995	92.211	0.634	1,169.774	83,348	0.544	906.421
0.50	54.445	0.597	650.014	47.304	0.591	559.419	67.027	0.695	931.596	48,444	0.594	575.582

Source: Compiled by SRK, 2010 from data available in the 1998 BHP drill hole database.

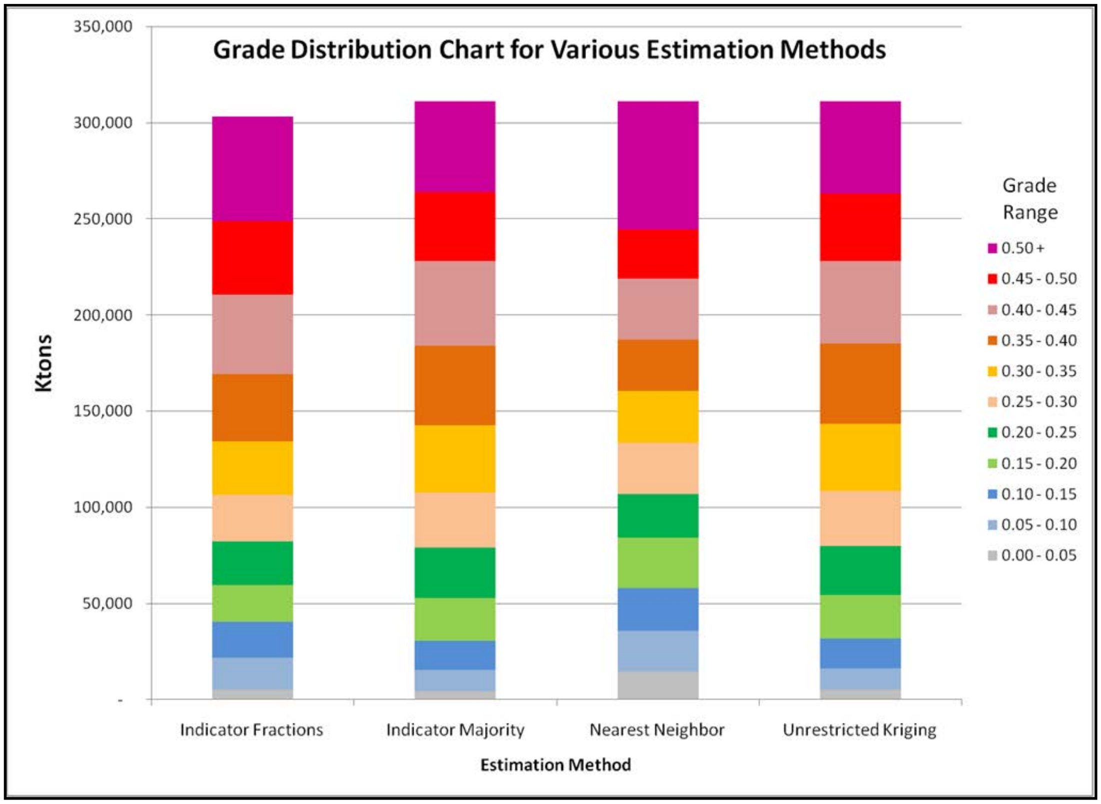


Figure 14-9: TCu Grade Distribution Chart for Various Estimation Methods

15 MINERAL RESERVE ESTIMATE

The resources identified by SRK were used to estimate recoverable reserves. The economic cutoff for reserves was taken from the 2010 SRK Preliminary Economic Assessment report. Based on the resources and economic cutoff, personnel from various companies (outlined below) created a model that identifies Probable recoverable reserves.

The reserve summary prepared for the FCP Pre-Feasibility Study was compiled using information from SRK, Terry McNulty (T.P. McNulty and Associates) and Curis Arizona personnel. The Probable reserve summary is based on the SRK resource model presented in Section 14. The mineral reserve estimate and copper extraction plan is based on in-situ mining technology, which involves the use of injection and recovery wells, and an SX/EW plant to recover the mobilized copper from the well field. An economic cutoff analysis was performed to define the edges of the resource area. The resource area was then modified to avoid the power line right-of-way (ROW) along the western edge of the deposit, to exclude any resource blocks north of the ASLD lease area and to avoid the infrastructure area located in the north east corner of the ASLD lease area. The Pre-Feasibility Study probable reserve is based upon the resource area outline shown in Figure 15-1 and an internal cutoff grade of 0.05% total copper. The resulting Probable reserve was utilized to produce the copper extraction plan.

The overall summary of the Probable reserve estimate as currently defined for the Curis FCP Pre-Feasibility Study is presented in Table 15-1. No Proven reserves are stated in this Pre-Feasibility report. The Probable reserve estimate includes resources categorized as Measured and Indicated for oxide material within the resource boundary. The Probable reserve estimate does not include Inferred resources within the resource boundary.

Table 15-1: Probable Reserve Estimate at 0.05% TCu Cutoff (February 2013)

Tons	339,953,000
TCu Grade (%)	0.358
Contained Copper lb	2,435,400,000
Average Recovery (%)	69.7
Extracted Copper Pounds	1,698,000,000
Notes: Reserves are stated within the economic resource boundary depicted in Figure 15-1. There are no Proven reserves. Measured and Indicated resources were converted to Probable reserves. Inferred resources were not assigned any value and were not converted to reserves.	

The copper extraction forecast for this study was developed on a nominal SX/EW average flow rate of 7,400 gallons per minute (gpm) for the first 5 years and ramping up to 11,000 gpm in year 6. The annual average production through year 5 is 55 million pounds of copper and ramps up to 85 million pounds in year 7. The current forecast provides the maximum SX/EW throughput rate for years 1 through 21, with a tapering decline in years 22 through 24.

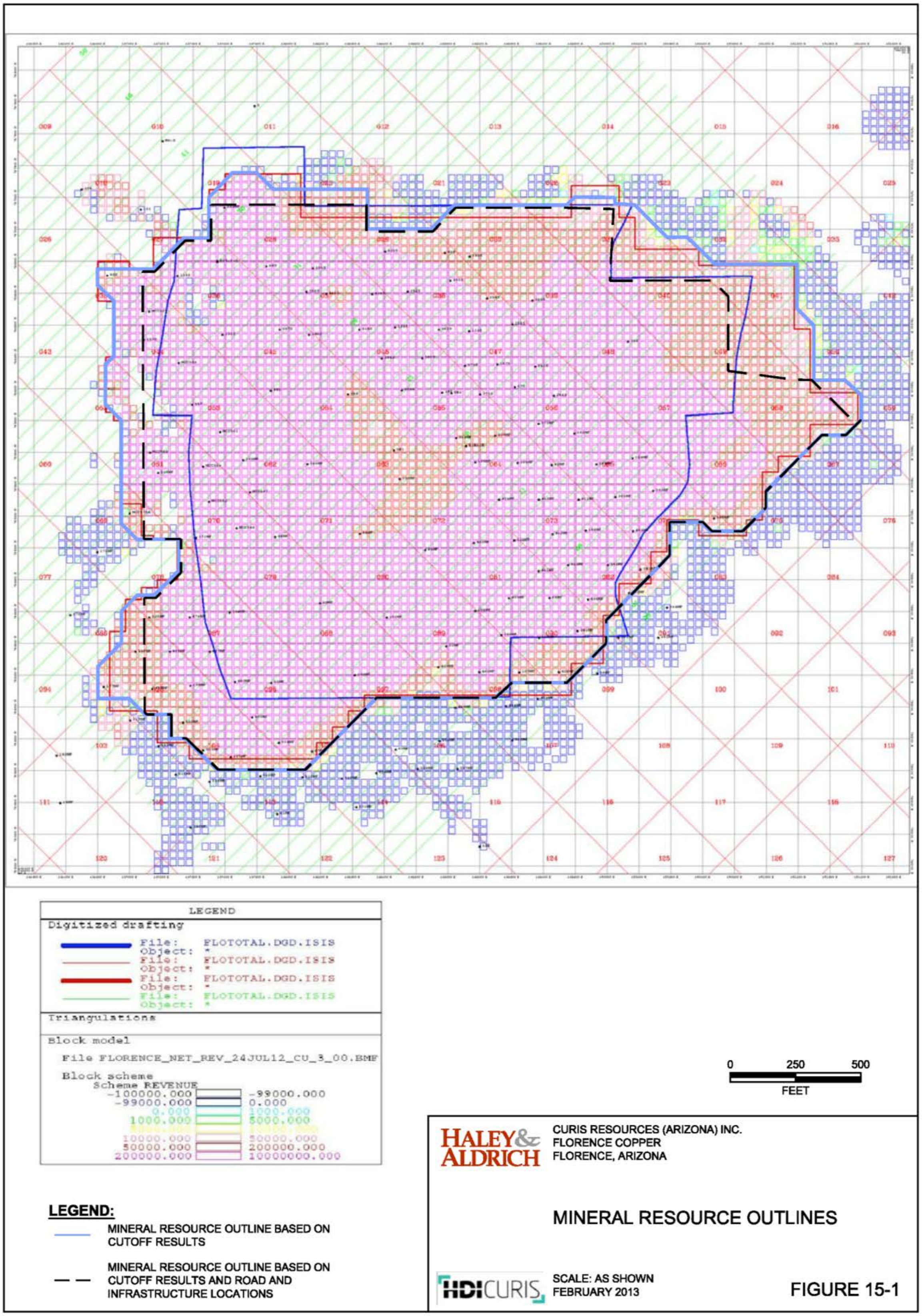


Figure 15-1: Mineral Resource Outlines

15.1.1 Economic Cutoff Strategy

The Curis FCP mining method is in-situ copper recovery (ISCR). This method recovers copper from undisturbed highly-fractured rock within the ground and therefore does not have traditional material handling and processing costs associated with moving and preparing the mineralized material for the process system. The ISCR method also has limited ability to do "selective mining" by isolating gangue intervals from mineralized material intervals within the resource area. The Curis FCP cutoff strategy was developed to evaluate the edges of the resource area similar to evaluating incremental pit-wall laybacks. The results of this analysis were used to establish an economic outer limit to the ISCR area.

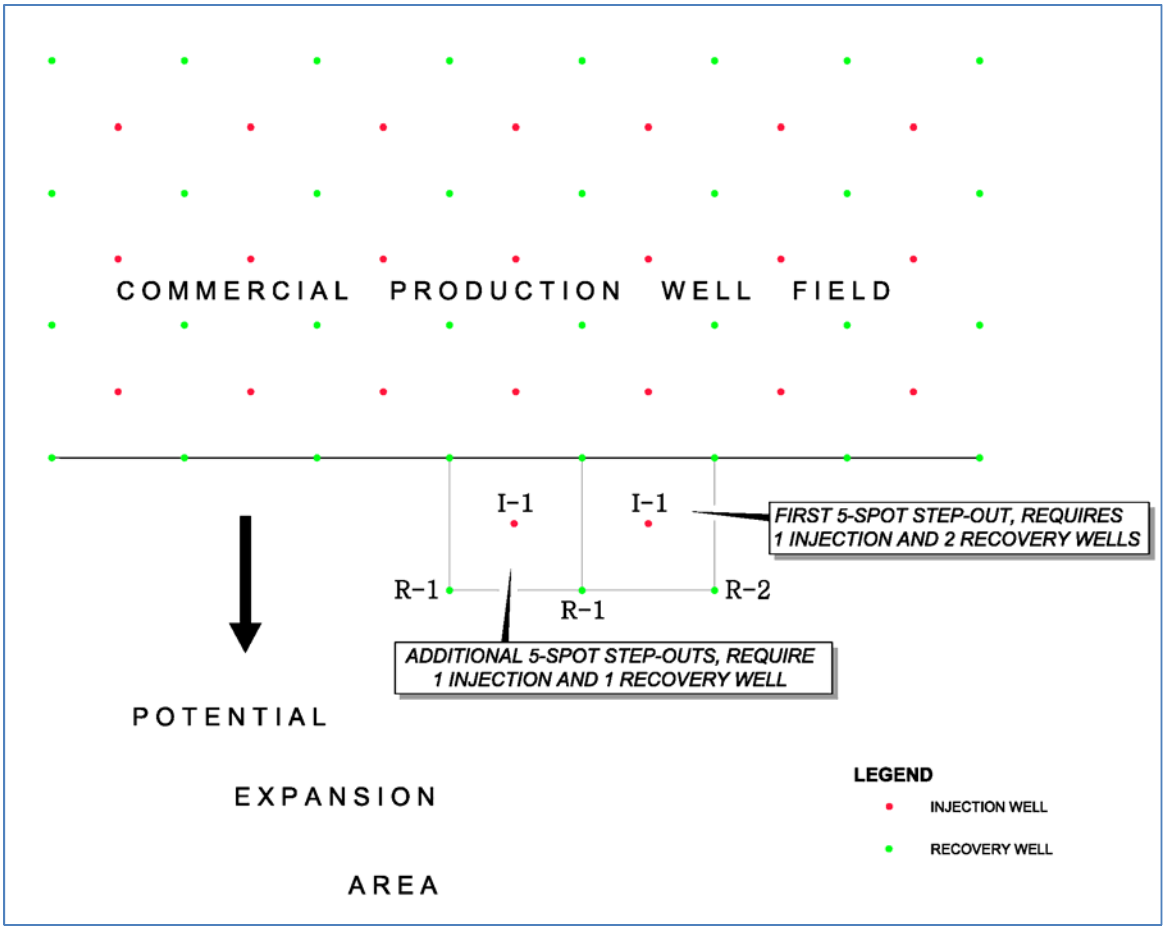
The basis for the cutoff evaluation was the SRK resource model (see Section 14) and the Preliminary Economic Assessment (PEA) economic model (SRK, 2010). The cutoff strategy used the following key assumptions to define the economic limit of the resource area:

- Only Measured and Indicated blocks were given economic value;
- A minimum of two 50-foot model blocks (vertical) were required for analysis (i.e., a minimum thickness of 100 feet);
- The smallest mining unit was defined as a single five-spot well arrangement (100-foot by 100-foot area, or four model blocks);
- Lateral evaluation of resource area was based on 50-foot block-model increments;
- Resource blocks must be contiguous to be considered for inclusion in the extraction area; and
- The PEA economic model was the basis for the fixed and variable costs.

The resource model prepared by SRK was used to evaluate the economic potential and define the outer limits of the ISCR area. The resource model consists of 50-foot by 50-foot by 50-foot blocks. Each block contains data interpreted into the block, including codes for measured and indicated, and inferred resources, tons, total copper grade in percent, rock type (oxide and sulfide), and several other parameters. The economic cutoff calculations used the measured and indicated coded resource model blocks, tons, total copper grade in percent, and rock type (oxide only).

Curis Arizona personnel set a minimum extraction thickness of 100 feet based on injection and recovery well installation economics. A manual review was conducted of each cross section through the model on 100-foot centers. The review of the cross sections provided guidance for the minimum thickness determination. Thinner, high grade intervals could have positive economics; however, the cross section review indicated this situation was very limited along the outer edges of the resource area.

The smallest mining unit was defined as a single five-spot well arrangement which consists of one injection well surrounded by four recovery wells. The spacing between recovery wells is 100 feet and the injection well is situated in the center of the 100-foot square, giving a distance of approximately 70 feet from injection to recovery well. For the cutoff analysis, it was rationalized that a minimum of one injection well and two recovery wells were needed to expand the outer edge of the resource area since the active edge of the resource area would already be lined with recovery wells. Once the first expansion five-spot is established, all other lateral expansion only required one injection well and one recovery well to complete a five-spot pattern. Therefore, the cutoff analysis was based on the costs associated with the incremental installation of one injection well and one recovery well. A typical incremental expansion is shown graphically on Figure 15-2.



(Source: Haley & Aldrich, November 2012)

Figure 15-2: Lateral Expansion Cutoff Strategy

The PEA economic model was the basis for the fixed and variable costs and copper recovery used in the cutoff evaluation. Specifically, fixed and variable well installation and closure costs, operating costs, and copper recovery factors were used. These cost descriptions and values are provided in Table 15-2.

Table 15-2: Cutoff Analysis Economic Parameters

Description	Value
Fixed Well Costs (common):	
Well Head	$2,000
Well field Mechanical	$9,070
Well field Electrical	$5,015
Core hole abandonment[1]	$515
Cultural mitigation[1]	$2,451
Fixed Well Costs (Injection):	
Downhole Injection Equip.	$26,726
Fixed Well Costs (Recovery):	
Down hole Recovery Equip.	$39,722
Well Variable Costs:	
Drilling and installation	$113/foot
Abandonment	$12/foot
Recovery	48.8%
Operating Cost	$0.68/copper pound
Copper Price	$2.50/copper pound

[1] The core hole abandonment and cultural mitigation costs were factored across the entire well field and applied as a per well average cost for the cut off analysis.

15.1.2 Example Cutoff Calculation

The following is an example calculation showing the break-even copper grade value for a 100-foot (two vertical blocks) column of mineralized material at a depth of 400 feet. The calculation is done for one five-spot or four blocks in plan view (100 feet by 100 feet) at an extraction interval depth of 400 to 500 feet below ground surface:

- Break Even Grade = Net Revenue of approximately $0;
- Net Revenue equals:
  - Copper Revenue (Recovered Copper Pounds[1] times $2.50 per pound);
  - Minus Operating costs ($0.68 per pound recovered copper);
  - Minus Fixed well costs ($104,550 for one injection and one recovery well);
  - Minus Variable well costs ($125,000: $113 times 500 feet plus $12 times 500 feet).

[1] Recovered copper pounds equals 100-foot by 100-foot by 100-foot divided by 12.5 cubic feet per ton, times 2,000 pounds per ton, times copper grade (%) divided by 100, times recovery (48.8%).

For a copper grade of 0.1615%, the net revenue is approximately $0. Therefore, for expansion of the deposit laterally, a minimum grade over a 100-foot column of mineralized material is 0.162% copper (this number is the break-even grade as calculated above using the recovery from the PEA).

15.1.3 Cutoff Evaluation in Resource Model

The cost factors and key assumptions were applied to the FCP block model. The results of the analysis are shown graphically in Figure 15-1. The economic outline is defined by the positive revenue blocks. This outline was then smoothed to eliminate single block step outs and small "peninsulas" that would not be feasible to develop. This economic outline was further modified to avoid the power line ROW along the western edge of the deposit, excluded any resource north of the ASLD Lease and excluded resource blocks beneath the infrastructure on the north east corner of the ASLD lease area.

15.1.4 Limitations/Opportunities

The economic evaluation of the resource will be updated after the planned field test verifies metallurgical recovery and other technical factors during PTF operations.

Environmental permits are in the process of being amended for project specific changes that have occurred since the original permits were issued in 1997. The basis for this Pre-Feasibility Study is the operating and closure requirements as stated in the original permits. Once the permits have been re-issued, any new permit requirements will be incorporated into the applicable sections of the feasibility study.

The Curis private property in the Town of Florence has been known to support mining operations or investigations for some forty years, although in recent years the Town of Florence has zoned it for a mix of residential, commercial and industrial uses. The Arizona State Land portion of the project is not subject to the Town's jurisdiction. Curis Arizona plans to initially develop the FCP on the Arizona State Trust Land and expand into the remaining portion of the resource following completion of copper extraction on the State Land. Approximately 58% of the Probable reserve estimate shown in Table 15-1 is outside the ASLD parcel.

Opportunities exist to increase the reserve by upgrading the classification of the Inferred mineralization within the resource boundary and by recognizing that the <0.05% copper will be leached during the ISCR operation. Inferred resources are listed in Table 15-3. The Inferred mineralization has the potential to add in excess of 50 million recoverable pounds of copper with little development cost since it is within the current boundary of the ISCR area. The <0.05% copper material has the potential to add additional recovered pounds.

Table 15-3: Inferred Resources at 0.05% TCu Cutoff Grade

Description	Value
Inferred Resources:	
Tons	11,184,000
TCu Grade (%)	0.377
Contained Copper lb	84,400,000
Inferred resources were not assigned any value and were not converted to reserves.	

16 MINING METHODS

16.1 IN-SITU COPPER RECOVERY

The mining method proposed for the FCP is the in-situ copper recovery (ISCR) method. This method was determined to be the most environmentally sound, economical and practical method for developing the FCP. Trade-off studies were conducted by Conoco, Magma and BHP that evaluated underground and open pit mining. In 1994, Magma determined that the best method of development for the FCP would be the ISCR method (Magma Pre-Feasibility Study, October 1994). This was confirmed by BHP in a subsequent Pre-Feasibility Study (BHP, 1997a).

In-situ recovery ("ISR") is an extraction method used for selected mineral deposit conditions as an alternative to open pit or underground mine methods and has been used in the mineral extraction industry for nearly 50 years. The mining equipment used for this method includes wells, pumps and pipelines used to inject, recover and convey process solutions. The well installation sequence and description of well equipment are given in sections 16.2.1 and 16.2.2. The ISCR process involves the installation of injection and recovery wells into the resource block. A weak low pH solution known as a lixiviant is injected into the mineralized formation. This low pH solution traverses through cracks and voids in the deposit, dissolving the copper mineralization. The copper laden solution, known as pregnant leach solution (PLS), is recovered in surrounding recovery wells where it is pumped to the surface for collection and processing in the SX/EW plant where copper is removed and produced as copper cathode. The barren solution (raffinate) is recirculated to the well field and injected into the deposit forming a closed loop system. The process is similar to heap leaching, where the mineralized material is contacted on the leach pad with a low pH solution (raffinate) to dissolve the copper, and the PLS is recovered and sent to an SX/EW plant.

With ISCR, hydraulic control is key to effective leaching and satisfying environmental permit conditions. The perimeter wells will be paired with observation wells to demonstrate that hydraulic control is maintained as required by the FCP environmental permits. FCP will continuously monitor hydraulic heads at, and gradients between, observation and perimeter wells surrounding the recovery and injection wells. An inward groundwater gradient will be created and maintained within the active ISCR area by constantly withdrawing more fluid than is injected.

In accordance with Arizona Revised Statute ("A.R.S.") 49-243.B.1, the proposed ISCR facilities are designed, and will be constructed and operated, to ensure the greatest degree of discharge reduction achievable through application of the Best Available Demonstrated Control Technology (BADCT) standards established by ADEQ. As implied by the name, BADCT is a standard that requires Arizona mine operators to always use a control technology that is proven to be effective in reducing discharges to the greatest degree possible, including, where practicable, technologies that permit no discharge of pollutants. Because technology is expected to improve over time, ADEQ periodically reviews and updates the BADCT standards to incorporate new and/or improved technologies that become available.

The significant benefit of ISCR methods over conventional mining methods is that there will be no physical material handling of the mineralized material, overburden, or non-mineralized rock. This method does not require blasting, loading, hauling, crushing, or screening of the mined rock. The environmental benefit is the ISCR method will not generate waste rock piles, heap leach piles, or tailings storage areas and will not leave an open pit or underground mine.

16.1.1 Hydrologic Characterization

Successful recovery of copper by the ISCR method requires favorable hydrologic conditions within and around the porphyry copper oxide mineralized material. Favorable hydrologic conditions facilitate dissemination of the lixiviant required to dissolve and extract the targeted acid-soluble copper oxide minerals. Favorable hydrologic conditions may include a saturated mineralized material body, abundant groundwater, and sufficient fracturing of the mineralized material body to facilitate efficient fluid movement and fluid-mineral contact. Hydrologic studies conducted at the FCP site by Curis Arizona and previous owners have demonstrated that the FCP mineralized material body and the overlying water bearing units have the necessary hydrologic characteristics to support copper production by ISCR methods. Characterization efforts, the water bearing units defined by those efforts, and their relationship to successful ISCR operations, are described below.

16.1.1.1 Hydrologic Studies

16.1.1.1.1 Conoco

From the time that development of the FCP mineralized material body was first conceptualized in the late 1960s, hydrologic properties of the oxide porphyry copper mineralized body have been vital to its eventual development. Conoco began hydrologic characterization of the mineralized material body in 1971 to determine the dewatering requirements for a planned underground mine and later, an open pit mine conceptualized at the FCP site. Hydrologic testing conducted by Conoco included several large scale pumping tests, one of which included pumping at an aggregate rate of 7,547 gallons per minute (gpm) for a period of more than six months while monitoring the hydraulic response of water levels in the Bedrock Oxide Unit (Conoco, 1976).

After completing detailed hydrologic studies and advancing an underground bulk sample, Conoco determined that intense fracturing and groundwater saturation of the mineralized material body created difficult mining conditions that rendered the development of an underground or open pit mine economically unfeasible. These findings led Conoco to first consider ISCR in 1980 (Conoco, 1980). Conoco came to understand that the very conditions that precluded economic underground or open pit mining at the FCP site created the favorable conditions required to produce copper by ISCR methods.

Although the hydrologic studies conducted by Conoco were not conducted for the purpose of demonstrating ISCR feasibility, their work yielded several important conclusions that address the hydrologic conditions required for successful ISCR. Key Conoco findings included hydraulic characterization of each of the water bearing units at the FCP site, and the hydraulic relationships between each of those units.

16.1.1.1.2 Magma

Shortly after purchasing the FCP property from Conoco in 1992, Magma initiated a Pre-Feasibility Study that included a re-evaluation of the potential for copper production by open pit mining or ISCR methods. The study included a review of hydrologic characteristics of the FCP mineralized material body, and concluded that ISCR is the most cost effective means of producing copper at the FCP site.

After completion of the study, Magma initiated an intensive hydrologic characterization program that included a series of 49 pumping tests conducted at 17 well locations distributed across the FCP site. The tests, conducted by BC, included 17 pumping wells and 46 monitoring wells screened within the various water bearing units. Eight wells were completed within the upper basin-fill unit (UBFU), 17 within the lower basin-fill unit (LBFU), 38 wells within the Bedrock Oxide Unit including the hanging wall and footwall zones of the major faults, and 3 wells within the Sulfide Unit. Each of the pumping tests was conducted at pumping rates of at least 0.25 gpm per foot of screen. After completion of the pumping tests, Golder Associates (Golder, 1996) analyzed the pump test data to derive hydrologic parameter values describing each of the water bearing units. Key conclusions of the pumping tests included:

- Demonstration that sufficient groundwater can be pumped from the Bedrock Oxide Unit to sustain extraction rates of at least 0.1 gpm per foot of screen on a continual basis;
- Demonstration that the LBFU and Bedrock Oxide Unit are in hydraulic communication; and
- Demonstration that the Sulfide Unit does not yield groundwater to wells constructed in the Bedrock Oxide Unit.

16.1.1.1.3 BHP

In January 1996, BHP acquired the Magma and the FCP site, and continued hydrologic characterization of the FCP mineralized material body. In order to further characterize hydrologic properties of the mineralized material body, BHP installed a pilot five-well pattern with adjacent observation wells, for the purpose of conducting a commercial scale pilot test. A total of 20 wells were installed for the pilot ISCR test.

The field pilot test consisted of four injection wells (BHP-6, BHP-7, BHP-8, and BHP-9) arranged at a spacing of 71 feet, and one recovery well (BHP-1) located in the center of the pattern, approximately 50 feet from each injection well. The test injection rate was 40 gpm per well. Four additional recovery wells (BHP-2, BHP-3, BHP-4, and BHP-5) were installed, outside of the injection wells for the purpose of maintaining hydraulic control. By design, the aggregate injection rate was 160 gpm and the aggregate recovery rate was 190 gpm.

Typical injection and recovery rates during the test ranged from 0.09 to 0.14 gpm per foot of screen, and reached as high as 0.44 gpm per foot of screen for a limited time in one injection well. The BHP injection and recovery pilot test wells had screen lengths ranging from 373 to 457 feet with an average length of approximately 401 feet. During the BHP test, solution injection and recovery rates were actively managed to ensure that recovery rates exceeded injection rates to maintain hydraulic control, and to ensure that sufficient storage capacity remained available in the evaporation pond to complete the test. Fluid levels observed during the test indicate that injection and recovery rates of 0.1 gpm per foot of screen can be maintained for the duration of the planned ISCR operations.

The BHP pilot test successfully demonstrated that:

- The mineralized body had sufficient hydraulic conductivity to support well to well fluid flow;
- Injected solutions could be recovered in a reliable manner; and
- Hydraulic control of injected solutions could be maintained.

No additional hydrologic characterization activities have been completed at the FCP site since the conclusion of the BHP pilot test in 1998.

16.1.1.1.4 Curis Arizona

Curis Arizona acquired the FCP project in the first quarter of 2010. Using the body of hydrologic data generated by previous FCP site owners, including 14 years of subsequent groundwater monitoring, Curis Arizona revised and updated a sub-regional groundwater flow model representing the FCP site and an area of approximately 125 square miles around the site. The groundwater flow model was prepared in support of applications to amend the operational permits initially issued to BHP by the ADEQ and United States Environmental Protection Agency (USEPA). The groundwater flow model confirmed that sufficient groundwater resources are available to support ISCR operations for the proposed duration of the project.

Additional hydrologic studies are planned by Curis Arizona for completion during the operation of the pilot facility which has been identified as the PTF. The planned studies will focus on:

- Optimization of well design and performance;
- Examination of the hydraulic relationship between the Bedrock Oxide Unit (see definition below) and the Conoco underground workings;
- Optimization of hydraulic control pumping; and
- Refinement of the sweep efficiency estimate developed by BHP.

16.1.2 FCP Site Groundwater Hydrology

16.1.2.1 Water Bearing Units

The saturated geologic formations underlying the FCP site have been divided into three distinct water bearing hydrostratigraphic units referred to as the UBFU, LBFU, and the Bedrock Oxide Unit. The Bedrock Oxide Unit is the hydrologic designation of the porphyry copper oxide mineralized body. The UBFU and LBFU are separated, in the area of the FCP, by an aquitard material referred to as the Middle fine Grained Unit (MFGU). The Bedrock Oxide Unit is underlain by the Sulfide Unit, which is effectively impermeable and considered to be hydrologic bedrock. Each of these units generally corresponds to regionally extensive hydrostratigraphic units described by the Arizona Department of Water Resources (ADWR, 1989).

16.1.2.1.1 Upper Basin Fill Unit

The UBFU consists primarily of unconsolidated to slightly consolidated sands and gravel, with lenses of finer-grained material. The upper portions of the unit are generally fine-grained and calcareous, consisting of a gradational succession of poorly graded, silt and sand with minor gravel. The UBFU ranges between 200 and 240 feet in thickness within the footprint of the proposed ISCR area (Brown and Caldwell, 1996a). The UBFU is the shallowest water bearing unit and is unconfined within the proposed ISCR area. The UBFU is locally isolated from the deeper water bearing units by the MFGU, and is not in direct hydraulic communication with the deeper water bearing units. Because it is isolated from the deeper water bearing units, the UBFU will neither affect, nor be affected by, the planned ISCR operations.

16.1.2.1.2 Middle Fine Grained Unit

The MFGU underlies the UBFU and, where it is present, hydraulically isolates the deeper water bearing units from the UBFU. The MFGU composition ranges from calcareous clay to silty sand, and includes reworked broken clay clasts, carbonaceous film, and thin interbeds of fine sand. The unit is generally 20 to 30 feet thick beneath the planned ISCR site. The relatively flat-lying base of the MFGU is an indication that faulting that affected the mineralized material body ceased prior to the deposition of this unit (Brown and Caldwell, 1996a). The MFGU is an important component of the hydrologic framework within which the planned ISCR operation will be developed. The MFGU is a low hydraulic conductivity layer that maintains confined groundwater conditions within the LBFU which overlies and directly recharges groundwater to the Bedrock Oxide Unit.

16.1.2.1.3 Lower Basin Fill Unit

The LBFU underlies the MFGU at the proposed ISCR site and comprises the lower portion of the sedimentary fill overlying Precambrian bedrock. The MFGU-LBFU contact at the planned ISCR site ranges in depth from 260 to 300 feet below ground surface (bgs). The LBFU consists of coarse gravel, fanglomerate, conglomerate, and breccia, and is distinguished by a greater degree of consolidation than is exhibited by the UBFU. The conglomerate portion of the LBFU may correlate with the Gila and Whitetail Conglomerates described in the region (Conoco, 1976). Substantial bedrock structural relief has resulted in significant variation in LBFU thickness, which ranges from approximately 70 feet to more than 750 feet.

The LBFU overlies the Bedrock Oxide Unit, and would provide recharge to replace groundwater extracted from the mineralized material body.

16.1.2.1.4 Bedrock Oxide Unit

Bedrock underlying the LBFU in the proposed ISCR area consists primarily of Precambrian quartz monzonite and Tertiary granodiorite porphyry. The bedrock is divided into an upper oxide zone and lower sulfide zone based on the copper mineral assemblage. The oxide bedrock zone is estimated to range in thickness from approximately 200 feet to over 1,500 feet (Brown and Caldwell, 1996a).

The top of the oxide bedrock zone consists of a weathered rubbly mixture of fracture filling and angular bedrock fragments, and has been demonstrated to be a zone of enhanced hydraulic conductivity. Below this weathered zone, the oxide consists of extensively fractured quartz monzonite, granodiorite, and associated dikes. Movement of groundwater through the oxide bedrock zone is controlled by secondary permeability features such as faults, fractures, and associated brecciation. Statistical analysis of drill core indicates an average of 10 to 15 open fractures per foot in the Bedrock Oxide Unit (Applied Research Associates, Inc. [ARA], 1995)

Aquifer tests conducted in the Bedrock Oxide Unit by Conoco, Magma Copper Company, and BHP have demonstrated that the extensive fracturing observed in the mineralized material body is interconnected to the point that the fractured rock behaves as porous media under pumping conditions (Brown and Caldwell, 1996a). Pumping and injection tests conducted by each of the previous site owners were successful in establishing, maintaining, and controlling consistent fluid flow through the Bedrock Oxide Unit.

16.1.2.1.5 Sulfide Unit

The Bedrock Oxide Unit is underlain locally by a zone of sulfide mineralization that occurs in the same quartz monzonite and granodiorite rocks that compose the Bedrock Oxide Unit. The fracture frequency and resulting permeability of the fracture network within the sulfide zone is significantly less than that observed in the overlying oxide zone. The Sulfide Unit is significantly less permeable than the over lying Bedrock Oxide Unit, with an average of 6 to 10 open fractures per foot (ARA, 1995).

16.1.2.2 Hydraulic Conductivity

The range of hydraulic conductivities measured in each of the water bearing and non-water bearing units are shown on Figure 16-1, which includes hydraulic conductivity values measured by Conoco, Magma, and BHP. The relationships shown on that figure include:

- Hydraulic conductivity values measured within the Bedrock Oxide Unit (mineralized material body) are similar, in part, to those measured in the overlying water bearing alluvial basin fill deposits and are greater than those measured in the Sulfide Unit.
- Hydraulic conductivities measured in the MFGU are lower than those measured in any other units including the Sulfide Unit. This relationship demonstrates how the MFGU inhibits groundwater flow between the UBFU and the LBFU.

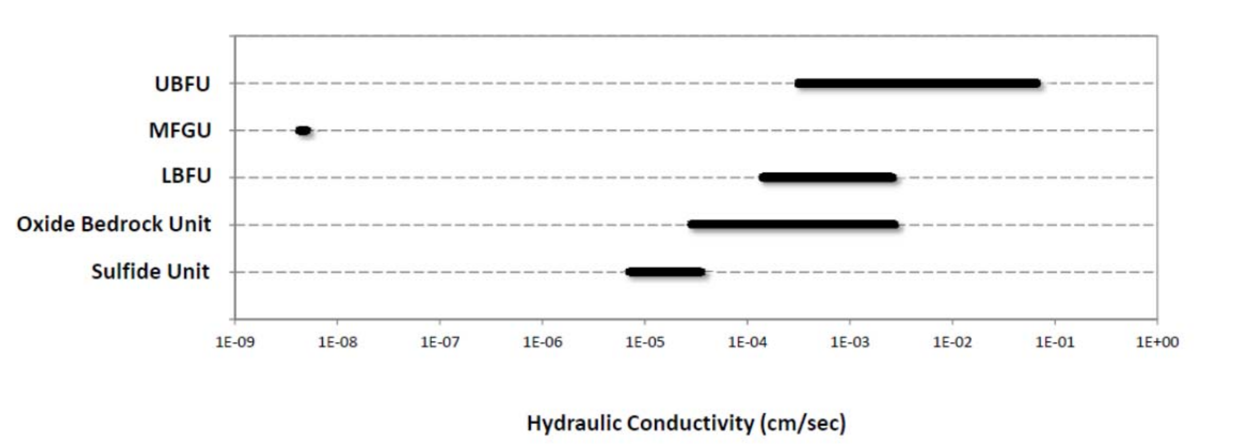


Figure 16-1: Hydraulic Conductivity

(Source: Haley & Aldrich)

16.1.3 Hydraulic Control and Net Groundwater Extraction

The planned ISCR facility consists of an array of injection and recovery wells that will be used to inject a low pH lixiviant solution and recover the copper laden solution (PLS). At full scale production, the anticipated lixiviant injection rate and PLS extraction rate is expected to be equal at approximately 11,000 gpm (will start at 7,400 gpm initially and later be upgraded to 11,000 gpm at year 5). An additional volume of groundwater will be extracted to maintain hydraulic control of the injected solutions using perimeter wells. Including hydraulic control pumping, aggregate injection and recovery rates in the ISCR area will be carefully balanced to ensure that fluid extraction always exceeds injection, and that hydraulic control is maintained for the duration of operations and rinsing.

The active injection and recovery well field will be surrounded by a network of perimeter wells and observation wells emplaced to withdraw an additional volume of water that will ensure hydraulic control of the injected solutions is maintained at all times. Withdrawal of the additional volume of groundwater will create a cone of depression around the active ISCR well field thereby ensuring inward groundwater flow. The BHP pilot test demonstrated that hydraulic control could be established and maintained within the FCP mineralized material body. The results of their successful demonstration of hydraulic control were submitted to ADEQ in a memo dated April 6, 1998 (BHP, 1998).

The anticipated hydraulic control pumping rate is approximately 3% to 10% of the recovery pumping. When combined with other operationally required on-site groundwater pumping, net groundwater extraction is expected to be approximately 1,100 gpm. Groundwater will be extracted at the individual perimeter wells at rates ranging from 5 to 30 gpm to maintain hydraulic control. The sub-regional groundwater flow model developed by Curis Arizona (Brown and Caldwell, 2011) has demonstrated that sufficient groundwater resources exist within the Bedrock Oxide Unit and the overlying LBFU, or lower conglomerate, (the lower portion of the sedimentary fill overlying Precambrian bedrock) to easily support the net groundwater extraction rate of 1,100 gpm for the duration of the proposed ISCR operations.

16.1.3.1 Well Design

The injection and recovery well design proposed by Curis Arizona is based on experience gained from the BHP pilot test, and is compliant with the Underground Injection Control (UIC) Permit issued to Florence Copper in 1997. Both the well design proposed by Curis Arizona and the well design employed by BHP incorporate a casing string that extends from ground surface, through the UBFU, MFGU, LBFU and at least 40 feet below the top of the Bedrock Oxide Unit. The casing string will be composed of materials designed to withstand the proposed pressure and chemistry of the injected fluid. It will be cemented for its entire length and must pass a mechanical integrity test as defined by the USEPA. The proposed ISCR wells will be constructed with screened intervals located exclusively within the Bedrock Oxide Unit. A schematic well diagram is included as Figure 16-2.

An alternative design, as shown in Figure 16-3, will be used in the Phase 1 Production Test Facility well field. Contingency cost has been added to the initial capital of Phase 2 commercial operations to further evaluate this design, if necessary, pending the outcome of the Phase 1 well field testing.

The active ISCR well field will be surrounded by a network of perimeter wells that will be pumped to maintain positive hydraulic control. The perimeter wells will be surrounded by a network of observation wells that will be used to monitor hydraulic control at the edge of the ISCR well field. The perimeter and observation wells will be constructed using a well design identical to the injection and recovery wells.

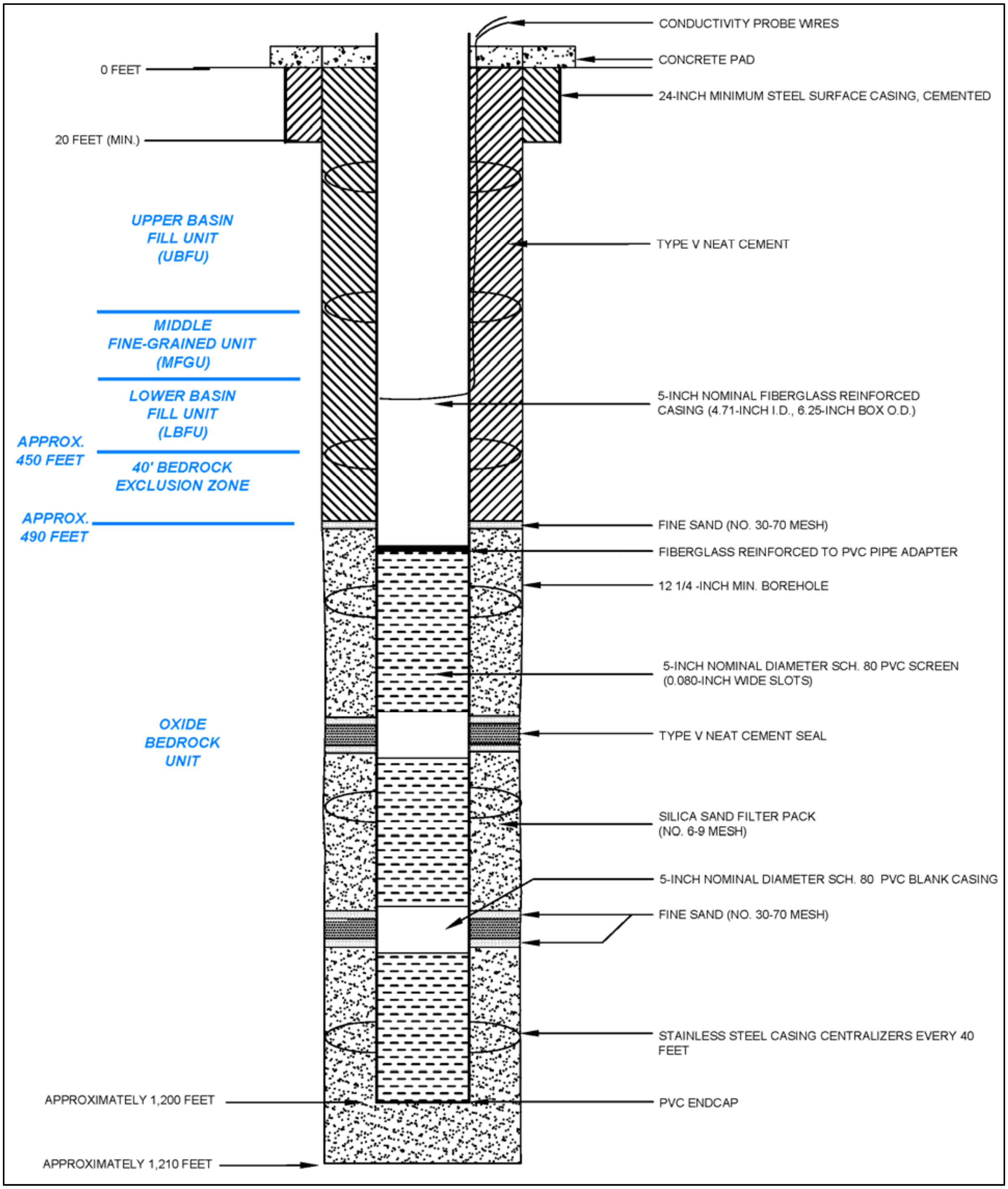


Figure 16-2: Phase II Injection and Recovery Well Design

(Source: Haley & Aldrich)

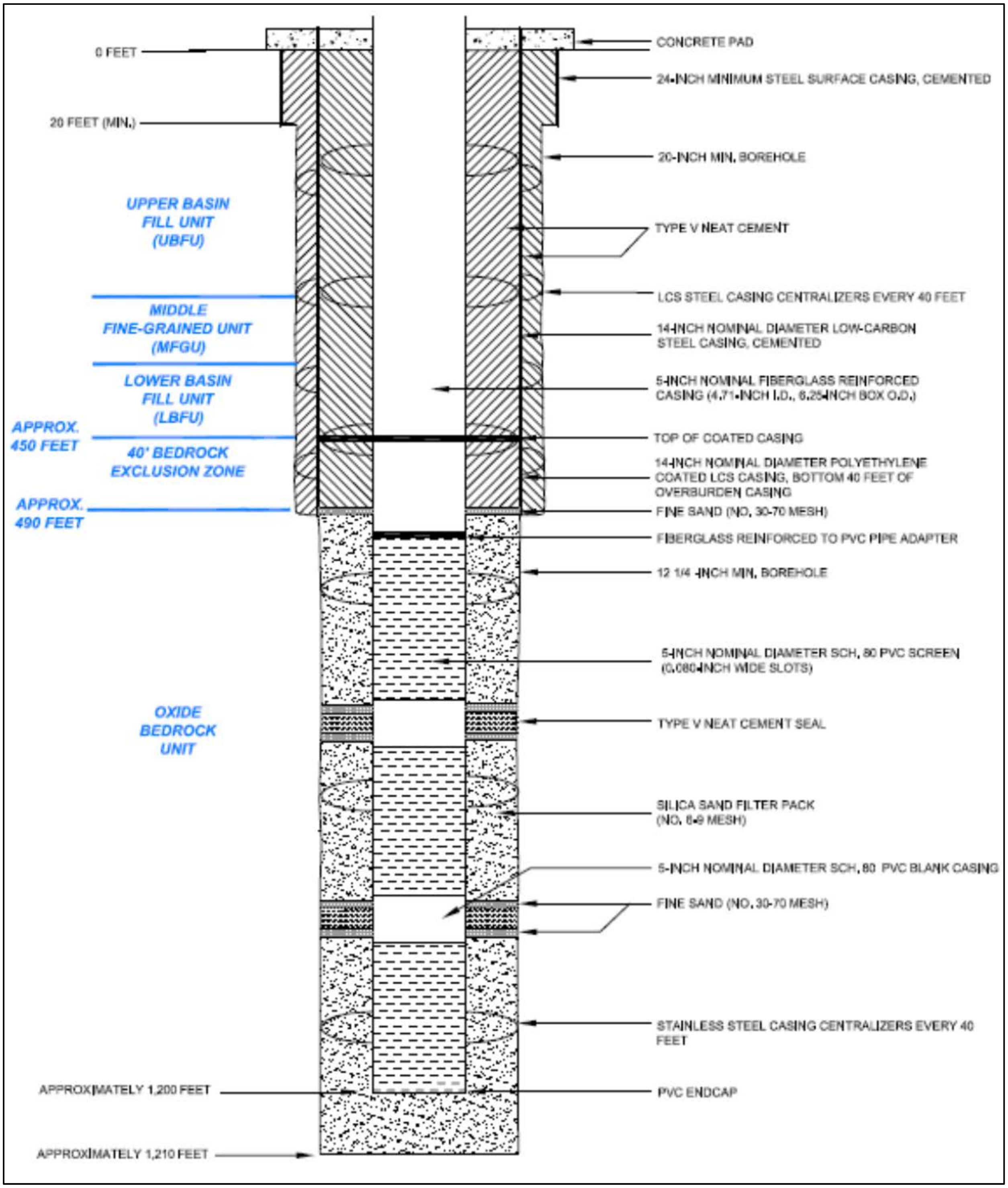


Figure 16-3: Phase I PTF Injection and Recovery Well Design

(Source: Haley & Aldrich)

16.1.3.2 Injection Rate

The rate at which raffinate is injected in each well will vary based on the length of the injection interval. Because the oxide zone varies in thickness, the length of the injection interval in each well will vary accordingly. The rate of fluid injection in wells with longer injection intervals will be greater than the rate in wells with shorter injection intervals to maintain a consistent rate of flow through the oxide zone on a per-foot of thickness basis. In addition, Curis Arizona proposes to install packers in each well to enhance injectate distribution by isolating zones within the oxide zone that are not conducive to copper extraction. Work performed by Magma (Golder, 1996) and BHP (Draft Field Test Report, October 1999) has demonstrated that an injection rate of 0.1 gpm per foot of screened interval is achievable and sustainable. Curis Arizona has modeled development costs based on a conservative average injection rate of 0.1 gpm per foot of well screen.

16.1.3.3 Sweep Efficiency

Sweep efficiency is a term used to define the percentage of the mineralized material body contacted by injected solutions within a given injection and recovery well spacing and pattern under purely advective flow conditions. Sweep efficiency varies based on a combination of formation hydrologic properties, well spacing, and well layout pattern. Curis Arizona plans to use a five-spot well layout pattern, similar to that employed by BHP. The planned five-spot pattern will be arranged with one injection well at the center, and four recovery wells at the corners of each square cell.

The BHP pilot test facility used the five-spot pattern. The distance between the injection and recovery wells was approximately 50 feet, and the distance between injector to injector or recovery to recovery wells was approximately 71 feet. Prior to running the pilot test, BHP estimated sweep efficiency would be approximately 80% based solely on experience from the oilfield industry. Oilfield sweep efficiency would most likely be conservative in comparison to the Florence Copper oxide deposit. Oilfield geologic conditions would tend to be less transmissive and solutions are more viscous, which would decrease the rate of fluid movement through the formation.

Curis Arizona plans to expand the well spacing to include distances of approximately 71 feet between injection and recovery wells, and 100 feet from injector to injector and recovery to recovery well. Curis Arizona will refine the estimated sweep efficiency based on operational data obtained from the planned PTF.

16.2 COPPER EXTRACTION FORECAST

The copper extraction forecast summary for the Curis FCP is presented in Table 16-1. The copper extraction forecast was balanced to provide a target production of approximately 55 million pounds per year through year 5 and approximately 85 million pounds per year by year 7. The initial commercial phase will have a nominal SX throughput of 7,400 gpm, and the second phase will increase the nominal throughput to 11,000 gpm. The following key assumptions were used to generate the copper extraction forecast.

- The resource model is based on key physical properties provided in SRK's 500-foot by 500-foot blocks (see section 14 for details).
- Copper recovery is based on the METCON recovery curve and a conservative sweep efficiency factor over a four-year recovery cycle (see Section 13 for details).
- The injection and recovery well flow rate is based on an average of 0.1 gpm per linear foot of well screen.

The resource data was provided by SRK in 500-foot by 500-foot resource blocks with key data required for predicting copper extraction. An estimate of mineralized material for each resource block was generated based on measured and indicated, inferred, greater or less than 0.05% copper, oxide, sulfide, and unassigned material. Physical properties such as depth to injection zone, thickness of injection zone, and surface area within the resource outline are also included. Only oxide material classified as measured and indicated was used for the copper extraction schedule.

The copper recovery in each resource block is predicted to be achieved over four years. The recent test work was designed to simulate in-situ recovery and has produced favorable recovery predictions when compared to the PEA and the Lichtner recovery model, as described in Section 13 of this document. Curis Arizona has applied a conservative sweep efficiency factor that results in the 4-year recovery period.

The injection and recovery well flow rate of 0.1 gpm per linear foot of well screen (i.e thickness of mineralized material under leach) is a key parameter used in the copper extraction schedule. This flow rate is applied to the mineralized material thickness of each resource block to determine the flow rate per well. In years 1 through 3 a factor of 0.15 gpm per linear foot of well screen was used due to the characteristics of the resource encountered during this time period (i.e. less than average thickness seen in the typical Florence oxide zone). Aquifer tests conducted within the Bedrock Oxide Zone (Golder, 1996) were conducted at flow rates up to 0.25 gpm per linear foot of well screen.

16.2.1 Copper Extraction Sequence

The copper extraction sequence begins on the ASLD lease area at a rate of approximately 55 million pounds per year through year 5 and is ramped up to approximately 85 million pounds per year by year 7. The initial production area is located north of the canal to facilitate piping arrangements in the ISCR field. The extraction sequence progresses in an east to west fashion, generally following the groundwater flow direction. The extraction sequence is depicted graphically by period on Figure 16-4 through Figure 16-7.

The process of sequencing each 500-foot by 500-foot resource block was done in a way to provide a reasonably balanced copper production rate. The recovered copper for each resource block was calculated using the four-year METCON recovery curve which predicts annual copper recovery from each block. The copper extraction sequence was balanced by scheduling whole blocks and fractions of blocks in each year as necessary to provide the target copper pounds extracted. The detailed block by block copper extraction is shown in Table 16-2.

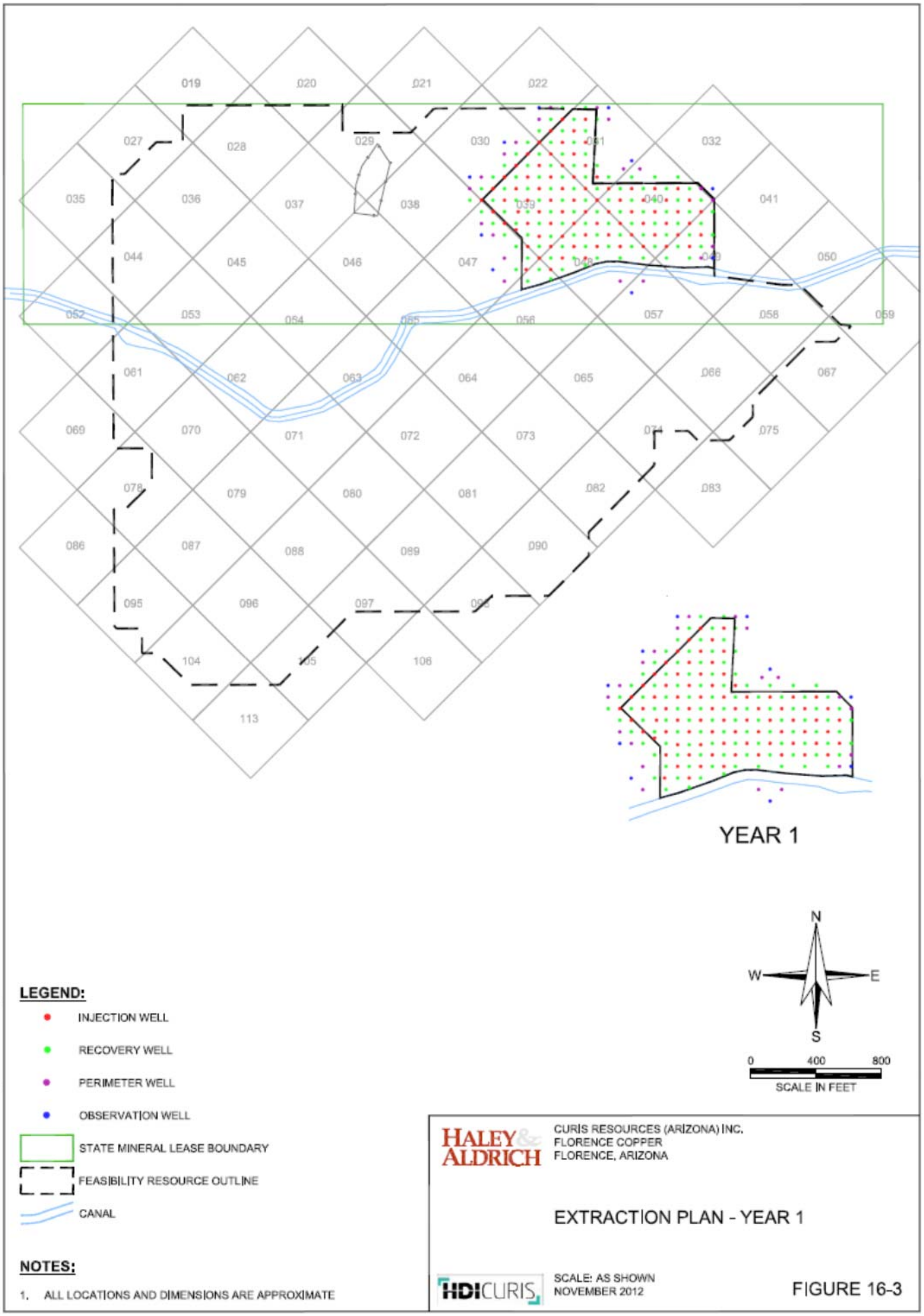


Figure 16-4: Extraction Plan – Year 1

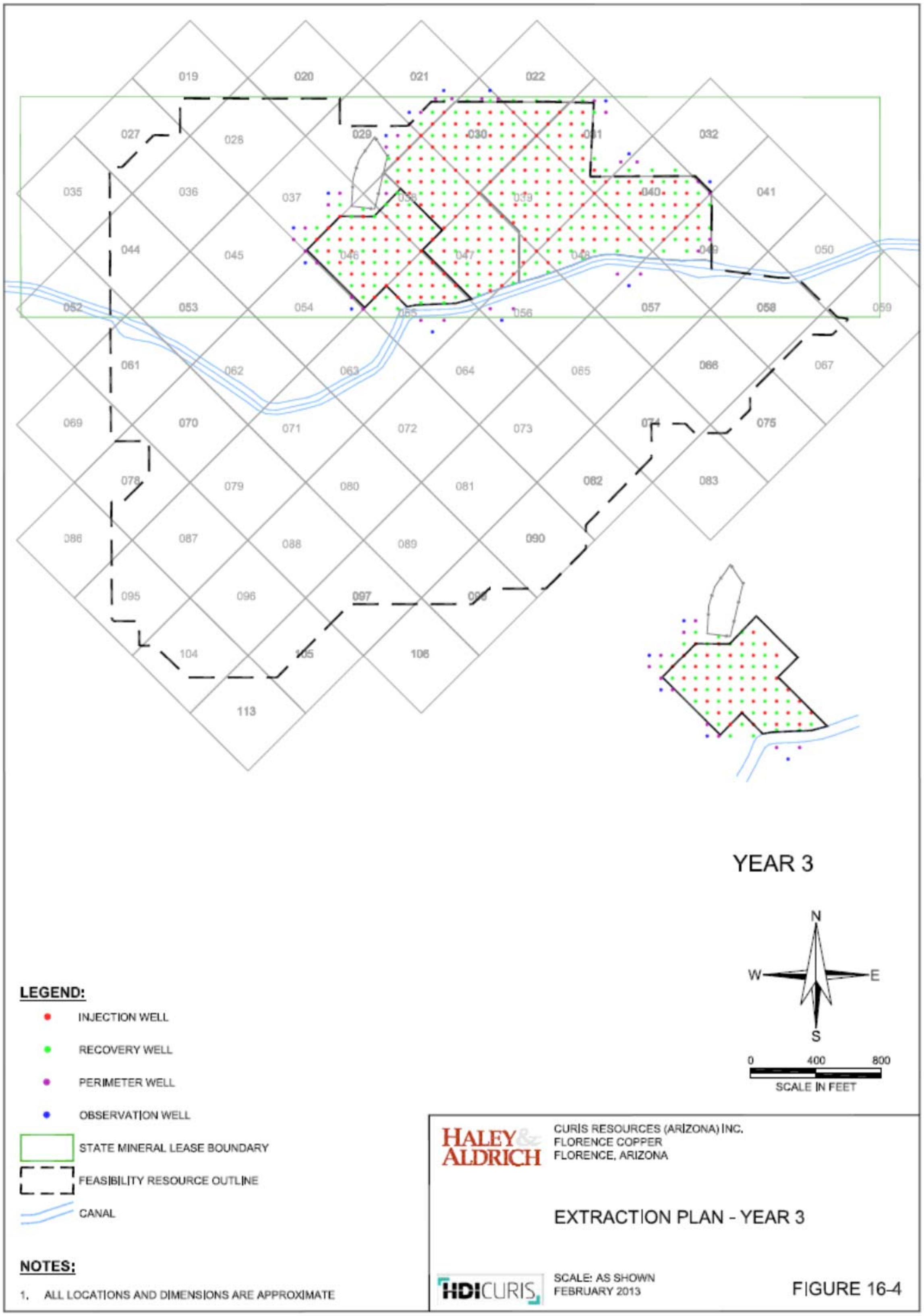


Figure 16-5: Extraction Plan – Year 3

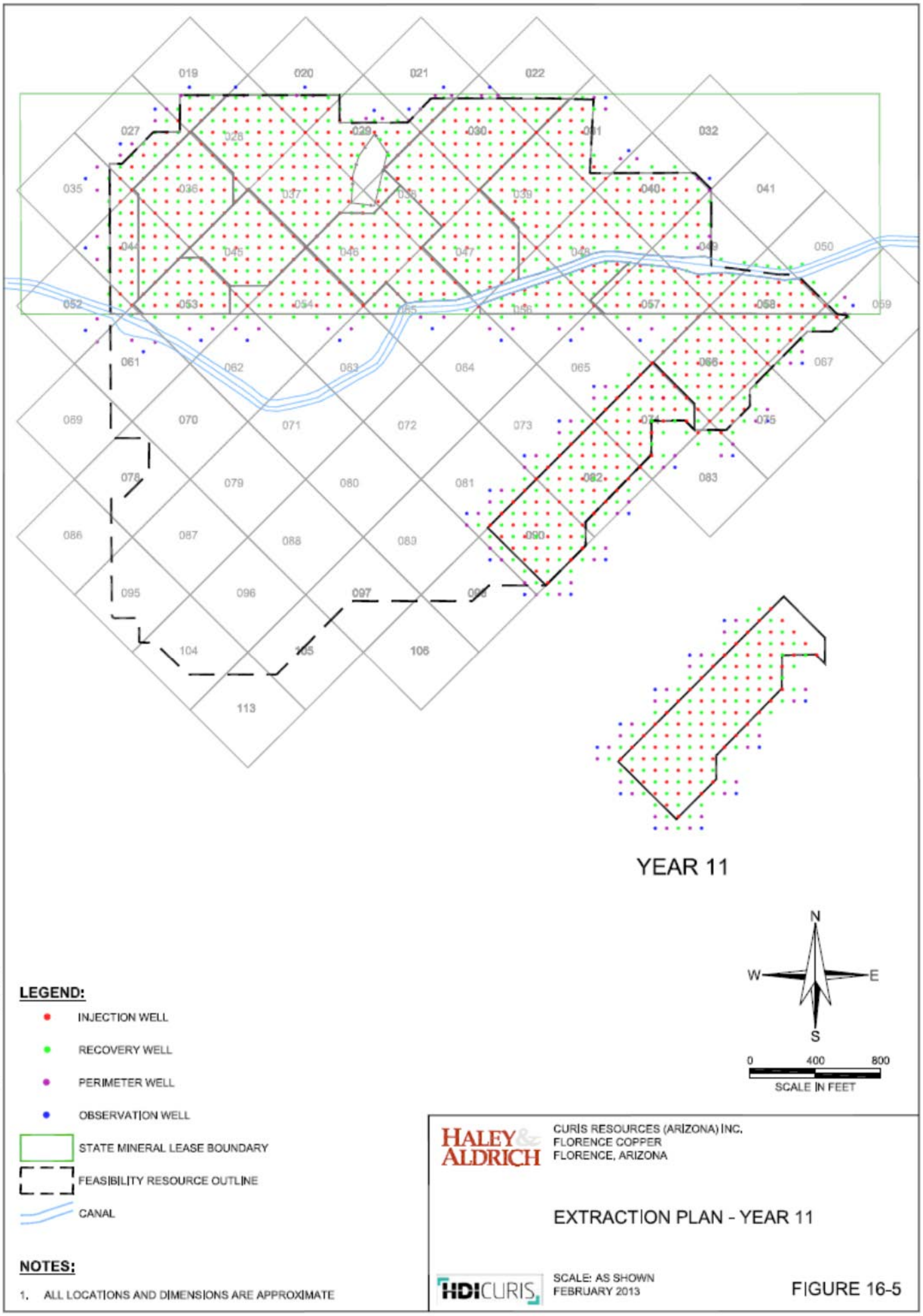


Figure 16-6: Extraction – Year 11

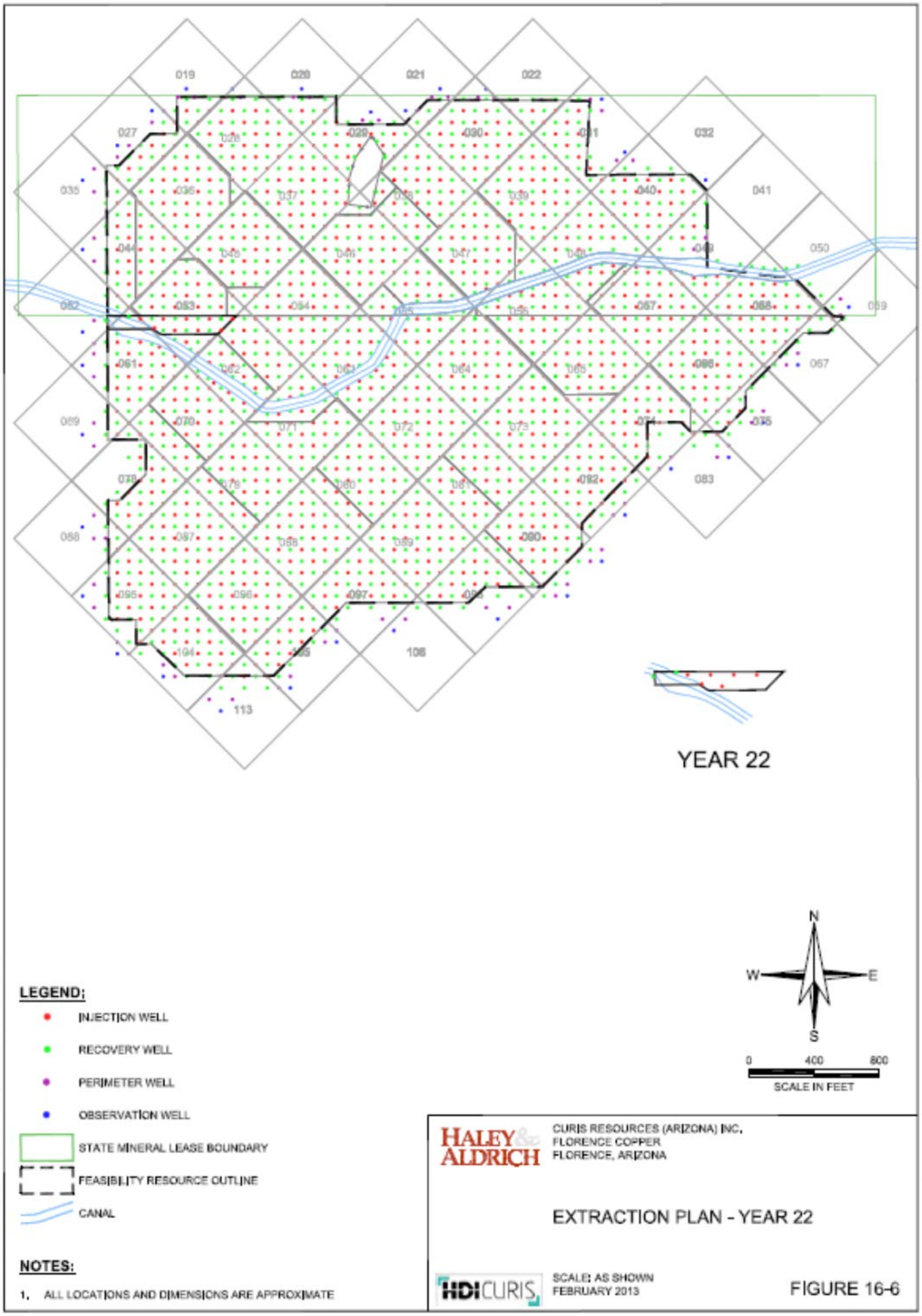


Figure 16-7: Extraction Plan – Year 22

Table 16-1: Copper Extraction Schedule

Curis Resources (Arizona), Inc.
Florence Copper Project - Pre-Feasibility Study
Table 16-1: Copper Extraction Schedule

CURIS COPPER EXTRACTION SCHEDULE 8-Nov-12
VERSION 17-1a: START ON STATE LAND FINISH ON PRIVATE - NEW RECOVERY CURVE
START Ramp Up to 85 MIL in YEAR 6 Plus PTF Prod (RK Scenario)

PERIOD (Years)	TOTALS	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13
Total #'s Copper Extracted	1,698,045,792	1,642,195	1,700,000	41,357,494	55,256,778	55,649,483	55,565,617	55,301,920	70,833,991	85,821,101	85,454,673	85,612,285	85,593,181	85,371,596	85,547,612	86,033,489
Check=0	0															
State Land Lease Copper #'s for Royalty [1]	699,928,342	1,642,195	1,700,000	41,357,494	55,256,778	55,649,483	55,565,617	55,301,920	70,833,991	85,821,101	85,454,673	85,612,285	66,652,046	27,206,174	9,475,007	2,399,579
Check=0	0															
#'s Acid Consumed (x 1000)	8,108,554	8,211	21,490	206,787	276,284	278,247	277,828	276,510	354,170	429,106	427,273	428,061	427,966	426,858	427,738	430,167
VARIABLE FLOW RATE (Year 1-3 flow rate is 0.15 gpm/foot of screen)																
Flow to SX, gpm		0	0	2,402	4,974	6,804	7,203	6,634	5,873	7,250	8,284	9,735	10,522	10,018	11,000	10,925
Calculated PLS Grade g/L (Cu Pounds Extracted/Flow to SX)				3.9	2.5	1.9	1.8	1.9	2.7	2.7	2.4	2.0	1.9	1.9	1.8	1.8
Stacking Flow, gpm		0	0	0	0	0	0	0	0	0	0	0	0	0	337	0
Rinse Flow, gpm		0	0	0	0	0	0	857	833	840	837	829	830	1,656	1,787	1,806
Hyd Control Flow, gpm		0	0	72	149	204	216	225	201	243	274	317	341	350	394	382
New Wells Required																
Injection Wells	971		79	55	34	19	15	23	62	25	51	70	69	86	33	39
Recovery Wells	1104		105	61	44	28	24	24	71	27	72	73	86	113	37	23
Perimeter Wells	206		20	16	10	8	8	4	10	6	18	12	22	24	6	0
Observation Wells	102		10	8	5	4	4	2	5	3	9	6	11	12	3	0
Average Well Depth to BEZ	504		386	389	429	514	559	500	522	791	598	387	400	439	404	393
Average Well Depth in Oxide	443		198	239	318	455	851	693	384	670	408	350	430	411	466	484
Well Conversions																
Temp Perim/Obser to Injection	106		0	7	5	4	2	3	6	5	7	0	2	6	8	3
Temp Perim/Obser to Recovery	90		0	7	3	2	1	2	2	3	11	6	1	4	4	10
Closure of Injection and Recovery Wells																
Inj and Rec Wells	2,383	0	0	0	0	0	0	0	0	184	130	86	53	42	52	141
Average Well Depth		0	0	0	0	0	0	0	0	585	628	748	970	1,410	1,193	906
Closure of Core Holes and Misc Wells [2]																
Core Holes and Misc Wells	322		77	20	11	5	10	9	13	3	38	19	38	47	0	0
Average Well Depth			1,136	1,579	1,125	672	1,306	1,220	944	1,333	881	1,138	1,116	1,312		
Cultural Mitigation Sites (Mining Impact Only)																
Number of Sites	28	3	2	0	0	1	0	1	2	3	2	0	2	1	0	1

PERIOD (Years)	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Total #'s Copper Extracted	85,442,172	85,721,009	85,901,538	85,554,953	85,280,751	85,452,700	85,416,942	85,243,645	50,163,307	19,560,987	6,459,338	1,107,038	0				
State Land Lease Copper #'s for Royalty [1]	0	0	0	0	0	0	0	0	0	0	0	0	0				
#'s Acid Consumed (x 1000)	427,211	428,605	429,508	427,775	426,404	427,263	427,085	426,218	250,817	97,805	32,297	5,535	0				
Flow to SX, gpm	10,467	11,000	10,348	10,764	11,000	10,969	10,637	11,000	9,564	6,339	4,010	766	0	0			
Calculated PLS Grade g/L (Cu Pounds Extracted/Flow to SX)	1.9	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.2	0.7	0.4	0.3	0.0	0.0			
Stacking Flow, gpm	0	240	0	0	220	0	0	394	0	0	0	0	0	0			
Rinse Flow, gpm	1,784	1,796	1,817	1,812	1,781	1,801	1,784	1,729	1,793	1,714	1,790	1,675	1,750	1,701			
Hyd Control Flow, gpm	368	391	365	377	390	383	373	394	33	33	33	33	33	33			
Injection Wells	59	51	56	27	54	30	28	6	0	0	0	0	0				
Recovery Wells	62	55	68	30	39	28	32	2	0	0	0	0	0				
Perimeter Wells	8	8	12	2	2	4	6	0									
Observation Wells	4	4	6	1	0	2	3	0									
Average Well Depth to BEZ	432	515	836	458	484	533	819	597	0	0	0	0	0				
Average Well Depth in Oxide	469	491	360	678	499	743	642	848	0	0	0	0	0				
Temp Perim/Obser to Injection	6	8	8	6	7	3	10	0	0	0	0	0	0				
Temp Perim/Obser to Recovery	3	4	4	3	9	2	9	0	0	0	0	0	0				
Inj and Rec Wells	60	141	149	158	0	209	157	0	130	118	136	66	109	63	87	112	
Average Well Depth	1,461	1,006	737	830	0	850	869	877	901	1,006	1,196	1,135	983	1,276	1,460	947	
Core Holes and Misc Wells	6	10	12	0	0	4	0	0									
Average Well Depth	1,044	1,670	1,375			1,147											
Number of Sites	2	4	0	1	2	1	0	0									

Note 1: Copper #'s from State Lease Land is for royalty calculations, it is not addititve to the Total #'s Copper Extracted line.
Note 2: Does not include coreholes or wells noted as abandoned in data base, or core holes and wells abandoned in Phase 1
Note: Version 17-1a has injection and recovery well depths broken out for depth to bedrock exclusion zone (BEZ) and depth from BEZ to bottom of oxide (in oxide)

Table 16-2: Copper Extraction Block Detail

Curis Resources (Arizona), Inc.
Florence Copper Project - Pre-Feasibility Study
Table 16-2: Copper Extraction Block Detail

Copper Extraction Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Total
Total Copper Extracted (Pounds)	41,357,494	55,256,778	55,649,483	55,565,617	55,301,920	70,833,991	85,821,101	85,454,673	85,612,285	85,593,181	85,371,596	85,547,612	86,033,489	85,442,172	85,721,009	85,901,538	85,554,953	85,280,751	85,452,700	85,416,942	85,243,645	50,163,307	19,560,987	6,459,338	1,107,038	0	1,694,703,597

Fraction	Block ID	Year Start	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
0.5	49	1	1,659,091	783,519	306,297	130,900	0	0																						2,879,807
1	40	1	7,501,007	3,542,408	1,384,818	591,821	0	0																						13,020,053
0.5	48	1	14,555,158	6,873,785	2,687,138	1,148,385	0	0																						25,264,466
1	31	1	4,154,839	1,962,155	767,056	327,812	0	0																						7,211,862
1	39	1	13,487,399	6,369,528	2,490,011	1,064,140	0	0																						23,411,078
1	47	2		19,941,779	9,417,659	3,681,603	1,573,383	0	0																					34,614,424
1	22	2		611,007	288,553	112,803	48,208	0	0																					1,060,570
1	30	2		5,128,687	2,422,062	946,846	404,647	0	0																					8,902,242
0.7	38	2		10,043,910	4,743,314	1,854,282	792,453	0	0																					17,433,958
0.1	38	3			1,434,844	677,616	264,897	113,208	0	0																				2,490,565
1	46	3			20,353,779	9,612,229	3,757,665	1,605,889	0	0																				35,329,562
0.6	55	3			9,353,953	4,417,476	1,726,904	738,016	0	0																				16,236,348
0.4	55	4				6,235,968	2,944,984	1,151,269	492,011	0	0																			10,824,232
1	54	4				17,768,909	8,391,504	3,280,453	1,401,946	0	0																			30,842,812
0.17	53	4				6,994,827	3,303,361	1,291,368	551,884	0	0																			12,141,440
0.78	53	5					32,093,913	15,156,598	5,925,100	2,532,172	0	0																		55,707,783
0.05	53	6						2,057,302	971,577	379,814	162,319	0	0																	3,571,012
1	45	6						45,439,888	23,037,714	9,006,030	3,848,849	0	0																	81,332,481
1	37	7							16,670,393	7,872,722	3,077,647	1,315,274	0	0																28,936,037
0.2	38	7							2,869,689	1,355,232	529,795	226,415	0	0																4,981,131
1	29	7							6,777,932	3,200,930	1,251,325	534,771	0	0																11,764,958
1	21	7							263,153	124,276	48,583	20,763	0	0																456,775
1	20	7							1,745,736	824,437	322,293	137,736	0	0																3,030,203
1	28	7							21,360,144	10,087,492	3,943,458	1,685,290	0	0																37,076,384
0.1	36	7							3,753,823	1,772,772	693,022	296,172	0	0																6,515,789
0.9	36	8								33,784,410	15,954,948	6,237,196	2,665,550	0	0															58,642,104
0.5	44	8								14,514,385	6,854,530	2,679,610	1,145,168	0	0															25,193,693
0.5	44	9									14,514,385	6,854,530	2,679,610	1,145,168	0	0														25,193,693
1	52	9									21,397	10,105	3,950	1,688	0	0														37,141
1	35	9									1,555,354	734,528	287,146	122,716	0	0														2,699,743
1	27	9									8,135,588	3,842,094	1,501,972	641,888	0	0														14,121,543
1	19	9									2,746,160	1,296,895	506,989	216,669	0	0														4,766,713
1	58	9									3,353,572	1,583,750	619,128	264,593	0	0														5,821,043
0.5	49	9									1,659,091	783,519	306,297	130,900	0	0														2,879,807
1	57	9									14,028,938	6,625,274	2,589,988	1,106,867	0	0														24,351,066
0.1	48	9									2,911,032	1,374,757	537,428	229,677	0	0														5,052,893
0.4	48	10										11,644,126	5,499,028	2,149,710	918,708	0	0													20,211,573
1	56	10										18,769,240	8,863,918	3,465,132	1,480,871	0	0													32,579,161
1	67	10										658,740	311,095	121,615	51,974	0	0													1,143,424
1	581	10										2,503,685	1,182,384	462,224	197,538	0	0													4,345,831
1	75	10										1,112,311	525,298	205,352	87,760	0	0													1,930,721
1	66	10										14,521,186	6,857,742	2,680,866	1,145,704	0	0													25,205,498
1	83	10										145,213	68,578	26,809	11,457	0	0													252,056
1	74	11											17,049,461	8,051,739	3,147,630	1,345,182	0	0												29,594,012
1	82	11											18,774,926	8,866,603	3,466,181	1,481,320	0	0												32,589,029
0.85	90	11											13,395,939	6,326,335	2,473,126	1,056,924	0	0												23,252,323
0.15	90	12												2,363,989	1,116,412	436,434	186,516	0	0											4,103,351
1	98	12												6,945,905	3,280,257	1,282,336	548,024	0	0											12,056,521
1	106	12												45,223	21,357	8,349	3,568	0	0											78,497
1	113	12												580,765	274,271	107,219	45,822	0	0											1,008,077
1	105	12												4,799,008	2,266,368	885,981	378,636	0	0											8,329,993
1	97	12												7,866,450	3,714,991	1,452,285	620,654	0	0											13,654,380
1	89	12												17,368,633	8,202,470	3,206,555	1,370,365	0	0											30,148,022
0.33	81	12												9,361,089	4,420,846	1,728,222	738,579	0	0											16,248,736
0.67	81	13													19,005,848	8,975,658	3,508,813	1,499,539	0	0										32,989,858
1	73	13													28,931,433	13,663,092	5,341,251	2,282,656	0	0										50,218,431
0.05	65	13													1,818,287	858,700	335,688	143,461	0	0										3,156,135
0.95	65	14														34,547,452	16,315,300	6,378,066	2,725,753	0	0									59,966,571
1	571	14														9,316,122	4,399,610	1,719,920	735,031	0	0									16,170,682
0.9	561	14														5,090,342	2,403,953	939,767	401,622	0	0									8,835,685
0.1	561	15															565,594	267,106	104,419	44,625	0	0								981,743
1	64	15															16,286,943	7,691,634	3,006,856	1,285,021	0	0								28,270,453
1	72	15															16,861,717	7,963,076	3,112,969	1,330,370	0	0								29,268,132

Table 16-2: Copper Extraction Block Detail (Continued)

Curis Resources (Arizona), Inc.
Florence Copper Project - Pre-Feasibility Study
Table 16-2: Copper Extraction Block Detail

Copper Extraction Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Total
Total Copper Extracted (Pounds)	41,357,494	55,256,778	55,649,483	55,565,617	55,301,920	70,833,991	85,821,101	85,454,673	85,612,285	85,593,181	85,371,596	85,547,612	86,033,489	85,442,172	85,721,009	85,901,538	85,554,953	85,280,751	85,452,700	85,416,942	85,243,645	50,163,307	19,560,987	6,459,338	1,107,038	0	1,694,703,597

Fraction	Block ID	Year Start	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
0.85	80	15															15,809,977	7,466,384	2,918,800	1,247,389	0	0								27,442,549
0.15	80	16																2,789,996	1,317,597	515,082	220,127	0	0							4,842,803
1	88	16																27,211,199	12,850,698	5,023,665	2,146,932	0	0							47,232,495
0.95	96	16																19,548,735	9,232,041	3,609,040	1,542,372	0	0							33,932,188
0.05	96	17																	1,028,881	485,897	189,949	81,177	0	0						1,785,905
1	104	17																	9,591,923	4,529,859	1,770,837	756,791	0	0						16,649,411
1	95	17																	7,239,877	3,419,088	1,336,608	571,218	0	0						12,566,791
1	87	17																	24,627,673	11,630,608	4,546,701	1,943,094	0	0						42,748,077
0.17	79	17																	6,660,814	3,145,621	1,229,703	525,530	0	0						11,561,668
0.83	79	18																		32,520,444	15,358,030	6,003,845	2,565,825	0	0					56,448,144
0.67	71	18																		16,494,043	7,789,439	3,045,090	1,301,361	0	0					28,629,932
0.33	71	19																			8,123,932	3,836,589	1,499,820	640,969	0	0				14,101,310
1	63	19																			12,779,056	6,035,007	2,359,238	1,008,252	0	0				22,181,554
1	551	19																			3,002,316	1,417,867	554,280	236,879	0	0				5,211,342
1	541	19																			8,098,800	3,824,721	1,495,181	638,986	0	0				14,057,688
0.38	62	19																			17,317,897	8,178,510	3,197,188	1,366,362	0	0				30,059,956
0.62	62	20																				28,255,515	13,343,885	5,216,465	2,229,327	0	0			49,045,192
0.6	70	20																				20,941,985	9,890,014	3,866,258	1,652,298	0	0			36,350,556
0.4	70	21																					13,961,324	6,593,343	2,577,506	1,101,532	0	0		24,233,704
1	78	21																					6,292,522	2,971,692	1,161,710	496,473	0	0		10,922,396
1	86	21																					536,040	253,149	98,962	42,293	0	0		930,445
1	69	21																					467,555	220,807	86,319	36,890	0	0		811,570
1	61	21																					23,120,597	10,918,880	4,268,468	1,824,188	0	0		40,132,133
0.25	531	21																					4,658,816	2,200,162	860,099	367,575	0	0		8,086,652
0.75	531	22																						13,976,448	6,600,485	2,580,298	1,102,725	0	0	24,259,956
1	521	22																						54,656	25,812	10,090	4,312	0	0	94,871

16.2.2 Calculation of Number of Injection and Recovery Wells

The key equipment for extraction of copper and maintaining hydraulic control in an ISCR project is the injection, recovery, perimeter, and observation wells and associated equipment. The well counts listed in the copper extraction forecast summary (Table 16-1) were determined from the actual well field layout for the ISCR area as shown on Figure 16-4 through Figure 16-7. The well field layout uses the base grid layout of 100 feet between wells in a row and 50 feet spacing between rows, which equates to approximately 70 feet from injection well to recovery well. The base grid was then adjusted for edge effects along the edge of the resource area, boundary effects related to the canal, and exclusion areas such as cultural sites.

During each forecast period, wells must be installed for the new blocks coming on line. The forecast shows these wells being installed in the period prior to the forecast of copper recovered from the block in which the wells are installed. There are 971 injection wells and 1,104 recovery wells projected for the ISCR area.

The perimeter and observation wells are installed along the outer edge of the active ISCR area. When the active area is along the outside edge of the resource area, the perimeter and observation wells are considered permanent installations; however, when the outer edge of the ISCR area is internal to the resource area, the installation of these wells is considered interim until the well field expands past the perimeter and observation wells based on the copper extraction sequence. In this case, the perimeter and observation wells convert to injection and recovery wells depending on the location in the well grid. When the well count for each period was calculated, the interim perimeter and observation wells were deducted from the total injection and recovery wells needed for that period since they were already installed. There are 206 permanent perimeter and 102 permanent observation wells projected for the ISCR area.

16.2.3 PLS Solution Flow Rates

PLS solution flow rates were predicted based on the physical parameters of each block scheduled for any given period. This was done using the thickness of oxide and the surface area of the block for determining the total linear feet of well screen and multiplying by 0.1 gpm per linear foot of well screen to calculate each blocks flow rate. For example, for a resource block that was 400 feet thick and had a surface area of 500 feet by 500 feet, the following flow rate was calculated:

- T = 400 feet of well screen per injection well;
- Number of injection wells = 25;
- Flow rate = 0.1 gpm per linear foot of well screen; and
- Block flow rate = T (400) times number of injection wells (25) times flow rate (0.1) or 1,000 gpm total from the block.

The flow rate from each block under leach is summed up for the respective production period and reported as flow to the SX Plant.

16.2.4 Hydraulic Control Solution Flow Rates

The hydraulic control flow, as mentioned above, is a critical permit condition and an important component of the Best Available Demonstrated Control Technology for the ISCR facility. Demonstration of hydraulic control is achieved by maintaining an inward gradient to the active ISCR area. This is accomplished through the use of perimeter and observation wells located along the outer edge of the active ISCR area. The predicted rate of flow required to maintain hydraulic control is 3% above the total flow injected into the ISCR area. For example, in period 1 the predicted injection flow rate and the recovery flow rate are both 2,402 gpm. To maintain hydraulic control, an additional 72 gpm (i.e., the hydraulic control flow rate) will be extracted from the perimeter wells. Additional hydraulic control pumping is required when injecting water to rinse the formation after leaching is complete in a resource block. For example, in period 5 the predicted injection and recovery flow rates are 6,634 gpm and the rinsing and recovery flow rates are 857 gpm resulting in a hydraulic control flow rate from the perimeter wells of 225 gpm.

16.2.5 Rinse Solution Flow Rates

Rinse solution is injected and recovered to return the formation to pre-leaching water quality conditions or Aquifer Water Quality Standards ("AWQS") as defined in the APP. The rinse solution is injected into the areas of the ISCR that have completed copper extraction as determined by PLS grade, a period currently projected to be four years. Therefore, rinse solution flows do not begin until period 5 in the extraction forecast, and will continue during the remainder of copper extraction operations. The rinse solution flow rate was designed to complete final rinsing within two years after commercial operations cease. To achieve this rinsing schedule, the rinsing simulation was developed to maintain consistent flow rates with variable sulfate concentrations to accommodate the water treatment system flow capacity. The rinse flow was calculated based on the number of pore volumes required to reach the water quality permit limits as determined by geochemical modeling.

The volume of rinse solution required to achieve the water quality objectives was determined by Schlumberger (Schlumberger, 2012). Schlumberger developed a geochemistry model in Geochemist Workbench that simulated solution chemistry during the rinsing period and predicted the number of pore volumes required to achieve the post rinsing water quality objectives. See section 20.1.5 for additional details on the geochemistry model and results.

The geochemistry model used sulfate as the indicator parameter for the rinsing simulation and a resulting sulfate to pore volume relationship was developed. This relationship, or sulfate degradation curve, was used to simulate formation rising following the copper extraction. The removal of sulfate during rinsing was simulated using the copper extraction model to predict solution flow rates and sulfate concentrations.

The rinsing simulation in the copper extraction model uses the 500 x 500 resource block data to establish the volume of water in each block based on 6% equivalent porous media porosity. The volume of solution and sulfate mass was determined for each block based on the Schlumberger study. The rinsing simulation used the solution volume and sulfate mass as the basis for removing sulfate in accordance with the sulfate degradation curve. Once the required volume of solution was removed from a block the wells in that block were scheduled for closure.

16.2.6 Abandonment/Closure of Coreholes and Miscellaneous Wells

There are approximately 322 pre-existing core holes, test wells, and other wells within the permit required 500-foot closure radius of the ISCR area. The core holes and wells are required to be abandoned in accordance with permit conditions prior to injection of fluids if they are within a 500-foot radius of the injection site. The reported number of core holes and wells scheduled for closure were determined using a GIS database compiled by Haley and Aldrich based on site records made available by past and present owners. This database was used to determine the 500-foot offsets of each period's production area based on the copper extraction forecast. The period in which the well counts within the block's 500-foot offset radius are shown in the copper extraction forecast is one period prior to the forecast of copper recovered from that block.

16.2.7 Mitigation of Cultural Sites

There are approximately 45 identified cultural sites identified by WCRM that will need mitigation prior to initiating ISCR activities in those areas. A site was included for mitigation when the 500-foot radius described above touched the site. The period in which the sites within the block's 500-foot offset radius are shown in the copper extraction forecast is two periods prior to the forecast of copper recovered from that block.

16.2.8 Limitations/Opportunities

The copper extraction forecast only considers the measured and indicated portion of the oxide deposit as defined by SRK. There is a small amount of sulfide material and inferred material within the area defined for leaching. No recovery of copper has been assumed on any material except that coded as oxide therefore it is likely that additional copper will be recovered during the leaching process. This material may also consume additional acid and currently acid consumption is only based on copper pounds produced and not tons of material in contact with solution.

The sweep efficiency used in the copper extraction forecast is very conservative as it relates to hydrologic contact of solution with the formation. The conservative factor includes the chemistry reaction related to copper dissolution; however the metallurgical testing suggests that the copper dissolution may be faster than is estimated with the current sweep efficiency factors. Data obtained during the PTF will confirm the sweep efficiency factor and may support increasing the factor.

Curis Arizona plans to use inflatable hydraulic packers within injection and recovery wells to selectively isolate portions of the formation for focused injection and recovery. The use of packers represents a change from the injection and recovery method used by BHP, and has the potential to facilitate prolonged solution contact with higher hydraulic conductivity portions of the formation, and forced recovery of solutions from portions of the formation that exhibit a lower hydraulic conductivity. Data generated by use of the packers during PTF operations will confirm the advantages of using such packers in this manner for commercial operations.

The rinsing process requires a significant volume of rinse water to be flushed through the formation to remove sulfate and other constituents. The rinsing assumptions include a water treatment process that allows for recirculation of solution to increase the rate of rinsing thus allowing the rinsing process to be completed within approximately two years of ceasing copper production in a resource block. The water treatment and recirculation of solution is not currently included in the APP; it will be included in the pending significant amendment application. A study is in progress to determine if any viable commercial products can be produced from the treatment process, i.e. commercial grade gypsum. It is possible that some of the water treatment costs could be offset if a viable commercial product can be produced.

The planned well spacing was derived from well performance and flow rate observations made during the BHP pilot field test conducted in 1997-1998. The well spacing and planned rates are similar to the values used by BHP during their field pilot test. During PTF operations, Curis Arizona will use the packer assemblies described above to test the flow capacity of discrete portions of the formation. If during PTF operations the wells are able to sustain higher flow rates than those observed by BHP and maintain an acceptable solution grade while doing so, the well spacing and flow rates may be able to be increased. Increased well spacing will result in fewer wells installed to fully develop the deposit, with a net positive impact on capital costs.

17 RECOVERY METHODS

The FCP utilizes solvent extraction (SX) and electrowinning (EW) to recover copper from the solutions pumped from the in-situ copper recovery (ISCR) well field. The SX/EW plant is designed to handle a nominal flow of 7,400 gallons per minute ("gpm") with a copper concentration of 1.8 grams per liter ("g/L"). After five years, the SX/EW plant will be expanded to handle a flow of 11,000 gpm. The processing plant is in the northeast corner of the State Land parcel. The process fluids are piped to and from the process plant in lined trenches.

The process will consist of the following elements:

1. ISCR well field;
2. Lined pregnant leach solution (PLS) and raffinate ponds;
3. SX Plant with three mixer settlers, increasing to four in Year 5;
4. Tank Farm for handling process liquids;
5. EW Tankhouse;
6. Ancillary warehouse and maintenance facilities;
7. Water treatment plant and water impoundment facilities; and
8. Existing Administration office complex near the eastern side of the site.

17.1 IN-SITU COPPER RECOVERY WELL FIELD

The source of copper for this process is an oxidized copper mineralized body that is covered by 370 to 410 feet of alluvial sediments. The ISCR process involves injecting acidified leach solution in a series of wells and extracting PLS from the subsurface and pumping it to the PLS pond.

Rows of injection wells set on 100-foot centers are flanked on both sides by rows of extraction wells set on 100-foot centers with a 50-foot offset resulting in a 71-foot spacing between an injection well and adjacent extraction wells. Leach solution is delivered to the oxide zone at a nominal rate of 50 gpm at a maximum pressure of 0.65 pounds per square inch per foot (psi/ft) of depth below land surface. Leach solution is extracted from recovery wells at the nominal rate of 50 gpm by electric submersible pumps. Flows are balanced so that injection and recovery are balanced, producing an aggregate flow to and from the processing plant of approximately 7,400 gpm initially, increasing to 11,000 gpm in Year 5.

Leach solution is delivered to injection wells and extracted from recovery wells through a network of piping composed of high density polyethylene (HDPE) (Figure 17-1). The main lines to and from the well field are 30 inches in diameter, branching to 24-inch trunk lines and 10-inch arterials. Pairs of 6-inch header pipe form a corridor between every other row of injection and recovery wells. Individual wells are connected to either the leach solution line (injection) or PLS line (recovery) with 2-inch HDPE. Each wellhead is equipped with valves and a flow meter to control the flow in or out of the well. Approximately 10 wells are attached to each of the 6-inch header pipes. Alternate corridors between wells are used for vehicle traffic and access to the wells for sampling and maintenance.

Extraction and injection wells have the same design and are interchangeable so that the flow can be reversed by re-equipping and re-piping the wells. Wells penetrate the alluvial aquifer and are securely sealed off through this zone to prevent leakage of process solutions into the aquifer. In addition, the top 40 feet of the oxide mineralized body is sealed off, forming an exclusion zone. This exclusion zone is intended to mitigate potential leakage upward into the alluvial aquifer system. Sealing the well from the surface to the bottom of the exclusion zone is accomplished by installing 6-inch diameter fiberglass reinforced (FRP) well casing through this zone and filling the annular space from the outside of the pipe to the inside of the 12-inch diameter borehole with Type V neat cement grout. The grout is emplaced through a tremie pipe from the bottom to the surface to ensure that there are no gaps in the seal.

Slotted well screen is installed below the exclusion zone in three sections to enable zoned leaching of the oxide mineralized body. Casing below the exclusion zone is composed of 6-inch diameter Schedule 80 polyvinyl chloride (PVC) with a threaded adapter to connect with the FRP casing. The PVC casing consists of three approximately equal sections of factory-slotted well screen with 0.080-inch openings. Sections of screen are separated by approximately 20 feet of blank PVC casing. Annular space in the screened sections is filled with silica sand filter pack to remove particulates from the formation and promote flow from the formation to the well screen openings. The blank sections between screened intervals are sealed with at least 10 feet of Type V neat cement grout to prevent flow from one screened section to another.

Recovery wells are equipped with electric submersible pumps with packer assembly to enable pumping from a discrete depth interval in the well. Adjacent injection wells are also equipped with packers to inject the leaching solution into the depth interval that is complementary to the adjacent well's extraction interval. The zoned flow scheme is intended to maximize the horizontal flow in the mineralized body and provide the most efficient and rapid sweeping of the zone being leached.

Lines of injection wells alternate with lines of extraction wells to create a balanced flow into and out of the portion of the mineralized body being leached. Aggregate injected flow is balanced by aggregate extraction flow to create a flow balance that limits the migration of solutions out of the mineralized material body portion that is under leach. This flow balance also facilitates flow through the process plant with minimal need for adjustment. Extraction wells must be present on the periphery of the portion under leach to maintain control of the solutions. There will always be more extraction wells in operation than injection wells, requiring peripheral extraction wells to have somewhat lower flow to maintain the flow balance. Hydraulic control wells are located outside of the periphery of the portion under leach to ensure that the groundwater flow is inward in every location and maintain hydraulic control of the process solutions.

17.2 PROCESS PONDS

The PLS and raffinate ponds are on the west side of the plant site nearest to the well field (Figure 17-2). The raffinate pond has a double geomembrane liner system consisting of compacted subgrade soil, a 60 mil HDPE secondary liner, a geonet drainage layer and a primary liner of HDPE. It has a design capacity of 6,480,000 gallons, which provides a 14.6-hour residence time at 7,400 gpm and 9.8-hour residence time at the ultimate design flow rate of 11,000 gpm. The raffinate pond receives acidified discharge from the in-line static mixers south of the pond downstream from the coalescers and the SX Plant. The raffinate pond is equipped with two vertical turbine pumps and one spare with 360 feet of total dynamic head to deliver the 7,400 gpm flow rate to the well field with enough pressure to enable injection of leach solution to the injection well field. In Year 5, a third vertical turbine pump will be added to increase the capacity to 11,000 gpm to the well field.

The PLS pond is adjacent to the raffinate pond (west) and is constructed with the same design as the raffinate pond (Figure 17-2). The PLS pond has a double geomembrane liner system consisting of compacted subgrade soil, a 60 mil HDPE secondary liner, a geonet drainage layer, and a primary liner of HDPE. The design capacity of 6,480,000 gallons provides a 14.6-hour residence time at 7,400 gpm and 9.8-hour residence time at the ultimate design flow rate of 11,000 gpm. The pond is equipped with two vertical turbine pumps and one spare to deliver PLS to the SX Plant. In Year 5, a third vertical turbine pump will be added to increase the capacity to 11,000 gpm to the SX Plant.

17.3 SOLVENT EXTRACTION PLANT

The SX Plant is located east of the raffinate pond (Figure 17-2) and consists of three reverse-flow mixer-settlers in a parallel configuration. A fourth mixer settler is added in Year 5 with conversion to a series-parallel configuration, increasing the capacity of the plant. In the extraction stages, an organic solution with a copper-specific extractant is mixed with PLS to extract copper from the solution. The organic and aqueous solutions are allowed to separate in the settlers. In the stripping stage, copper is stripped from the organic solution and transferred to the electrolyte solution. Organic stripped of its copper load circulates back through the extraction mixer-settlers, progressively loading it with copper as it flows through the extraction train, removing 90% of the copper load.

The extraction units consist of primary, secondary, and tertiary mix tanks that thoroughly combine the organic and PLS. The contact time facilitates transfer from the PLS solution to the extractant in the organic. The settlers are 67 feet wide, 102 feet long and 4 feet deep. The reverse-flow settlers direct the mixed solutions along the side of the settlers and through turning vanes that direct the separating solutions to flow back toward the mixers where the solutions are separated.

In parallel configuration, the PLS flow stream is split between two extraction mixers, each receiving half of the flow. In series-parallel configuration half of the solution takes two passes through the organic solution (E1 and E2), and the other half of the solution taking one pass through the organic solution (E1-P). The stripped organic solution is progressively loaded passing through E-2, E1-P, and E-1 before returning to the strip settler (S-1) via the loaded organic tank.

Loaded organic is stripped of its copper by the strongly acidified lean electrolyte in the strip settler (S-1). There are two (primary and secondary) mix tanks that provide the contact between the lean electrolyte and loaded organic. The solutions are separated in the settler, configured the same as the extraction settlers, with the stripped organic solution routed to extraction mixer settler (E-2), and the rich electrolyte solution routed through the Tank Farm to EW filters in the Tank Farm.

17.4 TANK FARM

The Tank Farm is located south of the SX Plant (Figure 17-2) and at lower elevation to enable solutions to flow into the tanks by gravity. The Tank Farm holds process tanks, filters, pumps, and heat exchangers associated with the SX/EW process. Solutions are pumped from the Tank Farm to the respective process areas to maintain the process flow. The Tank Farm is located in secondary containment in accordance with BADCT standards.

Primary process equipment located in the Tank Farm includes filters and heat exchanger. Rich electrolyte is filtered to remove solids and organics. The rich electrolyte flows by gravity from the S1 settler to the electrolyte filter feed tank. The rich electrolyte is pumped through the electrolyte filters. Filtered electrolyte is then pumped through a heat exchanger to transfer heat from the lean electrolyte to the rich electrolyte, and then on to the electrolyte recirculating tank.

A system is installed in the Tank Farm to process crud from solvent extraction. Crud is the material which accumulates at the organic/aqueous interface in the SX settlers. This material is treated to recover the valuable organics. The crud is removed from the settlers via an air-operated pump and transferred to a crud decant tank. The crud is allowed to settle in the decant tank. If required, clay can be added to remove impurities in the organic. The upper organic in the decant tank is recovered and sent to the loaded organic tank. The sediment at the bottom of the tank is pumped thru a filter and the filter cake removed.

17.5 ELECTROWINNING PLANT

The EW Tankhouse is located south of the Tank Farm and the SX Plant (Figure 17-2). The EW plant will utilize permanent cathode technology initially with 74 cells, increasing to 100 cells in Year 5, each containing 67 lead anodes and 66 stainless steel “mother” cathodes. Located on the south end of the Tankhouse building is the cathode washing and stripping machine.

The EW Tankhouse cells are arranged in two parallel banks of 37 (50) cells each. In the hydraulic circuit, all cells are arranged in parallel allowing each cell to have the same feed solution and discharge solution. Electrically, the cells are connected in series.

Direct electrical current is supplied by two rectifiers. Current flows from the rectifiers through a bus bar to the bank of cells. Each cell is equipped with intracell bus bars, 66 cathode plates and 67 anode plates arranged in parallel. Within each bank, direct electrical current flows from a bus bar to the anode and then through the electrolyte to the cathode plates. An intercell bus bar provides current to the next cell successively and finally returns to the rectifiers.

Heated, filtered, rich electrolyte flows from the Tank Farm heat exchangers into the electrolyte recirculation tank where it mixes with overflow from the lean electrolyte tank. The solution from this tank is pumped to the Tankhouse cells where copper in solution is plated onto the cathode plates.

As a result of the electrochemical reaction at the anode, oxygen evolves from the EW cells creating a mist. The EW cells are covered to contain the mist and a surfactant is used to reduce the quantity of mist produced. Cobalt sulfate is also added to passivize the anode, and guar (a bean powder) is added as a surface modifier for the cathode.

Copper is plated onto stainless steel cathode blanks over a cycle of approximately 7 days. A portion (about one fifth) of the cathodes is harvested daily. A special lifting bale is used to lift every third cathode from a cell in a single lift of 22 cathodes. Three separate lifts will be required to harvest one complete cell. The cathodes are carried by the Tankhouse Crane to an automatic stripping machine and placed on the receiving conveyor. From there the cathodes pass through a wash chamber and are washed with hot, high pressure water to remove the copper bearing electrolyte and any particulates.

From the wash chamber, cathodes are moved to a stripping location where the copper sheets are removed mechanically from each side of the stainless steel blanks and the blanks are then placed on a discharge conveyor and carried back to a cell and put back into operation. To minimize the time that a particular cell is without one set of cathodes, a spare set of stripped cathode blanks needs to be available so that when plated cathodes are removed and placed on the receiving conveyor, a clean set of stripped cathodes can be immediately placed back into the cell. When the washed cathodes are then stripped, a new set of plated cathodes can be removed and replaced with stripped blanks and the process repeated. To maintain the 7 day plating cycle, twenty cells need to be stripped each day for 5 days leaving the weekend for maintenance and “catch up” if needed.

After stripping, the copper sheets are weighed, sampled, bundled, and strapped. Road access should be maintained for a forklift to assist with materials handling in this area, such as loading cathode for shipment. Space has been allocated for storage of at least 7 days of cathode production.

The major components of the electro-winning process are listed below and a graphical description of the process is shown in drawing 600-FS-001 (Figure 17-5).

- Electrolyte circulation tank
- Rectifiers
- EW cells
- Anodes and cathodes
- Cathode washing and stripping machine
- Overhead bridge crane
- EW cell ventilation system
- Utilities
- Shorting frame
- Anode/cathode refurbishment area

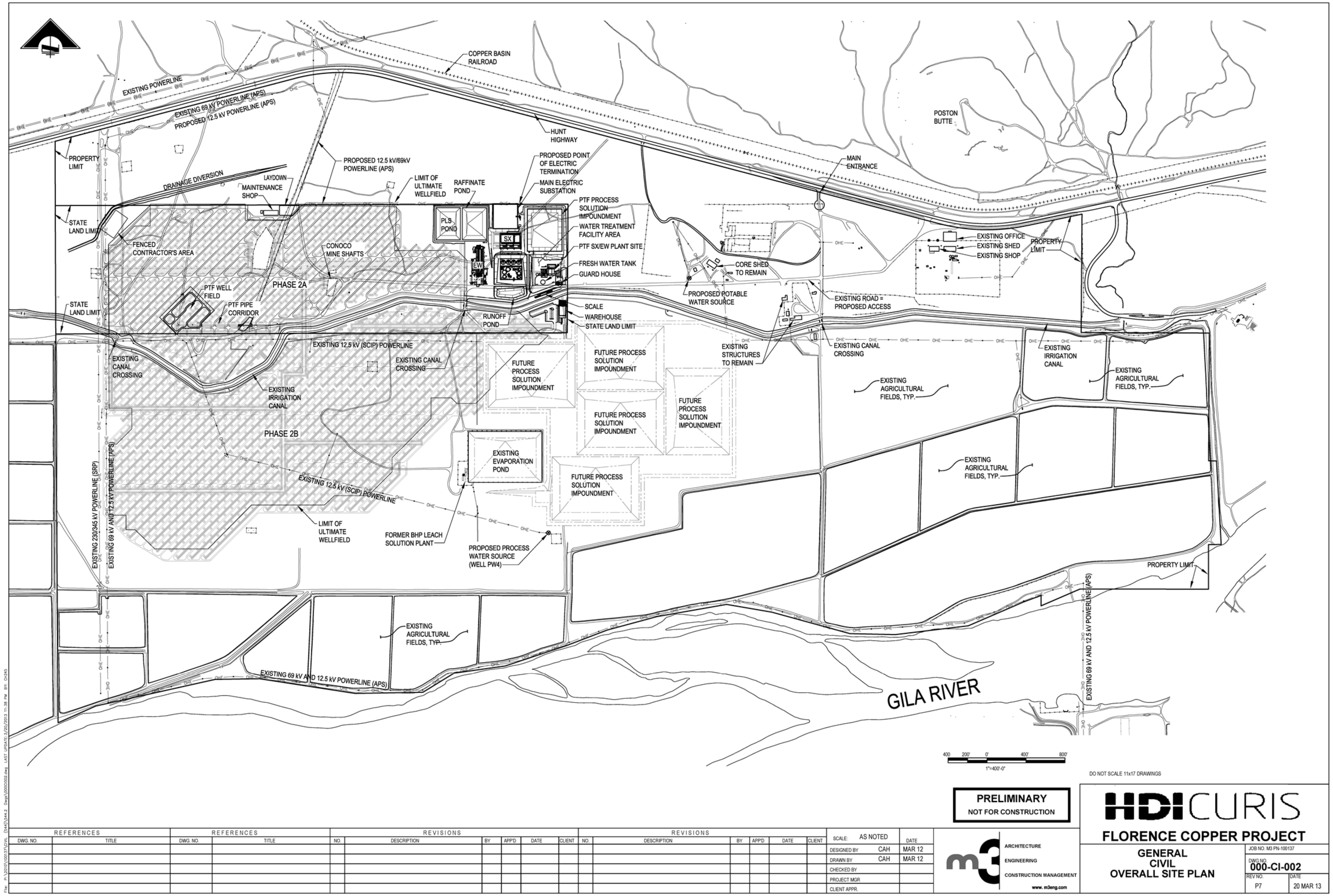


Figure 17-1: General Site Plan

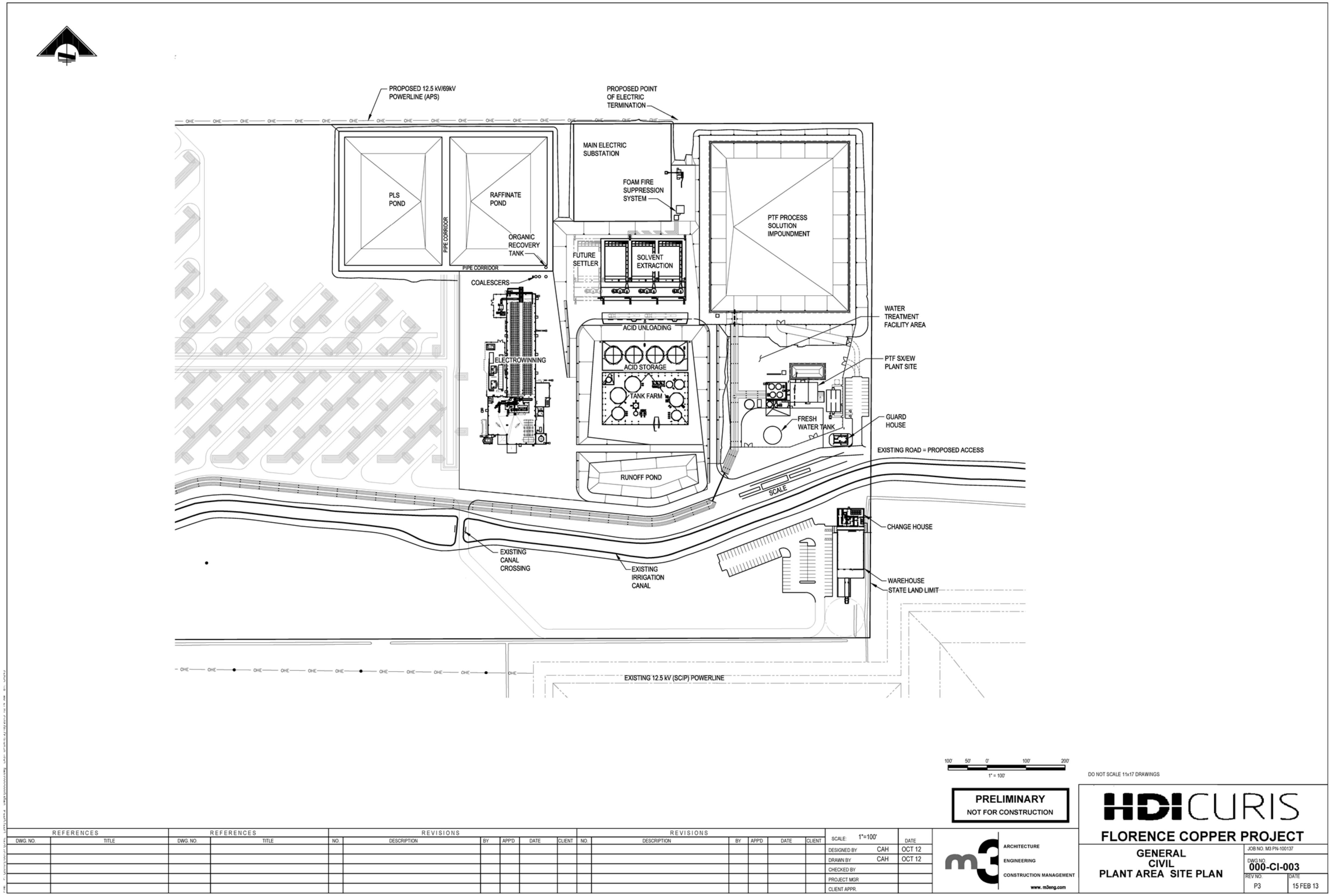
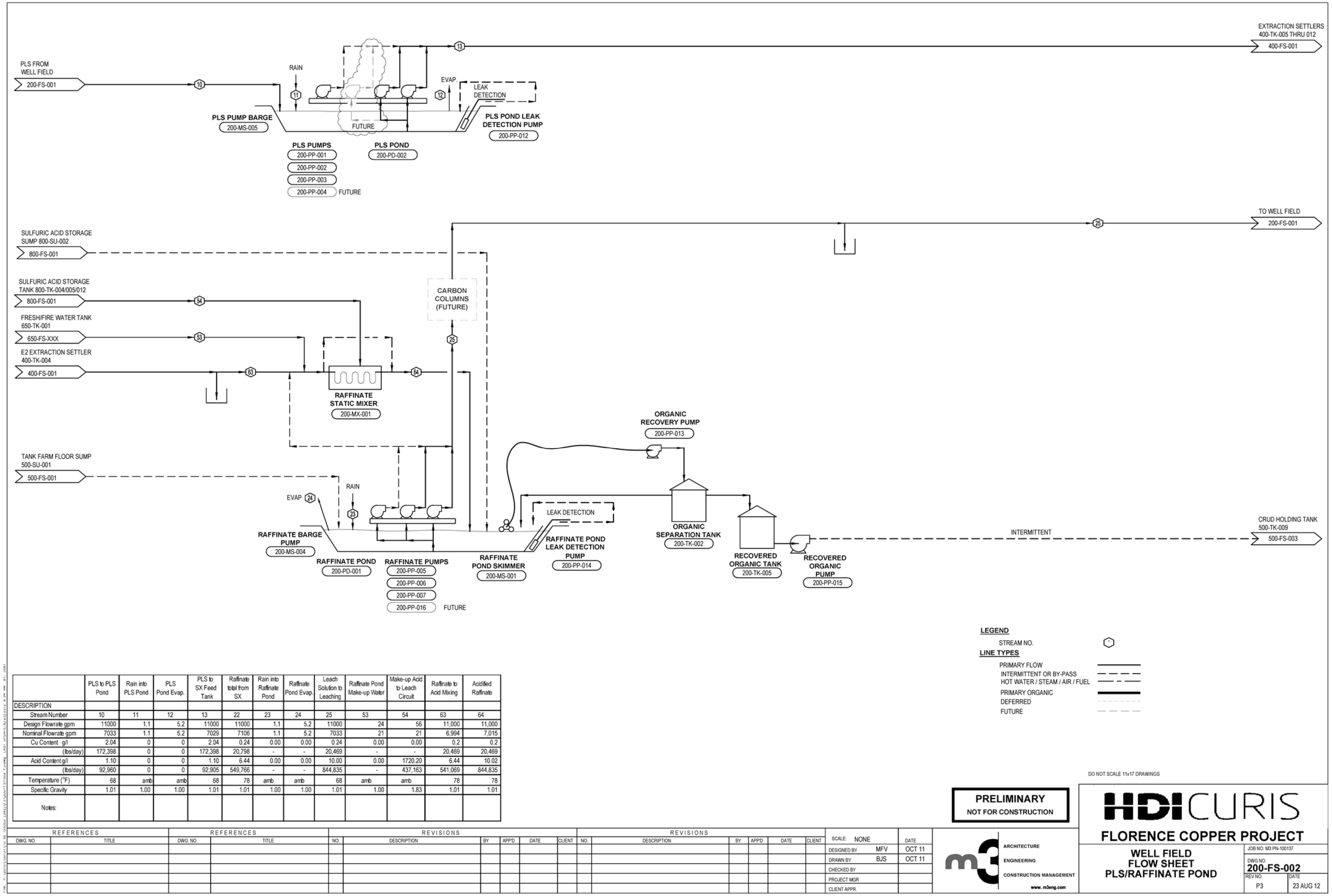
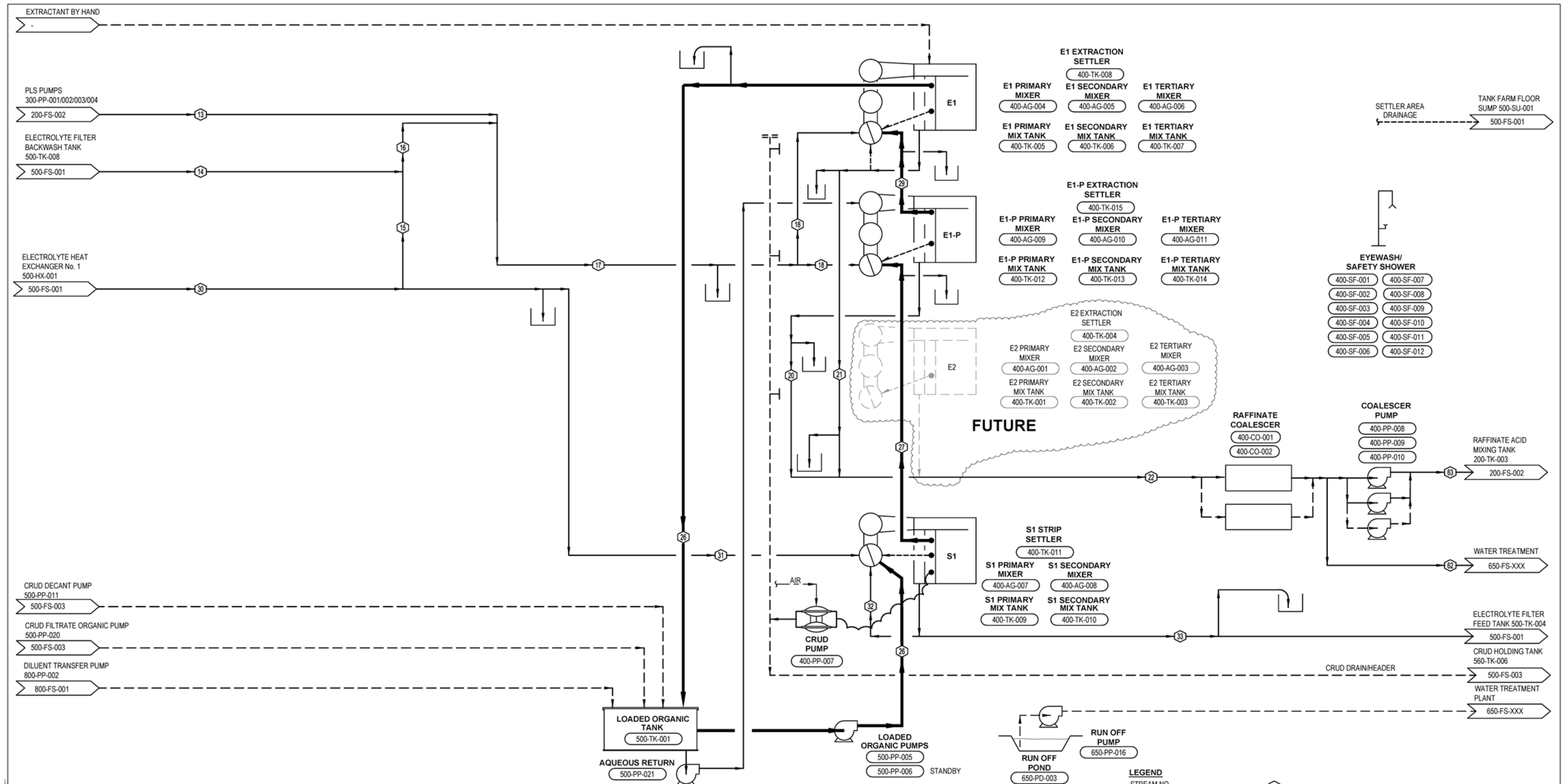


Figure 17-2: Plant Area Site Plan



	PLS to PLS Pond	Rain into PLS Pond	PLS Pond Evap.	PLS to SX Feed Tank	Raffinate total from SX	Rain into Raffinate Pond	Raffinate Pond Evap.	Leach Solution to Leaching	Raffinate Pond Make-up Water	Make-up Acid to Leach Circuit	Raffinate to Acid Mixing	Acidified Raffinate
DESCRIPTION												
Stream Number	10	11	12	13	22	23	24	25	53	54	63	64
Design Flowrate gpm	11000	1.1	5.2	11000	11000	1.1	5.2	11000	24	56	11,000	11,000
Nominal Flowrate gpm	7033	1.1	5.2	7029	7106	1.1	5.2	7033	21	21	6,994	7,015
Cu Content g/l	2.04	0	0	2.04	0.24	0.00	0.00	0.24	0.00	0.00	0.2	0.2
(lbs/day)	172,398	0	0	172,398	20,798	-	-	20,469	-	-	20,469	20,469
Acid Content g/l	1.10	0	0	1.10	6.44	0.00	0.00	10.00	0.00	1720.20	6.44	10.02
(lbs/day)	92,960	0	0	92,905	549,766	-	-	844,835	-	437,163	541,069	844,835
Temperature (°F)	68	amb	amb	68	78	amb	amb	68	amb	amb	78	78
Specific Gravity	1.01	1.00	1.00	1.01	1.01	1.00	1.00	1.01	1.00	1.83	1.01	1.01
Notes:												

Figure 17-3: Flowsheet, PLS/Raffinate Pond



	PLS to SX Feed Tank	Backwash Bleed	Bleed From EW	Total Electrolyte Bleed	SX Feed Total	SX Feed per stream	Raffinate per train series	Raffinate per train parallel	Raffinate total from SX	Loaded Organic	Stripped Organic	E-1P Organic Advance	Lean Electrolyte total	Lean Electrolyte to S-1	S-1 Aqueous Recycle	Rich Electrolyte total	Raffinate Bleed	Raffinate to Acid Mixing
DESCRIPTION																		
Stream Number	13	14	15	16	17	18	20	21	22	26	27	29	30	31	32	33	62	63
Design Flowrate gpm	11000	89	0	89	11000	5500	5500	5500	11000	5500	5500	5500	1500	1500	4500	1500	129	11,000
Nominal Flowrate gpm	7029	77	0	77	7106	3553	3553	3553	7106	3553	3553	3553	1013	1013	2540	1013	112	6,994
Cu Content g/l	2.04	34.59	35.00	34.59	2.44	2.44	0.19	0.29	0.24	4.89	0.50	2.64	34.59	34.59	50.00	50.00	0.2	0.2
(lbs/day)	172,398	32,028	-	32,028	207,984	103,992	8,319	12,479	20,798	208,648	21,134	112,647	420,905	420,905	1,526,207	608,420	329	20,469
Acid Content g/l	1.10	180.00	180.00	180.00	3.04	3.04	10.02	10.02	6.44	0.00	0.00	0.00	180.00	180.00	156.11	156.11	6.44	6.44
(lbs/day)	92,905	166,668	-	166,668	259,627	129,814	427,913	427,913	549,766	-	-	-	2,190,311	2,190,311	4,765,261	1,899,663	8,696	541,069
Temperature (°F)	68	113	113	113	68	68	84	72	78	69	85	73	104	104	85	85	78	78
Specific Gravity	1.01	1.17	1.17	1.17	1.01	1.01	1.01	1.01	1.01	0.83	0.83	0.83	1.17	1.17	1.19	1.19	1.01	1.01
Notes:										% Extractant = 20.9 % Diluent = 79.1								

REFERENCES: DWG. NO. | TITLE
REVISIONS: NO. | DESCRIPTION | BY | APP'D | DATE | CLIENT

SCALE: NONE
DESIGNED BY: MFV — DATE: OCT 11
DRAWN BY: BJS — OCT 11
CHECKED BY
PROJECT MGR
CLIENT APPR.

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MIXER/SETTLERS
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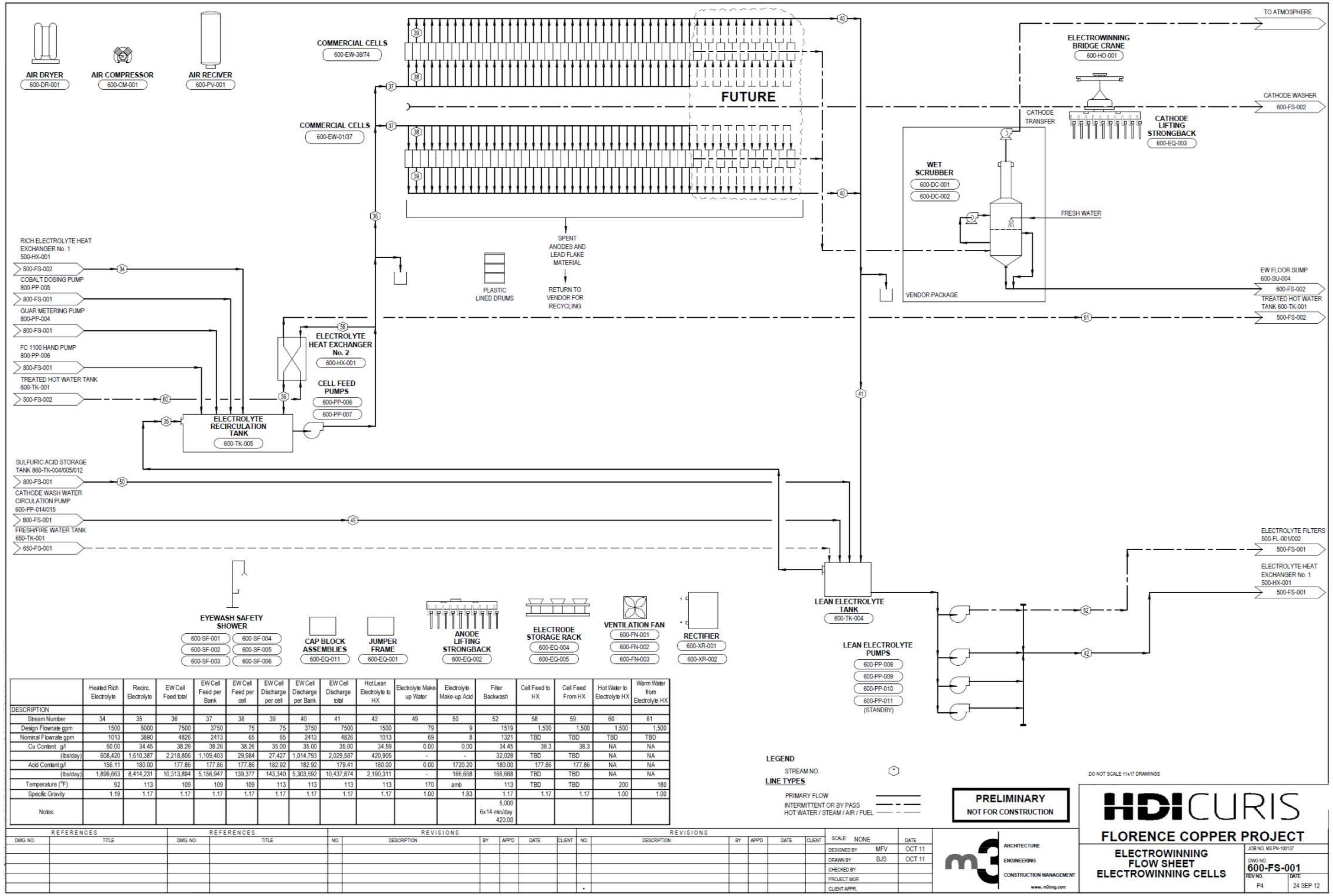
DWG NO. 400-FS-001
REV NO. P3
DATE 23 AUG 12

Figure 17-4: Flowsheet, Mixer/Settlers



	Heated Rich Electrolyte	Recirc. Electrolyte	EW Cell Feed total	EW Cell Feed per Bank	EW Cell Feed per cell	EW Cell Discharge per cell	EW Cell Discharge per Bank	EW Cell Discharge total	Hot Lean Electrolyte to HX	Electrolyte Make-up Water	Electrolyte Make-up Acid	Filter Backwash	Cell Feed to HX	Cell Feed From HX	Hot Water to Electrolyte HX	Warm Water from Electrolyte HX
DESCRIPTION																
Stream Number	34	35	36	37	38	39	40	41	42	49	50	52	58	59	60	61
Design Flowrate gpm	1500	6000	7500	3750	75	75	3750	7500	1500	79	9	1519	1,500	1,500	1,500	1,500
Nominal Flowrate gpm	1013	3890	4826	2413	65	65	2413	4826	1013	69	8	1321	TBD	TBD	TBD	TBD
Cu Content g/l	50.00	34.45	38.26	38.26	38.26	35.00	35.00	35.00	34.59	0.00	0.00	34.45	38.3	38.3	NA	NA
(lbs/day)	608,420	1,610,387	2,218,806	1,109,403	29,984	27,427	1,014,793	2,029,587	420,905	-	-	32,028	TBD	TBD	NA	NA
Acid Content g/l	156.11	180.00	177.86	177.86	177.86	182.92	182.92	179.41	180.00	0.00	1720.20	180.00	177.86	177.86	NA	NA
(lbs/day)	1,899,663	8,414,231	10,313,894	5,156,947	139,377	143,340	5,303,592	10,437,874	2,190,311	-	166,668	166,668	TBD	TBD	NA	NA
Temperature (°F)	92	113	109	109	109	113	113	113	113	170	amb	113	TBD	TBD	200	180
Specific Gravity	1.19	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.00	1.83	1.17	1.17	1.17	1.00	1.00
Notes:												5,000 6x14 min/day 420.00				

Figure 17-5: Flowsheet, Electrowinning Cells

18 PROJECT INFRASTRUCTURE

The FCP is located within the town of Florence, Arizona on the north bank of the Gila River (see Figure 17-1). The site is accessed by the Hunt Highway that lies along the north boundary of the project site. The Copper Basin Railway lies just north of the Hunt Highway. A regional power transmission corridor is present near the western boundary of the site and includes an Arizona Public Service ("APS") transmission line that provides power for the operation. Potable water will be provided from water supply wells onsite and natural gas is available approximately 6,000 feet east of the property. Operation of the in-situ copper recovery ("ISCR") well field requires pumping more water from the formation than is injected as leach solution to provide hydraulic control. A water treatment plant will be installed to neutralize excess water from the operation and deposition of the solids and mechanical evaporation of the excess liquid.

18.1 ACCESS

Access to the property is from Hunt Highway, approximately 2.1 miles west of U.S. Highway 79 north of Florence, Arizona. Hunt Highway is presently a two-lane highway, but the Town has plans to upgrade it to a divided highway. Road improvements including adding a left turn lanes for westbound traffic are necessary during the development of the property for safe handling of traffic in and out of the property. The Copper Basin Railroad is located just north of Hunt Highway. There is a siding less than a mile east of the property that could be used to ship and take deliveries.

18.2 POWER

Power for the site is available from a major power transmission corridor on the west side of the property. The project site is served by APS, which has a 69 kilovolt (kV) transmission line available for use at the northwest corner of the project. APS is building a transmission line the remaining ½ mile to the site of the proposed substation. APS will provide the transformer for the substation and provide power at a primary voltage rate. APS will be responsible for providing a portable transformer if the installed transformer fails, eliminating the need for Curis to install a redundant spare.

18.3 WATER

Potable water will be provided from an onsite water supply well for consumptive drinking, safety showers, lavatory, and toilet facilities. The existing well will be equipped with a water treatment system and the water will be piped to a holding tank in the plant area. Process and fire suppression water are provided by an existing water supply well on the site. A pipeline will be constructed from the existing well to a process/firewater storage tank at the plant site. Sanitary disposal services are provided by an existing septic system for the administration building. Septic systems for the warehouse, gatehouse, Tankhouse, and well field maintenance building will be include holding tanks that will be pumped out on a regular basis.

18.4 NATURAL GAS

Natural gas will be used to power a water heater located near the Tankhouse. Heated water will be used, as necessary in the process. A 4-inch line is available on Poston Butte Loop, approximately 6,000 feet to the east. Southwest Gas has provided a proposal to bring a 4-inch main to the property entrance and a 2-inch line to the plant site.

18.5 WATER TREATMENT PLANT

The ISCR process produces excess water that must be treated for reuse or evaporation for this zero-discharge facility. The water comes from four primary sources: groundwater pumping to maintain hydraulic control, excess process water (raffinate), cathode wash and wash-down water, and water used to rinse the portions of the formation that have been depleted of soluble copper. Much of this water is acidic (low pH) and requires neutralization.

A water treatment plant has been designed conceptually by ARCADIS to neutralize, filter, and purify the water using reverse osmosis (RO) technology. The water treatment system will be built in stages as water treatment needs change over the life of the project. Details concerning the water treatment system are presented in Section 20.2.

19 MARKET STUDIES AND CONTRACTS

19.1 MARKET STUDIES

19.1.1 Sulfuric Acid

Curis Arizona commissioned a study of future sulfuric acid availability and pricing to be completed by Elkbury Sulphur Consultants, Inc. (Elkbury), a consulting company dedicated to the sulfur and sulfuric acid industries, and the markets they serve. The study analyzed the results of a Request for Proposal (RFP) issued by Curis Arizona to five acid vendors located in the southwestern United States. The RFP requested pricing for acid to be supplied beginning in the year 2014, based on fourth quarter 2012 forecast prices.

Three of the five acid vendors responded with proposals to provide a consistent supply of acid from both domestic and overseas sources. The most economical proposals included acid provided from sources in Arizona and Utah. Proposals included acid supplies sourced from multiple domestic and overseas locations, ensuring continual availability of acid to support in-situ copper recovery (ISCR) operations. Acid supply proposals included transportation by both rail and truck, with transloading from rail to truck as required.

The forecast acid prices are subject to some variability based on acid availability and fluctuation in transportation costs. However, the study estimated that sufficient quantities of acid are available from multiple acid vendors at forecast prices ranging between $100 to $160 per ton, delivered. Based on this study, Curis Arizona has selected a long-term acid price of $120 per ton for use in the Pre-Feasibility and feasibility studies.

19.1.2 Electric Power

ISCR requires the operation of electric pumps to push the raffinate to the injection wells and electric well pumps to lift the pregnant leach solution (PLS) out of the recovery wells and push it to the SX/EW plant. Curis Arizona commissioned a study by P&R Consulting LLP (P&R) of the availability and pricing of electrical power to meet power demand for the life of the project. The project is expected to have a peak electric load of 18.1 megawatts (MW) (P&R, 2011). As described in Section 21 of this document, the average power consumption over the life of the project is estimated to be 9.8 MW, and as high as 12.0 MW when the project is producing 85.5 million pounds of copper per year. The project is located within the Arizona Public Service Company (APS) service area established by the Arizona Corporation Commission. Although several smaller dedicated power utilities have distribution networks in the vicinity of the project, those distribution networks are not available for use by the project. APS will be the project power provider.

APS owns ten generating stations within the State of Arizona, with a combined generating capacity of more than 10,000 MW. APS also has power purchase agreements with independent power providers within the State. APS has sufficient power generation capacity and an extensive distribution network capable of supplying the estimated peak load of 18.1 MW and the sustained maximum load of 12 MW electrical energy needs for the life of the project. Electrical energy costs for the life of the project were estimated to be $0.0839 per kilowatt hour (/kWh) for the first year of the project and $0.0692/kwh for years 2-20 (P&R, 2011). This energy pricing has been extended to cover years 2 through 27, the entire life of the project.

19.2 CONTRACTS

Curis Arizona is a guarantor for its parent company, Curis Resources Ltd., and has placed 25% of its copper cathode production over the life of the project under an off-take agreement with Red Kite Mine Finance Trust I. The agreement includes market pricing and optional extension. If the extension option is exercised, the percentage of copper cathode included in the sale rises from 25% to 30%. The off-take agreement is linked to a bridge loan and security agreement.

All non-committed copper cathode not included in the Red Kite Copper Cathode Sale and Purchase Agreement, will be sold in the open market, or subject to off-take arrangements yet to be negotiated.

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 ENVIRONMENTAL STUDIES

Numerous environmental studies have been completed at the project site. The studies include a jurisdictional water review, archeological investigations, wildlife and threatened and endangered ("T&E") species investigations, groundwater monitoring, groundwater geochemical modeling, groundwater flow modeling, and a hydraulic control and rinsing test. The results of the studies have been incorporated into operations and closure aspects of the project and included in the capital and operating costs areas as appropriate.

20.1.1 Jurisdictional Water Review

Westland Resources, Inc. ("Westland") was retained by Curis Arizona to review the project site for potential jurisdictional waters as defined by Section 404 of the Clean Water Act. The review is essentially an update of an earlier study prepared in the 1990s for Magma/BHP. In summary, Westland concluded that potential jurisdictional waters exist at one small, unnamed wash on the east side of the project site. Curis Arizona has designed the project to avoid disturbance of the potential jurisdictional waters identified by Westland.

20.1.2 Archeological Investigations

Western Cultural Resource Management ("WCRM") was retained by Curis Arizona to update the cultural resource inventory for the project site and to assist in preparing the programmatic agreement to support the Underground Injection Control ("UIC") Permit. The Curis Arizona Area of Potential Effects ("APE") has been the subject of numerous investigations for nearly a century. Past projects have documented a total of 59 sites; of these, 42 have been determined eligible for inclusion in the National Register; effects at two were mitigated in 1997; eight have been determined not eligible; and seven are of undetermined eligibility. WCRM prepared the original cultural resource inventory for Magma/BHP in 1994-95 for the project site.

Of the various efforts, most sites were documented by WCRM in 1994-1995 during its intensive inventory for Magma Copper (Brown and Van Dyke, 1995). WCRM then undertook a series of testing and data recovery projects prior to the shutdown of BHP's Florence project in 1998. The largest sites, however, were subject to intensive excavations much earlier (in the 1970s) at the time of Conoco's original attempt to mine copper within the property. This work included excavations at Escalante Ruin and a series of other large habitation sites (compounds) on the first terrace above the floodplain (Doyel, 1975/1977; Doelle, 1974/ 1975/1976; Windmiller, 1972). Most recent work within the APE include a Class I inventory and a series of site revisits in 2005-2006 in association with the proposed Vanguard Properties Merrill Ranch housing development; revisits by WCRM in 2011 exclusive to the sites located on ASLD lands; and monitoring by WCRM of limited ground disturbing activities on private and ASLD lands for the current Curis Arizona project activities.

20.1.3 Wildlife and Threatened & Endangered Species Investigations

Curis Arizona hired Westland to prepare a biological evaluation ("BE") of the project site. The BE encompassed approximately 620 acres (Project Area), which includes the 160-acre Arizona State Land parcel. The purpose of the BE was to determine the potential for the Project Area to support any special status species. The list of special status species included those species in Pinal County that are listed (threatened and endangered) under the Endangered Species Act ("ESA") by the United States Fish and Wildlife Service ("USFWS") and species recognized by the USFWS as proposed or candidates for listing under the ESA, or with an existing conservation agreement with the USFWS.

The field reconnaissance for the BE was conducted in December 2010 and January 2011, and the BE report was issued in March 2011 (Westland, 2011).

The results of the study indicate there are no T&E species on or near the Project Area and the Project Area is not located within any designated or proposed critical habitat. There is potential for two candidate species, the Sonoran Desert Tortoise and the Tucson shovel-nosed snake, to occur at the site even though the habitat in the Project Area is not considered ideal. One species proposed for listing, the mountain plover, has the potential to occur at the Project Area during its non-breeding season. One species protected under the Migratory Bird Treaty Act but not listed in the ESA, the western burrowing owl, also has the potential to occur at the Project Area.

Although the report did not include recommendations, Curis Arizona has proposed the use of tortoise fencing in sensitive areas such as around the water impoundments and processing area.

20.1.4 Groundwater Quality Sampling and Analyses

An extensive groundwater characterization program was conducted as part of the permit application processes required by regulations of the ADEQ and the United States Environmental Protection Agency (USEPA). Data from the program were used in groundwater flow and transport models to evaluate proposed in-situ copper recovery (ISCR) operations and to establish 12-month baselines to serve as the statistical foundation for alert levels (ALs) and Aquifer Quality Limits (AQLs) at 31 point of compliance (POC) wells. The ALs and AQLs were to be used in the compliance monitoring program that would be required as conditions of the Aquifer Protection Permit (APP) and the UIC Permit, issued respectively by ADEQ and USEPA.

The groundwater characterization samples were collected and analyzed in accordance with procedures specified in a work plan approved by ADEQ and USEPA. Specifically, trained personnel of an environmental consulting firm collected the samples, applied appropriate labels, and transported the samples with properly completed chains of custody to laboratories licensed in accordance with Arizona law to perform the analyses specified in the work plan. The laboratory data were reviewed and entered into a database in accordance with the approved work plan and then used to develop ALs and AQLs approved by ADEQ and USEPA.

After the APP and UIC Permit were issued in June 1997, a compliance monitoring program involving the POC wells was initiated in accordance with requirements specified in the APP and UIC Permit. The program involves the analysis of seven parameters per well each quarter and the analysis of 41 parameters per well biennially. Samples continue to be collected and analyzed quarterly and compared to ALs and AQLs specified in the APP and the UIC Permit. Reports of sampling and analytical results are submitted quarterly to ADEQ and USEPA. Specifically, trained personnel of an environmental consulting firm collect all samples, label them, and transport them with appropriate chains of custody to laboratories licensed in accordance with Arizona state law to perform the analyses required by the permits. The environmental consulting firm maintains a database of all groundwater quality data collected under the initial characterization program and the subsequent compliance monitoring program.

Water quality samples related to the BHP field test consisted of groundwater monitored before and after the field test and the make-up water pumped from well WW-4. Water quality samples related to process solution included injectate (the mix of groundwater and sulfuric acid injected into the injection wells), pregnant leach solution (PLS) collected from the recovery wells, and water from the impoundment. Process solution samples were taken daily and weekly by field technicians trained in water quality sampling procedures. Water quality analyses were performed by the BHP San Manuel Metallurgical Laboratory, ACTLABS-Skyline of Tucson (now Skyline Assayers & Laboratories), and ACTLABS-Enzyme (now ACTLABS) of Ancaster, Ontario, Canada. Field data (water level, electrical conductance, and pH) were recorded and entered by BHP field technicians on a daily basis.

The groundwater and process solution analyses related to the field test and subsequent rinsing phase are available in a Microsoft Access® database (FlorenceDB.mdb-revised 6/28/2010) for the period from November 1, 1997 through October 1999. Although the number of sampling points decreases after March 1998, sampling data are also available from 2000 through 2007. The database contains records of water quality sampling, well construction and well history details, flow data, the results of mechanical integrity tests, and other information. Data entry forms, queries, and reports that generate graphical views of the concentrations of constituents for various sets of wells are also available in the database. The data were originally entered by BHP employees to record the results of drilling (well construction details, costs, integrity tests) and the results of solution analyses related to the ISCR and rinsing field test.

20.1.5 Groundwater Geochemical Modeling

Curis Arizona engaged Schlumberger Water Services (SWS) to update the geochemical modeling for the FCP. SWS prepared a technical memorandum (SWS, 2012) detailing the geochemical modeling for the FCP. The geochemical model combined the results of laboratory column tests, the BHP field leach test, and mineralogical evaluations to simulate the fluid/rock interactions and fluid/fluid mixing to simulate the planned ISCR process. The model was designed as a predictive tool to determine solution chemistry during operation, during rinsing, and post rinsing of the ISCR area. The model included simulations of rinsing to achieve post-closure water chemistry objectives which are set forth in the APP permit as required by State and Federal regulations. The results of the rinsing simulations indicate that concentrations of sulfate and other constituents may be achieved through rinsing with 8.5 to 9 pore volumes of natural formation water.

20.1.6 Groundwater Hydrologic Modeling

Curis Arizona retained Brown and Caldwell (BC) to review and revise a sub-regional groundwater flow model developed in support of the APP and UIC Permit applications submitted by BHP in 1996. BC found that the substantial quantity of site-specific hydrologic data generated since 1996 warranted a thorough revision of the earlier groundwater flow model. In 2010, BC created new groundwater flow model covering the same sub-regional model domain used in the 1996 model using improved software and model construction techniques.

The groundwater flow model includes a domain covering an area of approximately 125 square miles, with the 212-acre ISCR area located at the center. To provide improved resolution of groundwater flow within and around the ISCR area, the model cells telescope in size from 500 by 500 feet at the edges of the domain, to 12.5 by 12.5 feet at the center of the domain. Updates to the model include the incorporation of 14 years (1996-2010) of on-site groundwater elevation data and updated Arizona Department of Water Resources (ADWR) recharge, pumping, and water level elevation datasets for the broader model domain. The model was calibrated using publicly available groundwater data for the period of 1984 to 2010.

The model drew heavily from datasets developed by ADWR. BC consulted with ADWR regularly during the model development process to ensure that the final model would be compatible with other groundwater models and associated model results generated by ADWR.

Predictive simulations included 22 years of ISCR pumping with concurrent and successive formation rinsing at the proposed commercial development rates, and 30 years of post-closure migration of dissolved minerals resulting from the ISCR process. The 2010 groundwater flow model has demonstrated that sufficient groundwater resources are available to support full commercial development of the FCP copper oxide mineralized material body ISCR methods with minor residual groundwater level impacts.

20.1.7 Hydraulic Control and Rinsing Test

BHP constructed and operated a pre-operational compliance test in 1997/98 to satisfy a specific condition of the APP. The APP required a demonstration of hydraulic control be performed for a period of 90 days prior to commencement of commercial operations. The BHP hydraulic control test was conducted from November 8, 1997 through February 10, 1998. The goal of the test was to demonstrate that four pairs of pumping and observation wells were adequate to demonstrate a continuous inward hydraulic gradient in the aquifer. BHP prepared a report on April 6, 1998 documenting the hydraulic control test. This report was submitted to ADEQ and USEPA as a demonstration of compliance with the permit condition. Following completion of the test, ADEQ amended the permit by removing the 90-day, pre operational test requirement and re-issuing the permit for full commercial operation.

BHP subsequently decided to abandon the project for economic reasons and began rinsing the test well field to meet the closure obligations in the APP. BHP began rinsing in 1998 and Merrill Mining continued the rinsing subsequent to their purchase of the project. The rinsing conducted by BHP and Merrill Mining demonstrated that, through a combination of injection and passive inflow of fresh formation water, that the sulfate and other constituent concentrations can be rinsed to levels established in the APP for closure.

20.2 WASTE DISPOSAL

The ISCR process will preclude the creation of traditional mining wastes such as waste rock and tailings. By comparison to traditional mining methods, the ISCR process will result in a substantially lower volume of process waste. ISCR process wastes are limited to solids derived from treatment of solutions produced from formation restoration and smaller incidental flows.

Curis Arizona retained ARCADIS to perform a Pre-Feasibility assessment of technologies available to treat the formation rinse water extracted after conclusion of ISCR at individual extraction blocks beginning in year 5 of commercial operations.

The flow to the water treatment plant will be comprised of three solution streams including hydraulic control water, raffinate bleed, and extracted rinse water. The hydraulic control stream is the solution that will be pumped from the perimeter of the active leach area and formation restoration area to achieve the permit requirement to remove more solution from the formation than is injected at any given time. The raffinate bleed solution is a small volume removed from the system to maintain the necessary solution balance in the well field circuit. The formation rinse solution is the solution required to be treated and re-injected as a closed loop to maintain the water balance in the water impoundments and accelerate formation rinsing.

Of these three solution streams, the formation rinse solution will represent the greatest volume. The extracted rinse water will contain a high sulfate concentration (greater than 8,000 milligrams per liter [mg/L]) and trace amounts of various other dissolved constituents metals. Treatment objectives include reducing the sulfate concentration to less than 150 mg/L and removal of other constituents of concern to meet water quality standards for reuse of the water by reinjection to accelerate rinsing.

The objective of the formation restoration is to achieve the rinsing criteria established in the APP and close wells within 2 to 6 years after commercial operations cease at each extraction block. The planned copper extraction sequence, and subsequent block closure schedule, was used to predict the timing of rinsing water demand and volumes of rinse water required for any given period. Simulations were prepared by SWS using the Curis geochemical model for the 2, 4, and 6 year scenarios to determine rinse flow rates and predicted sulfate loading in the rinse water. The most conservative case of the 2 year rinse scenario (i.e., the highest volume) was selected for this Pre-Feasibility analysis.

The water treatment process identified by ARCADIS includes high density solids (HDS) treatment with lime neutralization, followed by low pressure microfiltration (MF) and reverse osmosis (RO). Water treatment is implemented in phases, starting with HDS lime neutralization in year one, and MF and RO processes coming on line in year 5 when the first blocks are scheduled for rinsing and closure. In year 11 water treatment capacity is increased by adding another HDS treatment train to accommodate increased rinsing flows. The HDS circuit will ramp up and produce approximately 27,300 gpd of neutralized waste product in years 1 through

5, 94,000 gpd in years 5 through 10, and 132,000 gpd during years 11 through 27. At 20% solids content, these flows will contain approximately 92 tpd and 129 tpd of solids on a dry basis in years 5 through 10 and years 11 through 27 respectively. RO will achieve approximately 50 percent water recovery, generating average brine waste flows of approximately 610 gpm during years 5 through 10, and 1,050 gpm during years 11 through 27. The reverse osmosis flows will include approximately 4% solids and will be directed to the mechanical evaporation system. The settled density of the combined solids from the treatment system will be approximately 70 pounds per cubic foot (lb/ft^3). Figure 20-1 shows the flow of the various material streams through the process.

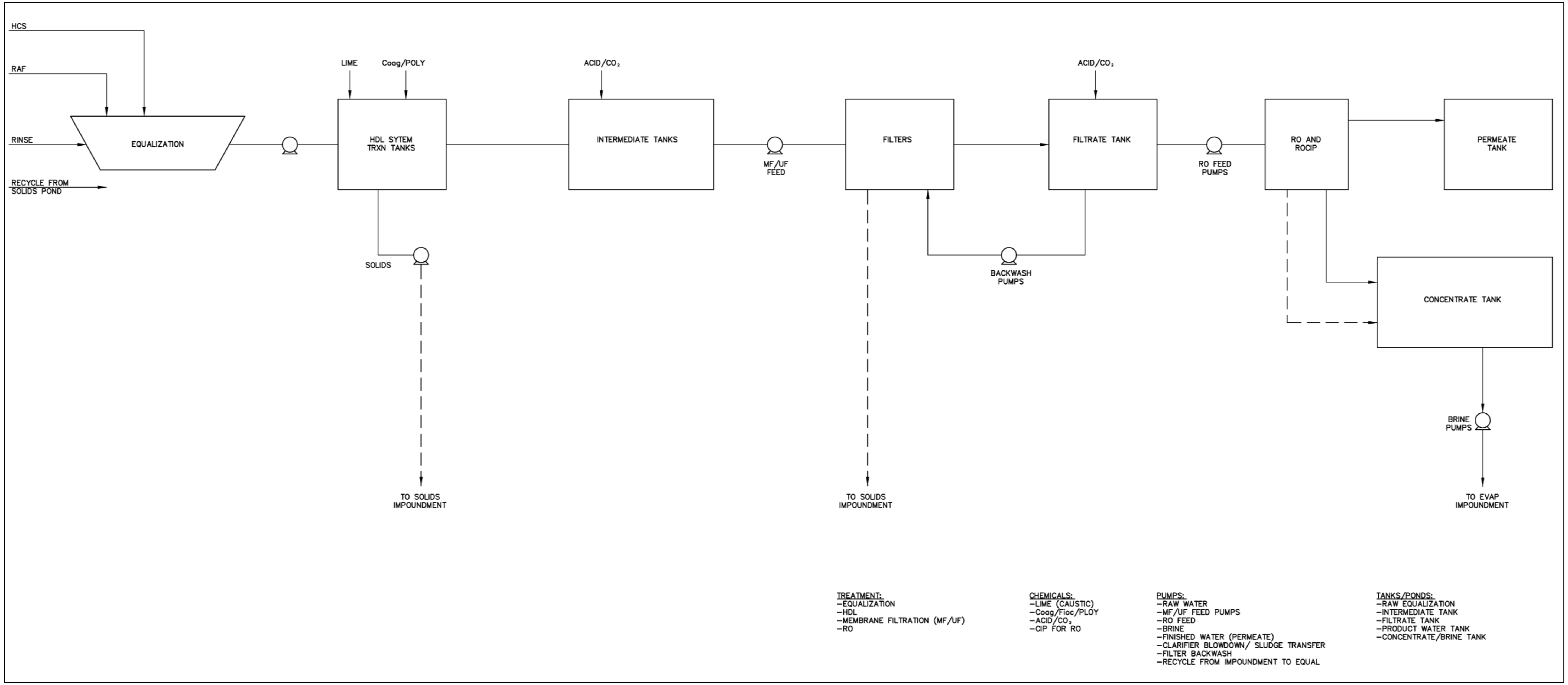


Figure 20-1: Material Stream Flow Diagram

The solids produced by the water treatment system will be deposited in a series of ponds designed to best available demonstrated control technology (BADCT) standards to receive process fluids and solids. Curis Arizona retained Knight Piésold ("KP") to design the ponds that will contain the solids, and will be used for fluids management. Using fluid flow and solids values provided by ARCADIS, KP estimated the volume and corresponding size and number of ponds required to contain the solids. KP estimated that a total of approximately 76 million cubic feet (mcf) of solids would be produced over the life of the ISCR facility and that those solids could be contained within five impoundments, with a capacity of 15.2 mcf per impoundment with appropriate freeboard remaining. The existing water impoundment constructed by BHP and the remaining capacity of the PTF water impoundment will be used to help manage fluid flows and allow optimization of solids storage in the five proposed impoundments (KP, 2012).

20.3 PERMITTING REQUIREMENTS

Several environmental permits are required for operation of the FCP. A comprehensive list of the required permits and a description of the status of those permits is provided in Section 4.7 of this document. Section 4.7 provides details of the authorization, agency involved, purpose, term, history, and status of the various permits. Table 4-1 lists each of the permits required to operate the planned ISCR facility, as well as the jurisdictional authority, issue date, expiration date, and current status of those permits. Curis Arizona has obtained, or is in the process of obtaining, the various permits required to commence operations.

The Curis private property in the Town of Florence has been known to support active mining operations or investigations for some forty years, although in recent years the Town of Florence has zoned it for a mix of residential, commercial and industrial uses. The State Land portion of the project is not subject to the Town's jurisdiction. Curis Arizona plans to initially develop the FCP on the Arizona State Trust land and expand into the remaining portion of the resource following completion of copper extraction on the State Land.

State and Federal permitting authorities are in the process of reviewing all FCP's technical, development and environmental protection measures proposed for the project in both Phase 1 and Phase 2 commercial scale operations. Discussions are ongoing with local stakeholders with regards to addressing any remaining project related concerns.

20.4 SUSTAINABLE COMMUNITY DEVELOPMENT

20.4.1 Approach, Mission and Vision

Florence Copper's Mission Statement is as follows:

> *"To create exceptional economic and societal value by pioneering next-generation copper production practices and technologies that protect the natural environment and foster healthy, engaged communities."*

Florence Copper will follow best practices currently used in the extractive sector to support social, community and sustainable development, including:

- Foster constructive working relationships and alliances among community, companies and government.
- Build capacity within governments, companies and communities to address sustainable development issues at the local level.
- Promote the value-adding potential of mine development and operation in support of local and regional social and economic sustainable development efforts.
- Improve opportunities for the sustainable development of mining communities and regions during all phases of the mining cycle.

These approaches are based on work by the World Bank Group, the International Finance Corporation, the "Breaking New Ground" report of the Mining, Minerals and Sustainable Development (MMSD) project, and the International Council on Mining & Metals (ICMM).

Florence Copper will follow HDI's adopted principles:

Table 20-1: Florence Copper's Principles of Responsible Mineral Development

Health and Safety	"We operate in a responsible manner so that our activities protect the health and safety of our employees and contractors, and of the communities in which we work."
Stakeholder Engagement	"We engage with governments, communities, indigenous peoples, organizations, groups and individuals on the basis of respect, fairness, transparency, and meaningful consultation and participation."
Community Development	"We establish productive local partnerships to contribute to achieving development goals identified by communities in which we work, to address local priorities and concerns, and to have communities derive substantive benefits from our activities."
Environment and Society	"We apply environmental and social best management practices in the planning, design and implementation of our activities, from exploration through to closure of our mining operations. We meet or exceed regulatory requirements in the jurisdictions in which we work."
Resource Use	"We use land, water and energy resources responsibly; strive to maintain the integrity and diversity of ecological systems; and apply integrated approaches to land use."
Human Rights	"We respect human rights principles, as well as local cultures, customs and values, in our dealings with employees, communities and other stakeholders."
Labor Conditions	"We provide fair treatment, non-discrimination and equal opportunity for our employees, and comply with labor and employment laws in the jurisdictions in which we work. We strive for excellence in relations between management and employees."

Florence Copper will integrate these Principles of Responsible Mineral Development within the corporate management and decision-making, and work to continually improve performance and meet international best practices in all operations.

20.4.2 Relationship Between FCP and Sustainable Community Development

Community development is the process of increasing the strength and effectiveness of communities, improving people's quality of life, and enabling people to participate in decision making to achieve greater long-term control over their lives. Sustainable community development programs are those that contribute to the long-term strengthening of community viability.

The long-term benefits of a community development program around a resource operation are the skills and capacities that training, employment, and education programs for local people provide. The essential element of a sustainable community development program is that it can survive without input from a resource company especially after the project is finished. Thus, community sustainability can be supported by resource development practices that help build human and social capital that remain while the project is in progress and after it is complete.

Florence Copper can assist community development by acting as a catalyst for positive change. In order to accomplish this, communication and alignment with community leadership is critical. Florence has existing community plans and organizations. Florence Copper should work with the city and its organizations as the community evolves.

Florence Copper will work with the community to determine how to best leverage the company's areas of expertise to assist with community needs. Skills such as administration, trade, management, finance, operating and maintaining equipment and improving local supplier and contractor capability all will help support Florence in core ways. Partnership programs for local apprentices in these areas of capacity building will lead to local hiring and keeping dollars circulating in the local economy.

Local agriculture development is a key area of community sustainability. There is an opportunity to work together to find more efficient, cost-effective and safer ways to transport common supplies such as fuel and chemicals. Florence Copper will work cooperatively to explore possible synergies.

Community development is a reciprocal process. By helping Florence to develop in a sustainable manner, the project will simultaneously help its own business to succeed.

20.4.3 Principles for Sustainable Community Development

FCP's principles for sustainable community development are:

- Adopt a Strategic Approach – link the long-term company objectives by aligning these with the local, regional and state development plans.
- Ensure Consultation and Participation – Local communities are actively involved in all stages of the project conception, design and implementation including closure and post-closure.
- Work in Partnership – Private, Governmental, NGO and community organizations bring different skills and resources but shared interests and objectives. Together these organizations can achieve more through working together than individually. Formal or informal partnerships can also reduce costs, avoid duplication of existing initiatives and reduce community dependency on the copper operation.

- Strengthen Capacity – programs that emphasize strengthening local community and government capacity are more sustainable in the long-term than cash, materials or infrastructure without a properly designed forward-looking participatory framework.

20.4.4 Community Outreach Program/Activities

Since acquiring the Florence Copper site in late 2009, Curis Arizona has implemented a community outreach program and commensurate activities. Public consultation, education, and ongoing dialogue within various stakeholder communities are in progress.

A central component of the outreach program includes informing communities, organizations and individuals that could be potentially affected by the proposed project; disclosure of relevant project information as required and/or necessary to inform stakeholders; and communication paths for residents to express concerns relating to the proposed project.

In general, the involvement of Florence residents and community stakeholders within the region is considered vital to the social responsibility and long-term success of the FCP. From 2010 to the present, primary, secondary, and peripheral stakeholders have been consulted.

Primary stakeholders of Florence Copper include Florence residents and seasonal residents; and those businesses within communities that are likely to be directly impacted by the project. Secondary stakeholders are those municipalities and their residents in proximity to Florence Copper that are likely to be impacted by Curis Arizona's operations (e.g., Coolidge, Arizona). Peripheral stakeholders include County and State agencies and elected leaders at various levels of government.

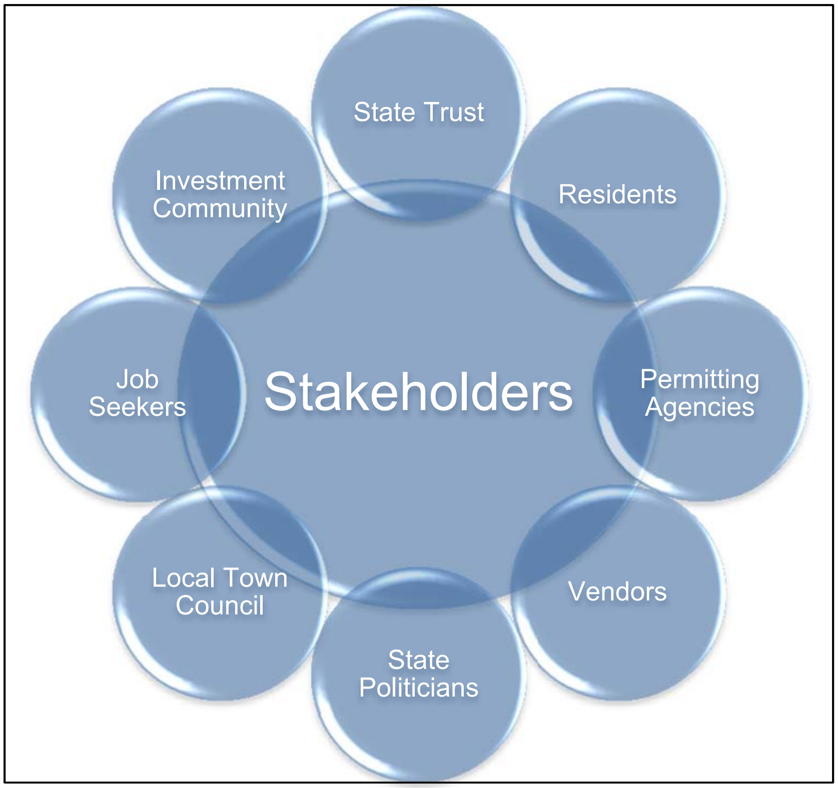


Figure 20-2: Stakeholder Diagram

20.4.4.1 Objectives

General objectives of the FCP community outreach program include the following:

- Disseminate factual information and enhance the community's awareness and understanding about the project.
- Build local, regional, and state-wide understanding and support for Florence Copper.
- Provide ongoing opportunities for two-way dialogue with project stakeholders through a wide range of communication programs and channels.
- Ensure local stakeholders have access to up-to-date and accurate information on Florence Copper.
- Meaningfully engage local residents, landowners, governments, institutions, and special interests in the process by which the FCP is being planned, permitted, built, and operated.
- Better understand local interests, priorities and concerns, and ensure they are adequately addressed through project design and mitigation.

- Optimize local benefits associated with the FCP, including training and employment opportunities, business and contracting opportunities, infrastructure development and partnership opportunities, and community investment.

20.4.4.2 Public Information Program Elements

To achieve the communications objectives, Curis Arizona believes that they must:

- Remain open and transparent and build trust in the community
- Produce focused, consistent, and meaningful communications
- Constantly communicate with the broader public
- Provide education on safety and science of the project

Below is a list of community public information program elements employed and completed since the inception of initial work at the FCP. They are designed to generate community involvement and understanding surrounding the proposed project.

- Site Tours: community relations and other Curis Arizona staff continue to host site tours of the FCP property twice monthly for all stakeholder groups. To date, more than 800 Florence residents, community leaders, and business owners, as well as the Florence Town Council and Staff members, have toured the property and facilities.
- Presentations: community relations staff have given more than 50 community presentations to stakeholder groups interested in the FCP.
- Industry Organizations: at the regional and state levels, participation in industry organizations such as the Society of Metallurgical Engineers, the Arizona Mining Association, and the recently formed Arizona Mining Alliance.
- Local Advertising: Curis Arizona has consistently communicated in the region via traditional advertising channels.
- Communications, Collateral & Media: regular lines of communication to stakeholders and stakeholder organizations are ongoing. Communications via a monthly electronic newsletter, email updates, and the Florence Copper website.
- Open Houses: Curis Arizona sponsored and hosted five events in Florence in 2010 and 2011.

20.4.4.3 Community Investment Foundation

As part of its corporate commitment to positive community and economic development in Florence and Pinal County, on October 6, 2011 Curis Arizona announced the establishment of a multi-year, Economic Development, Community Development and Revitalization Fund – Copper Recovery Enhances Economic Development. Benefitting economic development, downtown revitalization, community service projects, and charitable organizations within the Town of Florence and Pinal County, the fund was established to support local businesses and business groups achieve success.

In 2012, the fund was upgraded to a Foundation called the Florence Copper Community Foundation. The Foundation will be governed by 5 Board members with two being from the community. Key decision makers in town will advise the Board. The funding will be established in two phases based on the development stages of the FCP. Phase I of this program will correspond to the first operational phase of the project, known as the Production Test Facility ("PTF"), currently scheduled to begin once permits have been received. Phase II will occur during full commercial operations.

In the PTF phase, Florence Copper will establish the Foundation with a budget of $100,000. Curis Arizona's initial seed contribution during this phase is intended to support the creation of the fund and its governance model, explore and establish partnership agreements with local and/or newly created organizations, and provide some funding for community based projects.

Projected funding for Phase II of the Foundation has yet to be determined and will be done during Phase 1 based on the outcome of the test facility.

Establishment of this fund is not required by law and would be in addition to normal tax benefits that would flow to Florence, Pinal County, and Arizona as a result of commercial operations. They are intended to represent a significant contribution to the overall economic picture for the Town.

20.4.5 Community Surveys

Florence Copper enjoys a majority of support from residents within the Town as evidenced by internal polling and Florence's own 2011 Citizen Survey. Issues of highest concern for Florence residents are a lack of jobs and the depressed economy; education; ground water protection and public safety.

The Company commissioned internal polling research in September 2010, May 2011, and again in September 2011. New polls will be conducted in the second quarter of 2013. The basic goals of polling were to:

- identify stakeholders;
- confirm results from community outreach program activities;
- identify the positive and negative opinion related to operations of the proposed project;
- identify key concerns and how best to address;
- identify communication gaps

All survey results consistently show a clear majority of support for Florence Copper among registered voters in the community by a nearly 2-1 margin among respondents with an opinion.

20.4.6 Socioeconomic Analysis[2]

Florence Copper commissioned the L. William Seidman Research Institute at Arizona State University (ASU) to conduct an Economic Impact Study for the Project. It is anticipated that the Town of Florence, Pinal County, and the State of Arizona stand to benefit greatly in terms of high-wage employment and millions in total revenues as a result of Florence Copper operations.

The ASU Economic Impact Study concludes the following impacts to the socioeconomic environment in the region as a result of Florence Copper:

- Gross State Product (GSP) is the most comprehensive indicator of economic performance for a state or region And represents new production, sometimes called "value added." GSP for Arizona and Pinal County contribute to the tally of Gross Domestic Product (GDP) for the nation, our measure of the country's annual output of goods and services.
    - Gross State Product Impact: it is estimated that the FCP will add $2,245.1 million to Arizona Gross State Product (see Table 20-2) over the life of the project.
    - Gross State Product (GSP) produced in Pinal County will increase by $1,078.2 million over this period.
    - The annual average addition to Arizona GSP over the entire project life is estimated at $80.2 million (in constant 2011 dollars). The annual average addition to GSP produced within Pinal County is estimated at $38.5 million.
- Employment Impact:
    - The FCP will create and support an estimated annual average of 681 Arizona jobs (see Table 20-3) over the duration of the mine.
    - The annual average employment within Pinal County from the FCP will be 406 jobs.
    - Approximately 170 jobs will be required at the FCP site for mineral recovery during the operations phase.
    - 18.7% of workers on site are in scientific, technical, or engineering occupations (see Table 20-4).
    - Over all of the project phases, more than 500 additional Arizona jobs supported each year will be in other industries in the overall general economy.

The job count includes the direct employment on site, jobs supported indirectly in firms or government agencies that supply goods and services to the FCP, as well as induced employment that stems from the expenditures of all these workers as consumers.

[2] Source: L. William Seidman Research Institute at Arizona State University, Florence Copper Project – Economic Impact Study, 2011.

- Personal Income:
  - FCP will increase Personal Income in Arizona by an estimated $1,464 million over the life of the project.
  - Personal Income to residents of Pinal County will rise by an estimated $709 million over this period.
- State Revenue:
  - Economic activity related to the FCP will generate an estimated $204 million in revenue for Arizona public agencies through taxes and fees over the duration of the three phases of the project.
  - It is estimated that more than 90% of new Arizona revenues ($190 million) will be created within Pinal County.

Table 20-2: Economic Impact Summary

Impact Locus	Total Impact	Annual Average Impact
Gross State Product		
Arizona	$2,245,000,000	$80,000,000
Pinal County	$1,078,000,000	$39,000,000
Employment (Jobs)		
Arizona	-	681
Pinal County	-	406
Personal Income		
Arizona	$1,464,000,000	$52,000,000
Pinal County	$709,000,000	$25,000,000
State Revenues		
Arizona	$204,000,000	$7,000,000
Pinal County	$190,000,000	$7,000,000
Note: dollar values are constant 2011 dollars *Source: REMI model of Arizona and Pinal County economies*		

Table 20-3: Economic Impact of Florence Copper Project By Phase

Impact Category	Construction Phase	Production Phase	Reclamation/ Closure Phase	Total Impact
	2012 – 2014	2015 - 2032	2033 - 2038	2012 - 2038
Gross State Product*	**Gross State Product by Phase**			**GSP**
Arizona	146,000,000	1,772,000,000	326,000,000	2,245,000,000
Pinal County	56,000,000	834,000,000	189,000,000	1,078,000,000
Total Employment	**Annual Average Employment by Phase (Jobs)**			**Employment**
Arizona	585	787	392	681
Pinal County	285	453	316	406
Personal Income*	**Personal Income by Phase**			**Personal Income**
Arizona	88,000,000	1,129,000,000	247,000,000	1,464,000,000
Pinal County	34,000,000	532,000,000	143,000,000	709,000,000
State Revenue*	**Annual State Revenue by Phase**			**State Revenue**
From Activity in Arizona	14,000,000	154,000,000	36,000,000	204,000,000
From Activity in Pinal Co.	13,000,000	143,000,000	33,000,000	190,000,000

** Values in Millions of 2011 Dollars*
Source: REMI Model of Arizona and Pinal Co. economies

Table 20-4: Occupations in U.S. Mineral Mining Compared to Florence Copper Project Workforce

Category	U.S. Workforce Distribution	Florence Copper Workforce
All Occupations	100.0%	100.0%
Administration, Business, Financial, Office	17.3%	16.1%
Scientific, Technical, Engineering	9.1%	18.7%
Operations, Extraction	51.3%	26.7%
Maintenance, Materials, Equipment, Storage	22.3%	38.5%

Source: U. S. Bureau of Labor Statistics, National Employment Matrix, 2008 and Florence Copper

20.4.7 Local Hire & Procurement Policy

Curis Arizona, the company that owns Florence Copper, mandates a hiring and procurement policy for the company, contractors, and consultants. Details of the policy are as follows. Curis Arizona will:

- Ensure that local people receive priority consideration for employment, based on qualifications and merit;
- Ensure that local companies (contractors, suppliers and consultants) receive priority consideration for contract opportunities, based on qualifications and merit;
- Facilitate access to training to ensure that local residents gain the skills and qualifications necessary for employment; and
- Assist local companies to identify future contract opportunities and to build the capacity necessary to benefit from these opportunities.

Consideration for awarding new employment and contract opportunities will always be qualifications and merit. Among qualified candidates and companies, preference will be given to those in closest proximity to Curis Arizona's operations.

20.4.8 Economic Summary

The establishment of Florence Copper is expected to result in a number of economic benefits for Florence, Pinal County, and Arizona. In addition to the aforementioned merits, the project will:

- Significantly increase the percentage of private sector employment in Florence.
- Increase employment opportunities for skilled workers in Florence and Pinal County.
- Add economic diversity to the region and complete the "Copper Corridor" in Arizona.
- Increase the number of high wage jobs in Florence and the region.
- Offer an incentive for younger workers to live in Florence and Pinal County.
- Demonstrate good environmental operating practices, social responsibility and economic viability.

20.5 MINE CLOSURE REQUIREMENTS AND COSTS

Mine closure requirements for the FCP will consist of remediation (closure) and reclamation activities. The mine closure requirements require restoring the affected property and aquifer to pre-mining conditions unless certain facilities are shown to remain to support the post mining land use. Remediation requirements generally refer to the closure of the facilities that are related to the APP and the UIC Permit. The reclamation activities generally relate to reclaiming of surface disturbances and structure removal and are covered in the Mined Land Reclamation Plan (pending).

Curis Arizona prepared and submitted a significant amendment application to the ADEQ which included cost estimates for the closure and post-closure care of facilities that are subject to individual permit requirements pursuant to Arizona Revised Statutes (A.R.S.) § 49-241.B and Arizona Administrative Code (A.A.C.) R18-9-A201(B)(5). Components of the FCP that are subject to individual permit requirements include: an ISCR area, including injection and recovery wells; a raffinate pond; a PLS pond; a plant runoff pond; and multiple water impoundments. The components are similar in design and serve the same purpose as the facilities for which construction and operation were authorized in the APP issued by ADEQ to BHP on June 9, 1997.

Curis Arizona is intending to provide post closure financial assurance in increments taking into account the amount of the ISCR area in which operations will occur. The closure and post closure costs prepared for the APP significant amendment application include closure and post-closure costs required by the UIC Permit.

Curis Arizona will submit a Reclamation Plan to the Arizona State Mine Inspector (ASMI) in accordance with A.A.C. R11-2-101 *et seq*. The Reclamation Plan will describe an approach for reclaiming disturbances subject to the cited regulations. The purpose of the ASMI reclamation regulation is different than the purpose of closure as described in the APP and the UIC Permit. Therefore, reclamation as per ASMI regulations may be required in areas of the FCP beyond those covered by the APP and the UIC Permit closure plans, or for infrastructure (e.g., roads) that service or support facilities that are closed in accordance with APP and UIC Permit requirements.

20.5.1 APP and UIC Closure and Post-closure Costs

The closure and post-closure costs were originally developed by BC to support the APP Significant Amendment Application. It is assumed that closure will begin when copper concentrations in the PLS pumped from the last remaining resource blocks in the ISCR area decline to levels that can no longer be economically recovered. The closure activities are briefly described below. The closure plan assumes that concurrent reclamation of previous operational units has been completed during operations. Table 20-5 provides the detail cost estimate included with the significant amendment application. Additional information is presented in the footnotes to the table in Appendix B.

Note that this is historical information and not included in the financial model.

Table 20-5: Curis Resources (Arizona) Inc. 2010 Closure and Post-Closure Cost Estimates

OBJECTIVES	DESCRIPTION OF TASKS	UNIT COST	PER UNIT	NO. OF UNITS	ESTIMATED COST
	SECTION 1. ISCR WELLS				
1. Groundwater Restoration					
Restore groundwater to meet AWQS/AQL standards, and neutralize/evaporate rinse solution. (Assumed 3 pore volumes for well rinsing, 24 month period) ISCR wells include 290 injection wells and 307 recovery wells.	1.Rinse wells. [10]	$6,275,664	Lump Sum	1	$6,275,664
	2. Operation and maintenance labor (includes rinsing, neutralizing and evaporation for 24 month period)[19]	$1,460,000	Lump Sum	1	$1,460,000
	3. Quicklime Neutralization[16]	$0.06	lb	255,076,126	$15,304,568
	4. Evaporate impoundment contents using facility evaporators.[11]	$1.06	1,000 Gallons	2,550,761	$2,703,807
	5. Sampling and monitoring during rinsing. Level 1 analysis performed quarterly during 24 month rinsing period. (Assumed system is equipped with a manifold and will require 1 sampling location per event)[12]	$650	Sampling Event	8	$5,200
	6. Analysis to confirm AWQS/AQLs, Level 2 analysis. (Assumed system is equipped with a manifold and will require 1 sampling location per event)[13]	$1,580	Sampling Event	1	$1,580
	7. Final sampling. Level 1 analysis performed on each well after AWQS/AQL is confirmed.[12]	$650	Well	597	$388,050
	Subtotal				**$26,138,868**
2. Abandon ISCR Wells					
Abandon 597 ISCR wells plus 5 observation wells in accordance with ADWR regulations and in accordance with Part II.H.2 of APP and August 27,1996 Well Abandonment Plan (Appendix C of UIC Permit).[6]	1. File NOIs with ADWR.	$50	Well	602	$30,100
	2. Remove electrical conduit, wellhead assemblies and control boxes.	$350	Well	597	$208,950
	3. Remove pumps.	$350	Well	597	$208,950
	4. Remove monuments and cement pads. Cut off casing 5 feet below land surface and backfill hole. (2 crew hours per well)	$140	Crew Hours	1,204	$168,560
	5. Dispose of liners, wood, and misc. pipe in off-site landfill (5 cy/well).	$50	CY	3,010	$150,500
	6. Type V Cement ($240/CY, 0.017 cy/ft)	$4.20	LF	562,609	$2,362,958
	7. Tremie Type V cement from TD to 5 feet below land surface.	$1.00	LF	562,609	$562,609
	8. Crew and equipment (per diem, backhoe, 10T smeal rig)	$4,000	Well	602	$2,408,000
	9. Mobilization/Demobilization	$1,500	Lump Sum	1	$1,500
	10. File Abandonment Completion Reports with ADWR.	$30	Well	602	$18,060
	11. Allowance for unexpected conditions.	$200	Well	602	$120,400
	Subtotal				**$6,240,587**

OBJECTIVES	DESCRIPTION OF TASKS	UNIT COST	PER UNIT	NO. OF UNITS	ESTIMATED COST
3. Piping					
Clean and disposal of pipe. (20,700 LF, 24" diam.)	1.Clean and remove pipes. [1]	$122	Crew Hour	207	$25,254
	2. Dispose of pipe in off-site landfill.[2]	$60	Ton	675	$40,500
	Subtotal				**$65,754**
4. Soil and Liner Beneath Piping					
Perform analysis to verify no impacts to soil beneath liner. (Assumed to be non-hazardous)	1. Perform initial sampling and analysis (S&A)to verify non-hazardous.(1 sample per 50 feet of trench)[3]	$300	Sample	138	$41,400
	2. Remove liner.[4]	$0.05	SF	414,000	$20,700
	3. Dispose of liner in off-site landfill.[2]	$60	Ton	62	$3,720
	4. Backfill ditch using on-site soil.[5]	$3	CY	30,667	$92,001
	Subtotal				**$157,821**
ISCR Wells Total					**$32,603,030**
	SECTION 2. PLS POND				
1. Water Evaporation					
Evaporate maximum allowable water volume in impoundment (5,236,000 gallons) .	1. Evaporate impoundment contents using facility evaporators.[11]	$1.06	1,000 Gallons	5,236	$5,550
	Subtotal				**$5,550**
2. Sediment					
Sample and properly manage sediments. (Assumed to be non-hazardous)	1. Perform initial sampling and analysis (S&A) to verify non-hazardous.[3]	$300	Sample	30	$9,000
	2. TCLP analysis required for soil or sediment that is sent off site for disposal.[7]	$210	Sample	30	$6,300
	3. Remove sediment and transport off site for disposal. Assume non-hazardous classification.[2]	$60	Ton	1,000	$60,000
	Subtotal				**$75,300**
3. Liner and Earthwork					
Remove and dispose of liner in off-site solid waste landfill. Test and properly manage soil below liner. (Assumed to be non-hazardous)	1. Remove liner.[4]	$0.05	SF	200,000	$10,000
	2. Dispose of liner in off-site landfill.[2]	$60	Ton	30	$1,800
	3. Dispose of miscellaneous pipeline/equipment in off-site landfill.[2]	$60	Ton	5	$300
	4. Fill, compact, and recontour to near original contours (assumes berm material to be used as fill).[5]	$3	Cubic yard	30,000	$90,000
	5. Contingency S&A if soil shows evidence of liner leak.	$300	Sample	5	$1,500
	6. Contingency TCLP analysis if required for soil or sediment that is sent off site for disposal. [7]	$210	Sample	5	$1,050
	Subtotal				**$104,650**
PLS Pond Total					**$185,500**
	SECTION 3. RAFFINATE POND				
1. Water Evaporation					

OBJECTIVES	DESCRIPTION OF TASKS	UNIT COST	PER UNIT	NO. OF UNITS	ESTIMATED COST
Evaporate maximum allowable water volume in impoundment (5,236,000 gallons) .	1. Evaporate pond contents using facility evaporators.[11]	$1.06	1,000 Gallons	5,236	$5,550
	Subtotal				**$5,550**
2. Sediment					
Sample and properly manage sediments. (Assumed to be non-hazardous)	1. Perform initial sampling and analysis (S&A)to verify non-hazardous.[3]	$300	Sample	30	$9,000
	2. TCLP analysis required for soil or sediment that is sent off site for disposal.[7]	$210	Sample	30	$6,300
	3. Remove sediment and transport off site for disposal. Assume non-hazardous classification.[2]	$60	Ton	1,000	$60,000
	Subtotal				**$75,300**
3. Liner and Earthwork					
Remove and dispose of liner in off-site solid waste landfill. Test and properly manage soil below liner. (Assumed to be non-hazardous)	1. Remove liner.[4]	$0.05	SF	200,000	$10,000
	2. Dispose of liner in off-site landfill.[2]	$60	Ton	30	$1,800
	3. Dispose of miscellaneous pipeline/equipment in off-site landfill.[2]	$60	Ton	5	$300
	4. Fill, compact, and recontour to near original contours (assumes berm material to be used as fill).[5]	$3	Cubic yard	30,000	$90,000
	5. Contingency S&A if soil shows evidence of liner leak.	$300	Sample	5	$1,500
	6. Contingency TCLP analysis if required for soil or sediment that is sent off site for disposal. [7]	$210	Sample	5	$1,050
	Subtotal				**$104,650**
Raffinate Pond Total					**$185,500**
SECTION 4. RUN-OFF POND					
1. Water Evaporation					
Evaporate maximum allowable water volume in impoundment (5,236,000 gallons) .	1. Evaporate impoundment contents using facility evaporators.[11]	$1.06	1,000 Gallons	5,236	$5,550
	Subtotal				**$5,550**
2. Sediment					
Sample and properly manage sediments.	1. Perform initial sampling and analysis (S&A)to verify non-hazardous.[3]	$300	Sample	30	$9,000
	2. TCLP analysis required for soil or sediment that is sent off site for disposal.[7]	$210	Sample	30	$6,300
	3. Remove sediment and transport off site for disposal. Assume non-hazardous classification.[2]	$60	Ton	1,000	$60,000
	Subtotal				**$75,300**
3. Liner and Earthwork					
Remove and dispose of liner in off-site solid waste landfill. Test and properly manage soil below liner.	1. Remove liner.[4]	$0.05	SF	88,000	$4,400
	2. Dispose of liner in off-site landfill.[2]	$60	Ton	14	$840
	3. Dispose of miscellaneous pipeline in off-site landfill.[2]	$60	Ton	2	$120

OBJECTIVES	DESCRIPTION OF TASKS	UNIT COST	PER UNIT	NO. OF UNITS	ESTIMATED COST
(Assumed to be non-hazardous)	4. Fill, compact, and recontour to near original contours (assumes berm material to be used as fill).[5]	$3	Cubic yard	9,300	$27,900
	5. Contingency S&A if soil shows evidence of liner leak.	$300	Sample	5	$1,500
	6. Contingency TCLP analysis if required for soil or sediment that is sent off site for disposal.[7]	$210	Sample	5	$1,050
	Subtotal				**$35,810**
Run-off Pond Total					**$116,660**
	SECTION 5. WATER IMPOUNDMENTS				
1. Water Evaporation					
Pond assumed dry after well rinsing/neutralizing/evaporation.	1. Evaporate impoundment contents using facility evaporators.[11]	$1.06	1,000 Gallons	0	$0
	Subtotal				**$0**
2. Liner and Earthwork					
Sediments assumed non-hazardous. (Assumes 4 ponds exist at time of closure, 4.0 MCF each per Knight Piésold draft design plans 12/13/10)	1. Fold liners inward over outer edge of sediments.[14]	$62,710	Lump sum	1	$62,710
	2. Cover impoundment and recontour to provide surface drainage away from the impoundments, minimum 3 feet cover.[5]	$3	Cubic yard	592,592	$1,777,776
	3. Remove chain link fence.[18]	$3.47	LF	13,600	$47,192
	4. Contingency S&A if soil shows evidence of liner leak.	$300	Sample	20	$6,000
	5. Contingency TCLP analysis if required for soil or sediment that is sent off site for disposal.[7]	$210	Sample	20	$4,200
	Subtotal				**$1,897,878**
Water Impoundment Total					**$1,897,878**
	SECTION 6. TANK FARM				
1. Tank Farm					
Empty tanks of contents, rinse and decommission for re-use. Remove concrete and liner.	1. Neutralize contents of acid and sodium hydroxide tanks and place in impoundment for evaporation.	$1,400	Lump sum	1	$1,400
	2. Triple rinse tanks and dispose of rinsate in water impoundment.[15]	$122	Crew Hour	48	$5,856
	3. Relocate tanks.	$125	Crew hour	32	$4,000
	4. Sample concrete.[9]	$200	Sample	20	$4,000
	5. Analyze concrete.[9]	$400	Sample	20	$8,000
	6. Demo and remove concrete liner.	$6.78	Square foot	7,200	$48,816
	7. Transport and disposal concrete at off-site landfill.[2]	$60	Ton	1,000	$60,000
	8. Remove pipe and dispose in off-site landfill.[2]	$60	Ton	8	$480
	Subtotal				**$132,552**
2. Soil Beneath Aboveground Storage Tanks and Piping					

OBJECTIVES	DESCRIPTION OF TASKS	UNIT COST	PER UNIT	NO. OF UNITS	ESTIMATED COST
Characterize and appropriately dispose, as necessary.	1. Collect and analyze soil samples for characterization.[3]	$300	Sample	14	$4,200
	Subtotal				**$4,200**
Tank Farm Total					**$136,752**
SECTION 7. SEPTIC TANK CLOSURE					
1. Close septic tanks that serve the administration building and SX/EW.	Pump out (2) 1,000-gallon septic tank and close in place.	$10,000	Lump sum	1	**$10,000**
SECTION 8. MISCELLANEOUS COSTS					
1. Daily Monitoring and Observations					
Perform facility inspections and monitoring required by permit.	Included in Operation and maintenance Labor item in Section 1.				$0
2. Quarterly Well Monitoring					
Perform quarterly monitoring of 31 POC wells. (during closure)	Monitoring, $19,500 per Level 1 Event.	$19,500	Lump sum	8	$156,000
Total Miscellaneous Costs					**$156,000**
Closure Cost Subtotal					**$35,291,321**
Contingency (15%)					**$5,293,698**
Administrative and Miscellaneous Expenses (10%)[17]					**$3,529,132**
Closure Cost Total					**$44,114,151**
SECTION 9. POST-CLOSURE MONITORING					
1. Initial monitoring					
	1. One biennial Level 2 event.	$47,500	Event	1	$47,500
	2. Seven quarterly Level 1 events.	$19,500	Event	7	$136,500
	Subtotal				**$184,000**
2. Biennial monitoring					
	Fourteen biennial Level 2 events.	$47,500	Event	14	**$665,000**
3. Maintenance					
	Maintenance of pumps and wells. Perform visual inspection of surface facilities.	$25,000	Event	15	**$375,000**
4. AQL Exceedance Contingency Per UIC Permit (Part II.H.2.b)					
	1. Notify director and collect verification sample.	$6,000	Event	1	$6,000
	2. Notify director of verification results.	$500	Event	1	$500
	3. If verification sample indicates exceedance, submit report to ADEQ and USEPA.	$10,000	Event	1	$10,000
	Subtotal				**$16,500**
Post-Closure Monitoring Total					**$1,240,500**
SECTION 10. POC WELLS					
Abandon 31 POC wells in accordance with ADWR	1. File NOIs with ADWR.	$50	Well	31	$1,550
	2. Remove electrical conduit, wellhead assemblies and	$350	Well	31	$10,850

OBJECTIVES	DESCRIPTION OF TASKS	UNIT COST	PER UNIT	NO. OF UNITS	ESTIMATED COST
regulations and in accordance with Part II.H.2 of APP and August 27,1996 Well Abandonment Plan (Appendix C of UIC Permit).[6]	control boxes.				
	3. Remove pumps.	$350	Well	31	$10,850
	4. Remove monuments and cement pads. Cut off casing 5 feet below land surface and backfill hole. (2 crew hours per well)	$140	Crew Hours	62	$8,680
	5. Dispose of liners, wood, and misc. pipe in off-site landfill (5 cy/well).	$50	CY	155	$7,750
	6. Type V Cement ($240/CY, 0.017 cy/ft)	$4.20	LF	19,000	$79,800
	7. Tremie Type V cement from TD to 5 feet below land surface.	$1.00	LF	19,000	$19,000
	8. Crew and equipment (per diem, backhoe, 10T smeal rig)	$4,000	Well	31	$124,000
	9. Mobilization/Demobilization	$1,500	Lump Sum	1	$1,500
	10. File Abandonment Completion Reports with ADWR.	$30	Well	31	$930
	11. Allowance for unexpected conditions.	$200	Well	31	$6,200
	12. Hydro-seed areas around the wells located in the State Mineral Lease Area	$2,200	Acre	1	$2,200
POC Wells Total					**$273,310**
POST-CLOSURE TOTAL					**$1,513,810**
TOTAL CLOSURE AND POST-CLOSURE COST					**$45,627,961**

20.5.1.1 ISCR Wells

Groundwater Restoration

The APP requires restoration of groundwater in the ISCR area to Aquifer Water Quality Standards ("AWQS") or pre-operational concentrations if those concentrations exceed AWQS. The restoration process involves rinsing the portion of the oxide zone in which injection and recovery has occurred, injecting sodium bicarbonate or other agents as needed to neutralize the groundwater, neutralizing the rinse solution with quicklime or other agents, and evaporating excess water not used for other purposes. The volume of rinse water required to adequately restore the groundwater assumes 6% porosity and 8.5 pore volumes. Groundwater restoration is assumed to take approximately 24 months to complete.

Curis Arizona is conducting ongoing research to optimize both water conservation opportunities and the rapid recovery of the site to pre-development conditions. Rinsing occurs concurrently with production and continues after production for the last of the resource blocks.

Abandon ISCR Wells

Abandon the approximately 259 remaining ISCR wells in accordance with the provisions of the APP and the Well Abandonment Plan referenced in the APP. The Well Abandonment Plan is designed to meet ADWR and USEPA requirements. The following provides a general description of the well abandonment procedures:

- The wells will be closed by removing the downhole pumps and electrical equipment. The well will be filled from the bottom to the top of the hole with Type V Portland cement and the collar pipe will be removed to 5 feet below ground surface ("bgs"). The surface hole will then be backfilled and leveled out.
- All pipelines, electronics, pumps, and other material will be removed off site for reuse, recycling, or landfill disposal.
- A report will be submitted to the ADEQ and USEPA demonstrating that closure conditions required by the APP and UIC Permit have been met.

Piping

Remove the pipelines that were placed in the lined containment channels connecting the ISCR well area to the processing and water impoundment areas. The pipelines will be flushed with groundwater and removed for off-site recycling or landfill disposal. The flushed water will be placed in the water impoundment.

Soil and Linear Beneath Piping

Perform adequate sampling and analysis to verify that soil beneath the pipeline containment channel liner has not been impacted by leaks or spills. Remove liner for off-site landfill disposal. Backfill and level out pipeline containment channel using on-site soil. The closure cost estimate assumes no impacts to soil beneath the liner.

20.5.1.2 PLS Pond

PLS Removal

Dilute PLS and rinse water will be removed from PLS pond and will be conveyed to the water impoundment for neutralization and evaporation.

Sediment

Perform adequate sampling and analysis to verify that pond sediments are non-hazardous. Dispose of sediments in off-site landfill or water impoundment(s). The closure cost estimate assumes sediments are non-hazardous.

Liner and Earthwork

Remove and dispose of high-density polyethylene (HDPE) liner in an off-site landfill. Sample and analyze soil beneath liner for evidence of liner leakage. Backfill and level the pond with on-site berm materials and soils to match surrounding grade. The closure cost estimate assumes soil quality under the bed grade meets compliance criteria.

20.5.1.3 Raffinate Pond

Raffinate Removal

Dilute raffinate and rinse water will be removed from the raffinate pond and will be conveyed to the water impoundment for neutralization and evaporation.

Sediment

Perform analysis to verify that pond sediments are non-hazardous. Dispose of sediments in off-site landfill or water impoundment(s). The closure cost estimate assumes raffinate sediments are non-hazardous.

Liner and Earthwork

Remove and dispose of HDPE liner in an off-site landfill. Sample and analyze soil beneath liner for evidence of liner leakage. Backfill and level the pond with on-site berm materials and soils to match surrounding grade. Closure cost estimate assumes soil quality under bed grade meets compliance criteria.

20.5.1.4 Plant Runoff Pond

Liquid Removal

Any remaining liquid and rinse water will be removed from the plant runoff pond and will be conveyed to the water impoundment for evaporation.

Sediment

Perform adequate sampling and analysis to verify that pond sediments are non-hazardous. Dispose of sediments to off-site landfill or to the water impoundment(s). The closure cost estimate assumes plant runoff pond sediments are non-hazardous.

Liner and Earthwork

Remove and dispose of HDPE liner in an off-site landfill. Backfill and level the pond with on-site berm materials and soil to match surrounding grade. The closure cost estimate assumes no impacts to soil beneath the liner.

20.5.1.5 Water Impoundments

It is assumed that some water impoundment reclamation will occur during commercial operations. Some impoundments will have been closed over the course of the project.

PTF Impoundment Removal

The PTF impoundment is located on State Land and so must be completely removed at closure. Any remaining liquid will be removed from the PTF impoundment and will be conveyed to the water impoundment for evaporation. Sediment will be conveyed to the water impoundment. Remove and dispose of HDPE liner in an off-site landfill. Pond will be backfilled and leveled with on-site berm materials and soil to match surrounding grade. The closure cost estimate assumes no impacts to soil beneath the liner.

Water Evaporation

Use on-site evaporator units or other techniques to expedite the evaporation of the liquid contents in the water impoundments.

Liner and Earthwork

Impoundments constructed on private land may be closed in place. Remove and dispose of chain link fence. Perform sampling and analysis to verify that pond sediments are non-hazardous. Fold liner edges inward over outer edge of sediments. Re-contour berm material over pond to match surrounding grade. Each pond will require 2.0 million cubic feet of backfill to close per KP design plans (KP, 2011). The closure cost estimate assumes that the water impoundment sediments are non-hazardous.

20.5.1.6 Processing Facilities

Tank Farms

The Tank Farms consist of several aboveground storage tanks (ASTs) located adjacent to the water impoundment and within the ISCR area. The tanks will be rinsed clean and moved to a storage area for future use or sold as surplus equipment. Rinse water will flow to the water impoundment. The support materials of the tanks will be checked and disposed of in accordance with applicable state and federal regulations. The liner under the tanks will be removed to an approved off-site disposal facility.

Buildings

Demolish and remove administrative building and SX/EW plant. Remove concrete pads and foundations.

Soil Beneath Aboveground Storage Tanks and Piping

Characterize and, if necessary, dispose of soil beneath aboveground storage tanks and piping.

20.5.1.7 Septic Tanks

Pump out two septic tanks and bury in place. The two septic tanks serve the administration building and the SX/EW plant. A third, portable septic tank will be used for the PTF.

20.5.1.8 Miscellaneous Costs

Daily Monitoring and Observations

Permit conditions require that monitoring wells, the pond, Tank Farm, and related facilities be monitored and inspected on a daily basis. The cost for this item is included in the operation and maintenance labor costs listed in Section 1 of Table 20-5.

Quarterly Well Monitoring

The 31 POC wells are required to be sampled on a quarterly basis and the results of the sample analyses reported. A contractor currently performs this work. The closure cost estimate assumes that this work will continue during the entire 24 months of scheduled closure activities.

Administrative and Miscellaneous Costs, General Project Support Costs

A general cost allowance is included for 24 months of contractor technical support and miscellaneous facility maintenance activities during the closure period. This cost is an allowance for a third party to manage the closure activities on behalf of the permittee. Maintenance activities may include minor facility maintenance such as road grading or minor repairs. Also included in this category are telephone and electrical utility charges (for office facilities), and miscellaneous office and site expenses (postage, office supplies, chemicals, etc.).

20.5.1.9 Post-Closure Monitoring

A groundwater monitoring program will be conducted at all POC wells in accordance with the APP. This monitoring will continue for 30 years during the post -closure period, as required by the UIC Permit. In accordance with the UIC Permit, data generated from each monitoring event will be promptly reviewed and the contingency plans presented in the UIC permit will be followed in the event of an exceedance of an AQL. Monitoring for Level 1 and Level 2 parameters are scheduled to occur with the scope and frequencies specified in the UIC Permit.

During POC monitoring events, perform visual inspection of surface facilities. Areas to be monitored include signage, fences, locked gates, embankments, capped areas, and storm water control measures. Conditions noted during inspections will be documented using inspection forms. Photographs and written reports will be used to document completion of indicated repairs. Monitoring of leak collection and removal systems (LCRSs) will be conducted weekly during the first six months following closure and monthly thereafter. Repairs will be performed as indicated by the inspection monitoring program and will be documented in quarterly reports submitted to ADEQ.

20.5.1.10 POC Wells

At the end of the 30-year post-closure monitoring period, abandon the 34 POC wells in accordance with the provisions of the APP and the well abandonment plan referenced in the APP. The well abandonment plan is designed to meet ADWR and USEPA requirements. The following provides a general description of the well abandonment procedures:

- The wells will be closed by removing the downhole pumps and electrical equipment. The collar pipe will be removed to 5 feet bgs and the well filled from the bottom to the top with Type V Portland cement. The surface will then be backfilled and leveled out.

- All pipelines, electronics, pumps, and other material will be removed for reuse, recycling or off-site landfill disposal.

- A report will be submitted to ADEQ and USEPA demonstrating that conditions established by the APP and UIC Permit have been met.

21 CAPITAL AND OPERATING COSTS

Capital and operating costs for the FCP were estimated on the basis of the Pre-Feasibility design, estimates of materials and labor based on that design, analysis of the process flowsheet and predicted consumption of power and supplies, budgetary quotes for major equipment, and estimates from consultants and potential suppliers to the project.

21.1 OPERATING AND MAINTENANCE COSTS

Operating and maintenance costs for FCP operations are summarized by areas of the plant. Cost centers include well field operations, water treatment plant, process plant operations, and the General and Administration area.

Process operating costs were estimated for the life of the operation based on an annual production goal of 55.5 million pounds of copper per year (mppy) in the first five years of operation and 85 mppy for subsequent years. The well field costs are based on design rates of leach solution injection and recovery at approximately 7,400 gpm each in the first five years and 11,000 gpm each in subsequent years. Water treatment costs are estimated at $0.09/lb of copper produced.

21.1.1 Well Field Operating Costs

Well field operating costs include estimates of labor, power, reagents, maintenance, and supplies and services for the operation of the well field and water treatment plant in the well field area to neutralize, treat, and evaporate excess process solutions.

The cost of labor is based on wages and benefits for the labor force designated for well field operations.

Power costs were derived by applying power consumption rates for individual wells to the amount of well field pumping prescribed by the extraction plan. These power costs include PLS extraction, hydraulic control pumping, and extraction of groundwater during rinsing.

Reagents include lime consumption in the water treatment plant and acid additions in the well field and Tankhouse. Acid consumption is estimated on the basis of predicted additions necessary to fortify the leach solution prior to injection. Lime consumption is based on the predicted volume and quality of excess water necessary for neutralization and treatment, as provided by ARCADIS.

Maintenance is estimated based on labor, supplies, and outside services necessary to maintain the wells. This includes moving the well field pumps and piping, and replacing and repairing submersible pumps used for extraction. Supplies and services include fuel for the maintenance vehicles, tools and supplies, and other services necessary to maintain the well field pumps, piping, containment system, and road network within the well field. A summary of the well field costs is provided in Table 21-1 below.

Table 21-1: Well Field Operating Cost

	LOM Cost	$/lb Cu
Processing Units LOM (Cu lb)	**1,695,000,000**	
Well Field		
Operating Labor and Fringes	$24,000,000	$0.01
Power	$42,000,000	$0.03
Reagents	$422,000,000	$0.25
Maintenance	$87,000,000	$0.05
Supplies and Services	$5,000,000	$0.00
Total Well Field	**$580,000,000**	**$0.34**

The costs are in fourth quarter 2011 US dollars. Prices for reagents such as sulfuric acid and lime were based on market studies and vendor quotations obtained for this study. This estimate includes assumed prices for commodities such as fuel, parts, etc. that are subject to wide variations depending on market conditions. The current estimate is based on the following estimated prices for key commodities.

- Extractant delivered to the site for $34.48 per gallon.
- Electrical power at $0.07 per kWh.
- Sulfuric acid delivered at $120 per ton.
- Lime delivered at $165 per ton.

21.1.2 Process Plant Operating Costs

Process Plant operating cost for the Life of Operation is estimated to average $0.25 per pound of copper. The table below shows the operating cost for the life of the operation.

Table 21-2: Process Plant Operating Cost

	LOM Cost*	$/lb Cu
Processing Units LOM (Cu lb)	**1,695,000,000**	
Solvent Extraction		
Operating Labor and Fringes	$5,000,000	$0.00
Power	$2,000,000	$0.00
Reagents	$185,000,000	$0.11
Maintenance	$14,000,000	$0.01
Supplies and Services	$1,000,000	$0.00
Subtotal Solvent Extraction	***$206,000,000***	***$0.12***
Tank Farm		
Operating Labor and Fringes	$5,000,000	$0.00
Power	$3,000,000	$0.00
Maintenance	$10,000,000	$0.01
Supplies and Services	$1,000,000	$0.00
Subtotal Tank Farm	***$18,000,000***	***$0.01***
Electrowinning		
Operating Labor and Fringes	$12,000,000	$0.01
Power	$98,000,000	$0.06
Maintenance	$40,000,000	$0.02
Supplies and Services	$6,000,000	$0.00
Subtotal Electrowinning	***$156,000,000***	***$0.09***
Ancillary Services		
Operating Labor and Fringes	$18,000,000	$0.01
Power	$2,000,000	$0.00
Maintenance	$16,000,000	$0.01
Supplies and Services	$1,000,000	$0.00
Subtotal Ancillary Services	***$37,000,000***	***$0.02***
Total Process Plant	***$417,000,000***	***$0.25***

*Summation discrepancies are due to rounding.

21.1.2.1 Labor

Process labor costs were derived from a staffing plan provided by Curis based on Arizona wages and benefits. Labor rates and fringe benefits for employees include all applicable social security benefits as well as all applicable payroll taxes.

21.1.2.2 Power

Power costs were based on obtaining power from Arizona Public Service (APS) at a cost of $0.07 per kWh (P&R Consulting, 2012). The cost estimate is based on a time-of-use rate (E-35) and an estimated load factor of 80%. Power consumption was based on the equipment list connected loads, discounted for operating time per day and anticipated operating load level.

21.1.2.3 Reagents

Consumption rates were determined from the metallurgical test data or industry practice. Budget quotations were received for reagents supplied to the project site.

21.1.2.4 Maintenance Wear Parts and Consumables

Wear parts and consumables are based on industry practice for SX/EW operations. An allowance was made to cover the cost of maintenance of all items not specifically identified and the cost of maintenance of the facilities. The allowance made was 5.0% of the direct capital cost of equipment.

21.1.2.5 Process Supplies & Services

Allowances were provided in the process plant for outside consultants, outside contractors, vehicle fuel, and miscellaneous tools and supplies. The allowances were estimated using historical information from similar SX/EW operations and projects.

21.1.3 Water Treatment

ARCADIS developed water treatment costs for non-process flows, including raffinate bleed water, hydraulic control water, and rinse solutions pumped from depleted blocks. Water treatment costs are divided into three rates based on the projected chemistry and flow rate projected for each of three time periods. In the first four years of production, water treatment involves neutralization and evaporation of a relatively low volume of flow, approximately 250 gpm and is estimated to average $5.78 per thousand gallons. In Years 5-10 the flows increase due to the addition of formation rinsing to the influent stream. The particulate filtration and nanofiltration or reverse osmosis are added to the treatment train at this time to permit some of the treated water to be used for formation rinsing. The cost for water treatment in this time period is estimated to average $7.07 per thousand gallons. In Year 11, additional capacity is added to accommodate higher flow volumes required by the rinsing schedule. The costs for water treatment during this time period is estimated to decline to an average of $6.42 per thousand gallons, largely due to the increase in volume treated.

Primary operating cost items include power, lime, polymer, chemicals, maintenance and repair, and labor. Lime for neutralization of the treated flow streams accounts for the majority of the operating cost. Lime consumption rates were based on the estimated chemistry of the combined flow streams influent to the water treatment system at each of the time periods. Lime consumption rates are estimated to average 13 tpd in the first 4 years (97% of total costs), 81 tpd for Years 5 to 10 (87% of total costs), and 147 tpd for years 11 to 27 (87% of total costs). Lime costs for the project of $165 per ton were based on a market survey by Steven Lowe of Mine Logistics and Procurement. Power is a secondary cost driver, rising from less than 1% of total cost to approximately 10% of projected costs, as the nanofiltration/reverse osmosis is added to the treatment train. Power costs were estimated at $0.07/kWh, based on an analysis of the current rate structure (P&R Consulting, 2012).

21.1.4 General Administration

G&A costs include labor and fringe benefits for the administrative personnel, human resources, and accounting. Also included are office supplies, communications, insurance, and other expenses in the administrative area. Labor costs for G&A are based on a staff of 61. The staff includes 23 for management and administration, 12 for accounting and purchasing, and 26 for technical and environmental. All other G&A costs were developed as allowances based on historical information from other operations and other projects. The life of operation operating average estimated to be $0.12 per pound of copper shown in Table 21-3.

Table 21-3: General Administration Operating Cost

Cost Item	LOM Cost	$/lb.*
Processing Units LOM (Cu lb)	**1,694,700,000**	
Labor & Fringes	$124,600,000	$0.07
Accounting (excluding labor)	$600,000	$0.00
Safety & Environmental (excluding labor)	$600,000	$0.00
Human Resources (excluding labor)	$600,000	$0.00
Security (excluding labor)	$600,000	$0.00
Assay Lab (excluding labor)	$6,900,000	$0.00
Office Operating Supplies and Postage	$1,000,000	$0.00
Maintenance Supplies	$600,000	$0.00
Natural Gas	$900,000	$0.00
Communications	$1,800,000	$0.00
Small Vehicles	$3,000,000	$0.00
Claims Assessment	$300,000	$0.00
Legal & Audit	$7,500,000	$0.00
Consultants	$3,500,00	$0.00
Janitorial Services	$1,300,000	$0.00
Insurances	$45,800,000	$0.03
Subs, Dues, PR, and Donations	$1,500,000	$0.00
Travel, Lodging, and Meals	$3,500,000	$0.00
Recruiting/Relocation	$2,800,000	$0.00
Total General & Administrative Cost	**$207,600,000**	**$0.12**

*Any mathematical discrepancies are the result of rounding.

21.2 CAPITAL COST

21.2.1 Basis of Capital Cost Estimate

Capital costs for the project were estimated using budgetary equipment quotes, material take-offs for concrete, steel, and earthwork, estimates from vendors and subcontractors for such things as pre-engineered buildings and production wells, and estimates based on experience with similar projects of this type. Some of the costs and quantity estimates used by M3 were supplied by other consultants.

- KP provided quantities associated with earthmoving, construction, and fencing on process ponds.

- Haley and Aldrich provided quantities and timing of wells for the ISCR well field.

- ARCADIS provided designs and cost estimates for the water treatment plant.

- Haley & Aldrich provided the cost estimate for reclamation.

- Arizona Public Service Company provided a cost estimate for completing electrical transmission lines to the plant substation and furnishing a transformer.

- Southwest Natural Gas provided a cost estimate for providing natural gas to the site boundary and installing gas lines in customer-dug trenches to two service points on the site.

The capital cost estimates include both initial capital and sustaining capital for the project. Initial capital is defined as all capital costs through the end of construction. Capital costs predicted for later years are carried as sustaining capital in the financial model. Sustaining capital costs include well field construction beyond the initial wells, planned expansion of the plant in Year 5 and expansion of water treatment facilities. Capital costs in US dollars are based on quotes obtained in 4th quarter 2011, escalated by 2% (based on data from Engineering News Record).

The accuracy of this estimate for those items identified in the scope-of-work is estimated to be within the range of ±20%. Contingencies are estimated to cover items of cost which fall within the scope of the project, but are not sufficiently characterized at the time the estimate is developed. M3 estimated the contingency at 20% of the direct and indirect costs (Contracted Cost).

21.2.1.1 Direct Costs

Site work quantities were estimated by KP for the water impoundments. Quantities for the PLS, raffinate, and runoff ponds were estimated by M3, based on KP designs. Other site work quantities were estimated using Autodesk's Land Development program for AutoCAD applied to preliminary facility layouts prepared by M3. M3 applied unit cost factors based on experience with similar projects.

Structural steel and concrete quantities for the process plant buildings were estimated using parametric factors collated from constructed projects and current construction designs for projects of a similar size and nature. Other areas were estimated from direct material take-offs from drawings of conceptual designs.

Concrete costs were estimated based upon an informal survey of current and recent projects in the Arizona.

Steel costs were based upon a recent large steel purchase for a mine plant of similar scale. Competitive bids were collected from the US, Canada, and Mexico for that project. M3 considers the resulting bid prices to be representative of world structural steel prices during the fourth quarter of 2011.

Architectural costs are based on M3 records of similar-sized projects for the electrowinning building. Pre-engineered building quotes were obtained for other major buildings, such as the warehouse and well field maintenance building.

Vendor budgetary quotes supplied cost data for major equipment, as defined by a comprehensive Equipment List prepared by M3 based on the flowsheets developed for the project. Major process plant equipment such as EW cells, settlers, tanks, pumps, filters, agitators, cranes, stripping machine, and major electrical components were priced from vendor budgetary quotations. Other equipment prices were based on M3's historical records including budgetary and equipment purchase pricing from recent, similar projects. Some historic records were scaled to correct for size, capacity difference, and price escalation. Installation costs are based on allowances for materials and M3's judgment and experience for labor. Over 85% of total well field and plant mechanical equipment cost came directly from 2011 vendor budgetary quotes for this or other projects.

Piping in most areas is estimated as a percentage of the mechanical equipment cost. The piping associated with the ISCR well field was estimated based on quantities derived from an M3 well field infrastructure layout. This includes primary HDPE piping and arterials from the process ponds to the well field, connection and collection piping with the well field, and piping connections to the water treatment plant for neutralization and treatment, recirculation, and evaporation of excess process water.

The instrumentation estimate is based on parametric factors collated from constructed projects and current construction designs for projects of a similar size and nature.

21.2.1.2 Indirect Costs

Indirect costs include such things as indirect field costs, mobilization costs, contractor fees, and freight costs. Contractor fees are included in the direct costs. These allowances are based on M3's experience on recent mine development projects that have gone to construction. Indirect costs estimated for this project include mobilization and freight.

Mobilization is calculated as 1% of Direct Costs without mobile equipment.

Freight allowance includes the following components.

- In-transit warehousing is 1% of total material and plant equipment cost.
- Freight is included at 7% of equipment and bulk material cost.
- Duties, Customs, and Taxes are included at 2% of total material and plant equipment costs.

The following taxes have been considered for this estimate:

- Sales tax is not included in the cost of equipment.

- Arizona Gross Receipts Tax is applied at 6.1%.

21.2.1.3 Working and Sustaining Capital Cost

Working capital is not included in the capital cost but is accounted for in the financial model (Section 22.4.3).

Sustaining Capital costs have been estimated on the same basis as the initial capital cost provided in the Capital Cost Estimate. The major components of sustaining capital are expansion of well field, expansion of the process plant and water treatment plant, and addition of process solution impoundments to manage water and sediments from the water treatment plant during rinsing operations. Sustaining Capital costs are applied in future years in the financial model, as described in Section 22.4.2.

21.2.2 Capital Cost Tabulation

Direct capital costs are shown in Table 21-4. Indirect and total capital costs are shown in Table 21-5.

Table 21-4: Direct Capital Costs

Plant Area	Description	Man Hours	Plant Equipment (Million)*	Material (Million)	Labor (Million)	Subcontract (Million)	Construction Equipment (Million)	Total (Million)
000	General	11,973	$0.0	$1.2	$0.8	$0	$0.6	$2.6
100	Wells	0	$0.0	$21.1	$12.3	$0	$1.8	$35.2
200	Well field Infrastructure	41,807	$3.1	$11.2	$2.5	$0	$0.6	$17.4
400	Solvent Extraction	38,802	$4.4	$4.3	$2.6	$0	$0.4	$11.7
500	Tank Farm	19,751	$4.0	$1.1	$1.2	$0	$0.2	$6.6
600	Electrowinning	43,696	$15.1	$3.1	$2.6	$0	$0.5	$21.4
650	Water Systems (Process, Fire, Potable)	17,865	$3.0	$1.0	$1.2	$0	$0.1	$5.3
700	Power Substation & Distribution	6,217	$0.5	$0.5	$0.5	$0	$0.1	$1.6
750	High Voltage Power	0	$0.0	$3.3	$1.8	$0	$0	$5.0
800	Reagents	11,739	$0.8	$1.0	$0.7	$0	$0.1	$2.6
900	Ancillaries	10,397	$0.5	$1.1	$0.7	$0	$0.1	$2.5
	Total Direct Capital Costs	**202,247**	**$31.4**	**$48.8**	**$27.1**	**$0**	**$4.4**	**$111.8**

*Any mathematical discrepancies are the result of rounding.

Table 21-5: Indirect Capital Costs

Indirect Cost Item	Cost (million)
Total Direct Field Costs	**$111.8**
Indirect Field Costs (1a)	$0
Camp & Busing Costs (1b)	$0
Mobilization (2)	$1.1
Fee - Contractor (3)	Included in Direct Cost
Freight (4)	$4.5
Total Constructed Cost	**$117.3**
EPCM Total (5,6,7,8,9,10)	$12.8
Total Contracted Cost	**$130.1**
Vendor Supervision of Specialty Construction (11)	$0.3
Vendor Precommissioning (11)	$0.1
Commissioning (11)	$0.1
Commissioning Spares (12)	$0.2
Capital Spares (13)	$0.6
Subtotal	**$131.4**
Contingency (14)	$37.6
Added Owner's Cost (15)	$15.3
Total Mine Capital Cost (16)	$0
Pre-Production (17)	$0
Arizona Gross Receipts Tax (18)	$1.9
Escalation (19)	$3.0
Total Evaluated Project Cost (20)	**$189.2**

NOTES:

1. Indirect Field Costs are allocated as follows:
    a. Field payroll burden and overhead (included in labor); field supervision, field supervisory burden, and support (included in labor); freight (included in equipment cost); and the estimated contractor field overhead cost (included in labor & unit rates).
    b. Camp and busing costs are included at $1.00 per hour for 50% of the labor and $3.00 per hour for 50% of the labor.
2. Mobilization 1% of Total Direct Cost.
3. Contractors' fee included in labor rate or unit cost.
4. Freight allowance included at the following percentages:
    a. Factory or In-Transit Warehousing included at 1% of total material and plant equipment cost.
    b. Freight included at 7% of total material and plant equipment cost.
    c. Duties, Customs, Taxes included at 2% of total material and plant equipment cost.
5. Management & accounting included at .75% of Total Direct Field Cost w/o High Voltage Power.
6. Engineering included at 6% of Total Direct Field Cost w/o High Voltage Power.
7. Project services included at 1% of Total Direct Field Cost w/o High Voltage Power.
8. Project control included at 0.75% of Total Direct Field Cost w/o High Voltage Power.
9. Construction Management included at 6.5% of Total Direct Field Cost w/o High Voltage Power.
10. Temporary Construction Costs included at 0.5% of Total Plant Equipment Costs.
11. Contractor commissioning crew, and vendor representatives are included at 1% of Process Equipment Cost.
    a. Supervision of Specialty Construction included at 1% of plant equipment costs.
    b. Precomissioning included at 0.3% of plant equipment costs.
    c. Comissioning included at 0.3% of plant equipment costs.
12. Comissioning Spare parts are included at 0.5% of equipment purchase costs (2 year spares Excluded)
13. Capital Spares included at 2% of total plant equipment cost.
14. Contingency included at 20% of Subtotal plus $11.3 million for Collar Casing Contingency (year -1).
15. Added Owners Cost allocated by Owner for land acquisition, permitting and environmental studies, owner's project administrative costs, mine development cost, and mine equipment cost, and operator training cost, and all other Owner's Costs are excluded from the estimate.
16. Total Mine Capital Costs to be provided by owner.
17. Pre-Production Costs to be provided by owner (Approximately $19 million; not included in this table).
18. AZ Gross Receipts Tax is not applied to Plant Equipment and is calculated at 7.7% of 65% of Labor, Materials, and Subcontracts.
19. All costs are end of 3rd quarter 2012 dollars with 2% escalation added.
20. Total Evaluated Project Cost is projected to be in the range of -10% to +25%.

22 ECONOMIC ANALYSIS

The financial evaluation presents the determination of the Net Present Value (NPV), payback period (time in years to recapture the initial capital investment), and the Internal Rate of Return (IRR) for the project. Annual cash flow projections were estimated over the life of the operation based on the estimates of capital expenditures and production cost and sales revenue. The sales revenue is based on the production of a copper cathode. The estimates of capital expenditures and site production costs have been developed specifically for this project and have been presented in earlier sections of this report.

22.1 WELL FIELD STATISTICS

Well field production is reported as soluble copper removed from the ISCR leaching operation. The annual production figures were obtained from the extraction plan as shown earlier in this report.

22.2 PLANT PRODUCTION STATISTICS

The design basis for the process plant is a nominal flow of 11,000 gpm (7,400 gpm, initially) of PLS at an average concentration of 1.8 g/L recovered at the SX Plant. The average feed Cu concentration to the SX Plant is 2.0 g/L for the life of operation. Average annual full-rate production is projected to be approximately 85 million pounds. Total life of operation production is projected at approximately 1,700 million pounds of copper.

22.3 COPPER SALES

The copper cathodes are assumed to be shipped to buyers in the US market, with sales terms negotiated with each buyer. The financial model assumptions are based on experience with copper sales from similar operations in the US.

The company has committed 25% of its copper production at market terms for the life of mine to RK Mine Trust I pursuant to an outstanding 2 year Bridge Loan facility. If the Bridge Loan facility is extended to 3 years, the off-take commitment to RK becomes 30%.

22.4 CAPITAL EXPENDITURE

Capital expenditures for this project include the construction of the in-situ copper recovery (ISCR) well field and solution extraction/electrowinning (SX/EW) plant. Initial capital items include expenditures that are necessary to bring the plant into production. The estimated initial capital is $189 million (not including pre-production costs), as presented in Section 21.2.2. Sustaining capital items include construction of additional water impoundments and ISCR wells, expansion of the water treatment plant, and replacement of capital equipment and are estimated to be $627 million.

22.4.1 Initial Capital

The financial indicators have been determined with 100% equity financing of the initial capital. Any acquisition cost or expenditures, such as property acquisition, permitting, and study costs, prior to project authorization have been treated as "sunk" cost and have not been included in the analysis.

The total initial capital carried in the financial model for new construction and pre-production well field development is expended over a 3-year period and shown in Table 22-1 (see Section 21.2.2 for more detail on the capital cost estimate). The initial capital includes Owner's costs and contingency. The capital will be expended in the years before production and a small amount carried over into the first production year.

Operating expenses will be incurred prior to initial copper production. These expenses include the cost of circulating leach solution in the well field for several months before the concentration of copper in the solution is high enough to support the SX/EW operation. These Pre-Production Costs will be supported from the start-up capital for the operation, and therefore are included in Table 22-1 as part of the Initial Capital Requirement. These are technically operations costs and are accounted as such in the financial model.

Table 22-1: Initial Capital Requirement

	Cost
Well field	$54,000,000
SX-EW Plant	$66,000,000
Utility, Infrastructure, and Ancillaries	$54,000,000
Owner's Cost	$15,000,000
Initial Capital Cost	**$189,000,000**
Pre-Production Costs	$19,000,000
Total	**$ 208,000,000**

22.4.2 Sustaining Capital

A schedule of capital cost expenditures during the production period was estimated and included in the financial analysis under the category of sustaining capital. The total life of operation sustaining capital is estimated to be $627 million. This capital will be expended during a 22-year period and consists of $512 million for well installation and equipping, $28 million for well field infrastructure development, $7 million for cultural resource mitigation, $7 million for plant expansion in Year 5, and $72 million for water treatment system expansion and construction of process water management impoundments.

22.4.3 Working Capital

A 15-day delay of receipt of revenue from sales is used for accounts receivables. A delay of payment for accounts payable of 30 days is also incorporated into the financial model. In addition, working capital allowance of approximately $3 million for plant consumable inventory is estimated over Year -1 and Year 1. All the working capital is recaptured at the end of the mine life and the final value of these accounts is zero.

22.5 REVENUE

Annual revenue is determined by applying estimated metal prices to the annual payable metal estimated for each operating year. Sales prices have been applied to all life of operation production without escalation or hedging. The revenue is the gross value of payable metals sold before treatment charges and transportation charges. The copper prices used in the evaluation are $3.50/lb. for the first three years and $2.75/lb. for subsequent years. These copper prices reflect the average short and long term price forecasts from a broad selection of commodity analysts and investment banks.

22.6 TOTAL OPERATING COST

The average Cash Operating Cost over the life of the operation is estimated to be $0.80 per pound of copper produced, excluding the cost of the capitalized pre-production leaching. Cash Operating Cost includes well field operations, process plant operations, water treatment, and general administrative cost. Table 22-2 below shows the estimated operating cost by area per pound of copper produced.

Table 22-2: Life of Operation Operating Cost

Operating Cost	$/lb. Cu*
Well field	$0.34
SX-EX Plant	$0.25
Water Treatment	$0.09
General Administration	$0.12
Total Operating Cash Cost	**$0.80**
Royalties, Incidental Taxes (excludes Income Taxes), Reclamation, and Misc.	$0.31
Total Cash Cost	**$1.11**

*Note: Any summation discrepancies are due to rounding.

22.7 TOTAL CASH COST

Total Cash Cost is the Total Operating Cost plus royalties, property and severance taxes, and reclamation and closure costs. The average Total Cash Cost over the life of the operation is estimated to be $1.11 per pound of copper produced, which is shown above.

22.7.1 Royalty

There are three entities that are entitled to royalties: the State of Arizona, Conoco, and BHP. State royalties are paid on copper produced from the State Mineral Lease portion at the rate of 8% of the produced copper. Conoco royalties are paid at the rate of 2% of the value of copper produced on State Land and 3% of the value of copper produced off State Land. BHP royalties are paid at the rate of 2.5% of "net profits," defined as cumulative revenue – cumulative costs, where cumulative costs include all capital and operating costs, royalties, taxes other than income taxes and $0.01/lb for reclamation.

Royalties for the life of the operation are estimated at $339 million and average $0.20 per pound of copper recovered. Royalties estimated include $162 million payable to the State, $123 million payable to Conoco, and $54 million payable to BHP.

22.7.2 Property and Severance Taxes

Property and severance taxes are estimated to be $111 million and average $0.07 per pound of copper recovered. Property taxes were estimated to be $70,000 per year during construction and average approximately $4 million per year during production, totaling $74 million for the life of the operation. Severance taxes are calculated as 2.5% of net proceeds before taxes from mining. Severance taxes are estimated to be approximately $37 million for the life of the operation.

22.7.3 Reclamation and Closure

Reclamation and closure costs include well abandonment costs for core holes and production wells, closure of process water impoundments, demolition of processing facilities and ancillary structures, and restoration of the land surface to pre-development conditions. Core hole and well abandonment costs were estimated by applying estimates from drilling contractors to quantities provided in the extraction plan. Plant closure and reclamation costs were estimated as detailed in Section 20.5. The total cost for reclamation and closure is estimated to be $39 million and averages $0.02 per pound of copper recovered.

The reclamation and closure costs estimated here are not equivalent to the reclamation costs shown in Table 20-5. Those costs were formulated to represent the cost of closing and land restoration following cessation of production for purposes of reclamation bonding. Those costs included the rinsing and abandonment of wells in the post-production period, which are included as operating costs in the financial model.

Concurrent reclamation costs, that is those reclamation and closure costs that occur before or during the production period, are included in the above. The costs of rinsing spent ore blocks, abandonment and closure of production wells, and abandonment of existing core holes in the deposit area prior leaching are included in the reclamation and closure costs reported here. These costs do not include the costs of rinsing and water treatment for any of the wells included in the extraction plan. However, the decommissioning of process facilities and operational infrastructure, closure of process ponds, and restoration of the land surface to its pre-mining condition as presented in Table 20-5 are included in this estimate of reclamation and closure cost.

22.8 INCOME TAXES

Taxable income for income tax purposes is defined as metal revenues minus operating expenses, royalty, property and severance taxes, reclamation and closure expense, depreciation and depletion.

Income taxes are estimated by applying state and federal tax rates to taxable income. The primary adjustments to taxable income are tax depreciation and the depletion deduction. Income taxes estimated in this manner total $592 million for the life of the project and were provided by Curis and Curis' tax consultant.

22.9 PROJECT FINANCING

The project was evaluated on an unleveraged and un-inflated basis.

22.10 NET CASH FLOW AFTER TAX

Net cash flow after all operating costs, capital costs and income taxes is estimated to be $1,488 million.

22.11 NPV AND IRR

The economic analysis before taxes indicates an Internal Rate of Return (IRR) of 36% and a payback period of 2.6 years. The Net Present Value ("NPV") before taxes is $727 million at a 7.5% discount rate. The economic analysis after taxes indicates that the project has an IRR of 29% with a payback period of 3.0 years. The NPV after taxes is $503 million at a 7.5% discount rate.

Table 22-3 compares the sensitivity of financial indicators when the metal recovery percentage changes.

Table 22-3: Sensitivity to Metal Recovery Percentage

	Recovery Sensitivity		
	63%	70%	75%
Years of Commercial Production	23	25	26
Total Copper Produced (lbs)	1,510,000,000	1,695,000,000	1,830,000,000
LOM Copper Price (avg $/lb)*	$2.83	$2.82	$2.81
Initial Capital Costs	$217,000,000	$208,000,000	$204,000,000
Payback of Capital (pre-tax/post-tax)	2.7/3.2	2.6/3.0	2.5/2.9
Internal Rate of Return (pre-tax/post-tax)	34%/28%	36%/29%	38%/31%
Life of Mine Dire ct Operating Cost ($/pound Cu Recovered)	$0.83	$0.80	$0.77
Life of Mine Total Produ ction Cost ($/pound Cu Recovered)	$1.14	$1.11	$1.08
Pre-tax NPV at 7.5% discount rate	$643,000,000	$727,000,000	$796,000,000
Post-tax NPV at 7.5% discount rate	$440,000,000	$503,000,000	$552,000,000
Total Number of Years of Production on Arizona State Land	12	13	13
*Copper price assumptions are based on consensus pricing from a broad selection of commodity analysts and investment banks and are $2.75/lb long term and $3.50/lb during the first 3 years of production.			

The impact of higher copper prices was investigated using the financial models for all three of the above copper recovery projections. Table 22-4 compares key financial parameters using a long term price of $2.75 per pound for copper versus $3.00 per pound; in both analyses a price of $3.50 per pound has been assumed during the first 3 years of production. As expected, the higher copper price increases the NPV and IRR for each recovery scenario.

Table 22-4: Copper Price Sensitivity

	Low Recovery		Base Case Recovery		High Recovery	
	$2.75/lb	$3.00/lb	$2.75/lb	$3.00/lb	$2.75/lb	$3.00/lb
Production Statistics						
SX Flow Rate (gpm)	7,586	7,586	8,347	8,347	5,986	5,986
SXEW PLS (g/l)	1.74	1.74	1.85	1.85	2.68	2.68
Recovered Copper (klbs)	1,509,832	1,509,832	1,694,704*	1,694,704*	1,829,775	1,829,775
Economic Indicators before Taxes						
LOM Copper Price (avg $/lb.)	$2.83	$3.05	$2.82	$3.04	$2.81	$3.04
Revenues ($000)	$4,265,895	$4,605,401	$4,774,633	$5,160,243	$5,147,923	$5,566,686
Capital Expenditures						
Initial Capital ($000)	$198,107	$198,107	$189,197	$189,197	$185,335	$185,335
Sustaining Capital ($000)	$624,583	$624,583	$626,605	$626,605	$630,689	$630,689
Operating Cost						
Wellfield Cost ($/lb.)	$0.350	$0.350	$0.342	$0.342	$0.339	$0.339
SXEW Cost ($/lb.)	$0.253	$0.253	$0.246	$0.246	$0.229	$0.229
Water Treatment Plant ($/lb.)	$0.102	$0.102	$0.089	$0.089	$0.081	$0.081
General Administration Cost ($/lb.)	$0.126	$0.126	$0.122	$0.122	$0.117	$0.117
Other Expense	$0.306	$0.324	$0.309	$0.336	$0.312	$0.339
Total Cash Cost ($/lb)	$1.137	$1.16	$1.108	$1.135	$1.077	$1.105
NPV @ 7.5% ($000)	$643,039	$757,000	$727,310	$848,000	$796,280	$921,000
IRR %	33.6%	35.8%	35.8%	37.9%	37.7%	40%
Payback - years	2.7	2.7	2.6	2.6	2.5	2.5
Economic Indicators after Taxes						
NPV @ 7.5% ($000)	$440,224	$517,000	$502,864	$585,627	$552,355	$637,000
IRR %	27.6%	29%	29.4%	31.2%	30.9%	33%
Payback - years	3.2	3.2	3.0	3.0	2.9	2.9

*Excludes the 3 million pounds extracted during Phase 1 PTF work.

Table 22-5 compares the base case project financial indicators with the financial indicators when other different variables are applied. By comparing the results it can be seen that fluctuation in the copper price has the most dramatic impact on project economics. Fluctuation in the initial capital cost has the least impact on project economic indicators.

Table 22-5: After-Tax Sensitivities (Copper Price, Operating Cost and Initial Capital Cost)

Copper Price			
	NPV @ 7.5%	IRR %	Payback (years)
Base Case	$ 503,000,000	29%	3.0
20%	$ 730,000,000	38%	2.5
10%	$ 616,000,000	34%	2.7
-10%	$ 388,000,000	25%	3.9
-20%	$ 271,000,000	20%	5.2
Operating Cost			
	NPV @ 7.5%	IRR %	Payback (years)
Base Case	$ 503,000,000	29%	3.0
20%	$ 437,000,000	27%	3.4
10%	$ 470,000,000	28%	3.2
-10%	$ 535,000,000	31%	2.9
-20%	$ 567,000,000	32%	2.8
Initial Capital			
	NPV @ 7.5%	IRR %	Payback (years)
Base Case	$ 503,000,000	29%	3.0
20%	$ 479,000,000	26%	3.7
10%	$ 491,000,000	28%	3.3
-10%	$ 514,000,000	32%	2.8
-20%	$ 525,000,000	34%	2.6

Figure 22-1 to Figure 22-3 show the sensitivities graphically.

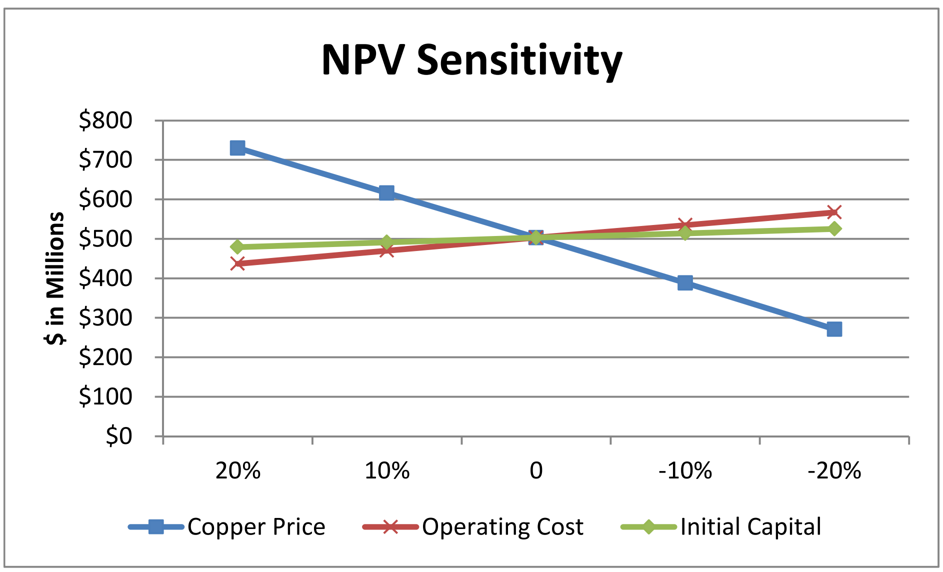


Figure 22-1: NPV Sensitivity Graph

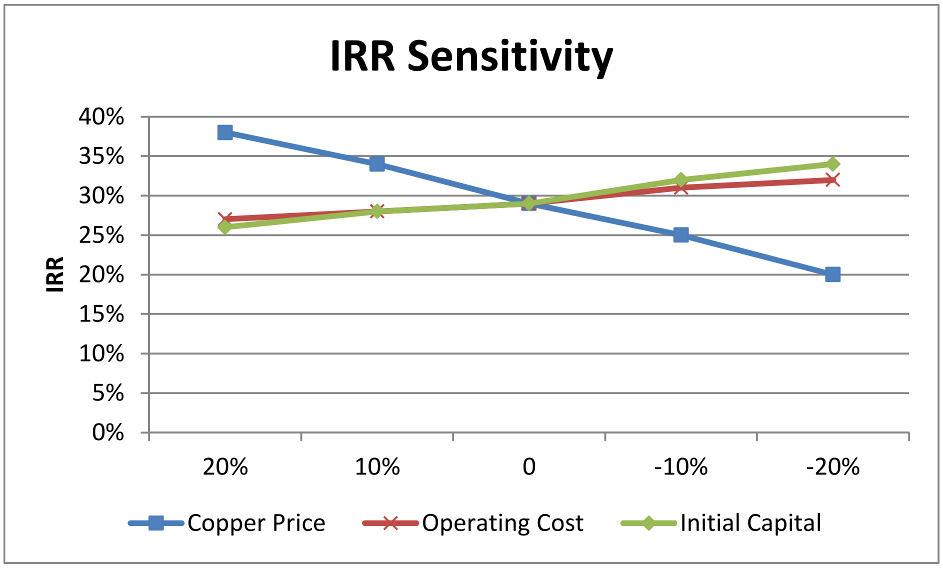


Figure 22-2: IRR Sensitivity Graph

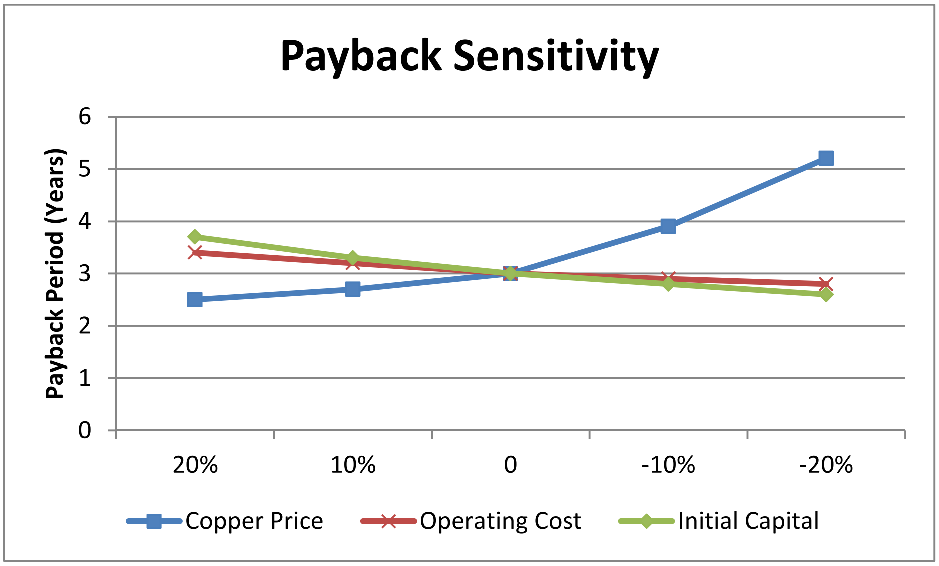


Figure 22-3: Payback Period Sensitivity Graph

23 ADJACENT PROPERTIES

There are no metal mining operations or properties near the FCP site. Adjacent properties consist of undeveloped desert, agricultural production (cotton, alfalfa, maize), and open-pit sand and gravel operations. A relatively large sand and gravel operation is located to the south-southeast on the north side of the Gila River, less than a mile from the FCP site. Future residential and industrial development is planned for areas to the north and west of the FCP site. However, there are constraints on residential and industrial development as the property is surrounded by an active rail line (Copper Basin Railway), a major highway (Hunt Highway), and extensive electrical (500 KV and 125 KV) transmission infrastructure.

24 OTHER RELEVANT DATA AND INFORMATION

There are no other relevant data and information that are not already contained within this Technical Report.

25 INTERPRETATION AND CONCLUSIONS

The FCP is a shallowly buried porphyry copper deposit that is amenable to in-situ copper recovery ("ISCR") and SX/EW copper production. The probable mineral reserves at a 0.05% Total Copper ("TCu") cutoff are as follows:

Tons	339,953,000
TCu Grade (%)	0.358
Contained Copper lb	2,435,400,000
Average Recovery (%)	69.7
Extracted Copper Pounds	1,698,000,000

Notes:

1. *Reserves are stated within the economic resource boundary depicted in Figure 15-1. There are no Proven reserves. Measured and Indicated resources were converted to Probable reserves.*
2. *Approximately 3 million pounds of the probable reserves are expected to be recovered from Phase 1 production testing prior to the operation of the commercial plant envisaged in this study.*

Previous owners conducted drilling on a nominal 250-foot drill spacing sufficiently characterized the copper oxide mineralization, and allow for current and CIM-compliant resource estimation and classification. The nature and quantity of copper mineralization were confirmed in representative portions of the deposit through Curis Arizona's 2011 drilling program. This drilling program and other technical studies have adequately characterized the hydrological and metallurgical characteristics of the deposit. The project data are sufficient to form the basis for ISCR extraction plan and SX/EW copper production.

25.1 CONCLUSIONS

Based on the existing project data, and input from Curis Arizona and independent consultants working for Curis Arizona, a conceptual ISCR well field production schedule for life-of-mine development has been prepared with estimated costs of development, operation, and closure. Based on the production schedule and estimated copper recovery from metallurgical test data, approximately 55 million ramping up to 85 million pounds of copper per year can be recovered by ISCR well field methods. M3 has used industry available information to appropriately size and cost an SX/EW copper recovery plant to be constructed on the property for planned cathode copper production as saleable product.

M3 has completed this Pre-Feasibility Study of the potential ISCR viability of the project, utilizing industry standard criteria for Pre-Feasibility-level studies. The results of this study indicate that ISCR development of the FCP offers the potential for positive economics based upon the information available at this time.

The base case economic analysis results indicate an after-tax NPV of $503 million at a 7.5% discount rate with an IRR of 29%. Payback will be in Year 3 of production in a projected 25-

year mine-life. The economics are based on a base case of $2.75/lb long-term copper price, and an initial design copper production rate of 55.5 mppy, increasing to 85 mppy in Year 5. Direct operating costs are estimated at $0.80/lb of copper. Total capital costs are estimated at $835 million, consisting of initial capital costs of $189 million (plus $19 million of pre-production costs), and ongoing sustaining capital over the life of operations of $627 million.

As with any pre-development property, there are risks and opportunity attached to the project that need further assessment as the project moves forward. M3 deems those risks, on the whole, as identifiable and manageable.

25.2 PROJECT RISKS

Risks for this project are of three major types, as is typical for any prospective mineral extraction project. The most onerous of the risk factors are those which prevent the development of the project. Another set of factors has to do with delays in the project timeline that increase the cost of development and render capital formation for the project more difficult. The third set of risks involves increasing costs.

1. **Precluding Project Success.** Risks that would preclude the success of the project include the inability to permit the project and failure of the process. The risk of either factor for this project is considered to be low due to the following:

    a. The project was granted the necessary permits in the 1990s.
    b. The permitting process for the Phase 1 PTF is on track for approval in the first half of 2013.
    c. Once the success of the PTF is demonstrated, there should be no obstacles to obtaining the additional and amended permits for Phase 2.
    d. SX/EW technology is proven, providing very low risk of failure.
    e. While the ISCR process has not been demonstrated on a commercial scale as a stand-alone project, the in-situ recovery process has been used for decades in association with open pit and underground copper mining, solution mining (uranium, potash, sodium bicarbonate and salt) and groundwater restoration projects has proved to be highly successful.

2. **Project Delays.** The risk presented by delays to the project is also deemed to be low due to the following:

    a. The State of Arizona is supportive of the development of the project because it will provide significant employment and royalty, property, sales, and income revenues for the State.
    b. An APP for Phase 1 operations has been secured and is currently undergoing administrative review.
    c. Successful demonstration of the technology and hydraulic control in the PTF should pave the way for rapid approval of the Phase 2 development of the project.
    d. A small risk of delay is associated with a change in political leadership in the State or effective opposition at the Federal level.

   e. There is also a risk of delay depending on the final resolution of current or future legal actions relating to or affecting the FCP.

3. **Profitability Impact.** The group of risks which have a chance to negatively impact the profitability of the project involve well field issues and water treatment issues. These risks are broken down as follows:

   a. Several potential impacts are associated with the well field in terms of well construction and well field operation. The oxide mineralized body is highly fractured and incompetent, complicating the process of drilling and well installation. It may be difficult to maintain an open borehole during drilling and installation of the well screen, casing, and formation stabilizing filter pack. Until the proposed drilling and well installation designs and methods are demonstrated in the PTF, there is a risk that the techniques necessary to overcome these obstacles could be more expensive than anticipated for the cost estimates used in this study. Drilling productivity could be significantly impacted and a high failure rate in well construction would increase the costs, if it were higher than the 5% failure rate included in the financial models. If fouling of injection wells becomes a problem, costs to rehabilitate or replace wells, which are not included in this study, would add to the cost of production.

   b. Another well field problem that could increase cost and decrease copper production includes incomplete leaching of the oxide mineralization due to lack of fracturing in a local volume.

   c. There are several risks that involve rinsing and water treatment that could increase the cost of the project. The ability to treat the water extracted from rinsing depleted mineralized material blocks and re-inject it for further rinsing is one of the assumptions used in this Pre-Feasibility Study. The cost of such treatment and the ability of the system to provide treated water at a quality that is effective in rinsing the depleted blocks are assumed for purposes of this study. Significant increases in cost or the inability to treat to sufficiently high quality could impact the profitability of the project.

25.3 PROJECT OPPORTUNITIES

Several opportunities for increases in productivity and revenue or lowering costs have been identified which would increase the viability and profitability of the project. In general, this project's cost estimates have been conservative. Performance in some of these areas has the likelihood of exceeding the conservative estimates thereby increasing production or lowering costs. Several specific factors can be identified that would enhance the economics of the project.

- Improvements in the techniques used to drill and install wells could reduce the cost of well installation over the life of the project. Well installation costs amount to approximately 65% of the projected capital costs for the project.

- Optimization of the well spacing will be evaluated with data from the PTF. Increased well spacing would mean fewer wells consequently lowering the sustaining capital cost for the project. Operator experience in different resource blocks over the life of operation is expected to optimize well spacing distances.
- Water treatment costs and assumptions are based on neutralizing the excess raffinate “bleed stream” that is removed to compensate for water and acid additions to the process. Potential operational savings could be realized if the bleed stream was used to precondition advanced mineralized material blocks or if the acid could be recovered prior to neutralization.
- The water treatment conceptual design stipulates that the reverse osmosis reject stream is discharged to the process water impoundments for settling of solids and evaporation of liquids. The density of solids produced by this process is estimated to be rather low. In addition, the amount of water for evaporation exceeds the excess water produced by hydraulic control pumping and process make-up additions. Process improvements to the water treatment design could result in a higher density of sediment and a lower volume of water requiring evaporation. Reductions in sediment volume due to higher densities could result in reducing process water impoundment construction costs. Reductions in water volume for evaporation would reduce evaporation costs and the cost of supplying make-up water for rinsing.

Another opportunity for this project is the possibility of treating the excess process, hydraulic control, and rinse waters to a quality that would be acceptable for a beneficial use, such as irrigation. An irrigation canal bisects the deposit and would be an ideal vehicle for transmitting the treated waste water to potential customers. Beneficial use could reduce the cost of water treatment and reduce the amount of water that would need to be evaporated.

26 RECOMMENDATIONS

The FCP appears to be a viable project at the Pre-Feasibility stage and the authors recommend that additional work be conducted to take the evaluation to the feasibility level. Several aspects of the project design require additional work to bring them up to the feasibility level. There are other aspects of the project that should be advanced to increase the economic viability of the project and provide assurances that the project can be executed as planned.

26.1 WATER TREATMENT

The FCP is currently being permitted as a "zero discharge facility" meaning that no process waters are permitted to be discharged to the land surface or to the subsurface. The water from hydraulic control, the "bleed stream" from the solvent extraction/electrowinning (SX/EW) plant, and water used to rinse depleted blocks after leaching must be treated by neutralization of acid, precipitation of dissolved solids, and evaporation of surplus water. Surplus water is generated by make-up water in the process, hydraulic control pumping, and "reject" water from the water treatment plant.

A conceptual design with capital and operating cost estimates has been completed and is presented in this report (Section 21). The conceptual design envisages a three step process of high-density lime neutralization, filtration to remove high-density solids, and reverse osmosis or nanofiltration to remove dissolved solids to improve the quality of water to the level that permits its use as rinse water for the depleted blocks. In addition to the high-density sludge produced by lime neutralization, the reverse osmosis process produces a reject stream that contains approximately 3% solids. The solid and liquid wastes produced by this process must be contained in double-lined process water impoundments. Excess water in the impoundments is evaporated using mechanical evaporators to enhance the natural evaporation capacity of the arid climate in which the project is located.

The details of the water treatment process need to be worked out in order to advance this aspect of the project to a feasibility level. This work should include developing a process flow diagram and water balance, more specific information on the equipment used to accomplish the objectives, and a feasibility-level capital and operating cost estimate. Water and sediment management issues must be worked out to determine the number of process water impoundments that must be operational at each phase of the operation to achieve the sediment density goals. This work should include plans and costs associated with pond closure and reclamation.

26.2 METALLURGICAL TESTING

Continued metallurgical testing is recommended to verify the interactions between the leach solution and the mineralized material on longer flow paths. The majority of testing conducted to date has been on boxes of core with a few feet of distance along the flow paths. The proposed flow paths are 70 feet at minimum from injection to extraction wells. Studying the interaction between the leaching solution and mineralized material could provide valuable information about the reactions that take place along the flow path and could lead to techniques to avoid any problems discovered by this testing. Successful leaching of longer sections of mineralized material (as planned during PTF operations) will provide greater confidence that the copper production goals envisaged in this study can be achieved at a commercial scale.

26.3 OPTIMIZATION

Optimization studies are recommended to enable the in-situ copper recovery (ISCR) process to be operated in the most efficient manner. Fluid management is a key component to a large-scale leaching operation. There are numerous flow streams in the process including leach solution, pregnant leach solution (PLS), hydraulic control water, "bleed stream" of waste raffinate, neutralized "waste" water, water for rinsing, extracted rinsate, leach solutions to condition advancing blocks prior to extracting process-grade PLS, and groundwater extracted from advancing blocks prior to the arrival of the leaching "front." All these solutions must be managed with a few major piping arteries with minimal excess storage capacity in the process ponds. Plans should be formulated with the objective of making the best use of each flow stream available in order to accomplish the following.

- Maximize the use of acidic solutions
- Minimize the use of lime for neutralization
- Minimize the liquids for evaporation
- Maximize the density of sediments deposited in the process water impoundments
- Minimize the use of process make-up water from the water supply well

Well installation and equipping is the largest category of capital expense for the operation. Expanding the well spacing with the goal of minimizing the number of wells could be a significant factor in improving the economics of the project. Interwell aquifer test results from the PTF should be used to study the interaction of wells and provide data for numerical simulation of the flow dynamics in the well field. Information from metallurgical testing and data collected from the PTF could be incorporated into the analysis to identify a well spacing that maintains control of the solutions, provides rapid copper production, and minimizes the number of wells needed to produce the required copper for the SX/EW operation. Drilling and well installation experience from the PTF can be analyzed to optimize the well design to maximize construction efficiency and minimize well construction costs. Recommendations from the drillers and geologists monitoring drilling operations during PTF construction should be analyzed for their potential impacts on construction costs and potential impacts on solution management in the production well field.

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APPENDIX A: FEASIBILITY STUDY CONTRIBUTORS AND PROFESSIONAL QUALIFICATIONS

CERTIFICATE of QUALIFIED PERSON

I, Richard K. Zimmerman, R.G., do hereby certify that:

1. I am currently employed as Environmental Geologist by:

   M3 Engineering & Technology Corporation
   2051 W. Sunset Road, Ste. 101
   Tucson, Arizona 85704
   U.S.A.

2. I am a graduate of Carleton College and received a Bachelor of Arts degree in Geology in 1976. I am also a graduate of the University of Michigan and received a M.Sc. degree in Geology 1980.

3. I am a:

   - Registered Professional Geology in the State of Arizona (No. 24064)
   - Registered Member in good standing of the Society for Mining, Metallurgy and Exploration, Inc. (No. 3612900RM)

4. I have practiced geology, mineral exploration, environmental remediation, and project management for 32 years. I have worked for mining and exploration companies for 8 years, engineering consulting firms for 22 years, and for M3 Engineering and Technology Corporation for 2 years.

5. I have read National Instrument 43-101 (NI 43-101) and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

6. I have read the definition of “qualified person” set out NI 43-101 and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.

7. I am responsible for the preparation of Sections 2, 3, 17, 18, 21, 22, 25, 26, and 27 of the technical report titled “Florence Copper Project, NI 43-101F1 Technical Report, Pre-Feasibility Study” dated March 28, 2013 (the "Technical Report").

8. I have visited the site on several occasions, the most recent of which was January 9, 2012, but had no prior involvement with the property that is subject of the Technical Report.

9. As of the effective date of the technical report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information required to be disclosed to make the report not misleading.

10. I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101.

11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them of the Technical Report for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public.

Dated this 28th day of March, 2013

"Richard K Zimmerman" (signed and sealed)

Richard K Zimmerman, M.Sc., R.G., SME-RM No. 3612900RM
Name of Qualified Person

Qualified Person Certificate
Michael R. Young
minermike@yahoo.com

I, Michael R. Young, SME Registered Member (# 3594500), do herby certify that:

1. I was employed with Haley & Aldrich, 400 East Van Buren Street, Suite 545, Phoenix Arizona 85004 as Program Manager during the preparation of the Pre-Feasibility Study sections listed below.
2. I am a graduate of Texas A&M University with a Bachelor of Science degree in Mining Engineering, 1984.
3. I am a Registered Member (# 3594500) of the Society for Mining, Metallurgy, and Exploration.
4. I am a member in good standing of the Society for Mining, Metallurgy, and Exploration.
5. I have practiced my profession continuously for 25 years, 15 in industry and 10 in consulting, since my graduation from Texas A&M.
6. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101, the instrument), and certify that by reason of my education, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
7. I have personally visited the project area numerous times between February 2010 and October 2012. The most recent visit was on October 11, 2012.
8. I am responsible for sections 4, 5, 6, 15, 16, 19, 20.1, 20.3, 20.4, 20.5, and 24 of the technical report entitled: Florence Copper Project, NI 43-101F1 Technical Report, Pre-Feasibility Study dated March 28, 2013.
9. I, as a qualified person, I am independent of the issuer as defined in Section 1.5 of National Instrument 43-101.
10. I have read NI 43-101 and Form 43-101F1, and the technical report has been prepared in compliance with that instrument and form.

1. At the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report sections listed above contain all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Michael R. Young (Signed and Sealed)
Signature

March 28, 2013
Date

3275 W. Ina Road, Suite 240
Tucson, Arizona 85741

T: 520.544.3688
F: 520.544.9853

tucson@srk.com
www.srk.com

CERTIFICATE OF AUTHOR

I, **Corolla K Hoag**, a Registered Member-SME and Certified Professional Geologist, do hereby certify that:

1. I am employed as a Principal Geologist of:

   SRK Consulting (U.S.), Inc.
   3275 W. Ina Road, Suite 240
   Tucson, Arizona USA, 85741

2. I graduated with a Bachelors of Science degree in Geology from Western Washington University, Bellingham, Washington in 1983. I obtained a Master of Science degree in Economic Geology from The University of Arizona, Tucson in 1991.

3. I am a Founding Registered Member (1455400RM) with the Society of Mining, Metallurgy, and Exploration Geology and have been since July 2006. I have been a Certified Professional Geologist through the American Institute of Professional Geologists (CPG – 11205) since August 2008.

4. I have worked as a Geologist for a total of 25 years since my graduation with an M.S. in Geology from the University of Arizona. I am a Principal Geologist with SRK with 25 years of experience in copper and gold exploration, mine development, environmental permitting, and mine reclamation. I have professional experience at four projects in Arizona where in-situ copper recovery techniques were used or planned to be used to extract copper (Tohono, Santa Cruz, San Manuel, Florence).

5. I have read the definition of “qualified person” set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101), and past relevant work experience, I fulfill the requirements to be a “Qualified Person” for the purposes of NI 43-101.

6. I have personally visited the Project numerous times between January 14, 2010 and April 21, 2012, most recently on April 21, 2012.

7. I have had prior involvement with the property including employment for approximately 5 years with Magma Copper Company/BHP Copper, a prior owner. I visited the property on several occasions since 2001 to provide geological consulting services to the subsequent owner.

8. I am responsible for Sections 7, 8, 9, 10, 11, 12, 14, and 23 of the technical report titled *Florence Copper Project, NI 43-101F1 Technical Report, Pre-Feasibility Study,* effective date and report date of March 28, 2013 (the “Technical Report”) relating to the Florence property.

9. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, for which the omission to disclose would make the report misleading.

10. I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101.

11. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

13. As of the effective date of March 28, 2013, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 28th Day of March 2013

<Signed> *<Sealed>*

Corolla K Hoag, RM-SME, CPG

CERTIFICATE OF QUALIFIED PERSON
TERRY P. McNULTY

I, Terence P. McNulty, D. Sc., P. E., do hereby certify that:

1. I am co-owner and President of T. P. McNulty and Associates, Inc., located at 4550 North Territory Place, Tucson, AZ 85750-1885.
2. I obtained a Bachelor of Science degree in Chemical Engineering from Stanford University in 1961, a Master of Science degree in Metallurgical Engineering from Montana School of Mines in 1963, and a Doctor of Science degree in Metallurgical Engineering from Colorado School of Mines in 1966.
3. I am a Registered Professional Engineer in the State of Colorado (License # 24789) and a Registered Member (#2,152,450RM) of the Society of Mining, Metallurgy, and Exploration, Inc.
4. I have worked as a metallurgical engineer for a total of 44 years, not including years worked between degrees. My relevant experience for the purpose of the Study is as follows:
    - I am a consultant to Curis Resources (Arizona) Inc., with responsibility for assistance in direction and interpretation of metallurgical testwork performed on samples from the Florence copper resource;
    - I have been a metallurgical consultant on approximately 60 copper recovery studies and copper development projects during the last 20 years;
    - I was Manager of Corporate R&D and Technical Services for a large diversified mining firm, The Anaconda Company, which was a major copper producer.
5. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that, by reason of my education, professional registration, and past relevant work experience, I fulfill the requirements to be a “qualified person” for purposes of NI 43-101.
6. I am responsible for Section 13, Metallurgical Testing, in the “Florence Copper Project, NI 43-101F1 Technical Report, Pre-Feasibility Study”, dated March 28, 2013 for Curis Resources Ltd.
7. I have visited the property many times, beginning in 1975, and was last there on October 11, 2012.
8. As of the date of this report, to the best of my knowledge, information, and belief, section 13 of the Technical Report contains all scientific and technical information needed to support the Study’s conclusions and to avoid making the Report misleading.
9. Applying the test set out in Section 1.4 of National Instrument 43-101, I am independent of the issuers.
10. I have read NI 43-101 and Form 43-101F1 and believe that the Prefeasibility Study has been prepared in compliance with same.
11. I consent to the filing of the Pre-Feasibility Study with any stock exchange and with any other regulatory authority.

Signed and sealed on this 28th day of March, 2013, in Tucson, Arizona, USA.

Signed: *Sealed:*
Terence P. McNulty

Certificate of Qualified Person

I, Dennis L. Tucker, P.E., of Tempe, Arizona, do hereby certify that:

1. I am a Vice President of:
   ARCADIS U.S., Inc.
   400 North 44th Street, Suite 1000
   Phoenix, Arizona 85008
2. I am a graduate of Arizona State University with a Bachelor of Science degree in Civil Engineering (1986).
3. I am a licensed professional Civil Engineer in good standing in the state of Arizona, USA.
4. I am a Board Certified Environmental Engineer of the American Academy of Environmental Engineers and in good standing with the Academy.
5. I am a member in good standing of the Society for Mining, Metallurgy & Exploration.
6. I have practiced my profession continuously for 26 years since graduation, the last 12 of which have been focused on water treatment issues in the mining industry.
7. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101, or the Instrument) and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
8. I am responsible for preparation of Sections 1.20.3 and 20.2 of the report entitled: *Florence Copper Project, NI 43-101F1 Technical Report, Pre-Feasibility Study*, dated March 28, 2013 (the "Technical Report").
9. I am independent of Curis Resources (Arizona) and have not had any prior direct involvement with the property that is the subject of the technical report.
10. I have read the Instrument and the technical report has been prepared in compliance with the Instrument.
11. The date of my most recent site visit was December 16, 2011.
12. At the effective date of the technical report, to the best of the qualified person's knowledge, information, and belief, the technical report, or part that the qualified person is responsible for, contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Signed and dated this 28th day of March, 2013 at Phoenix, Arizona.

Signed and Sealed

____

Dennis L. Tucker, P.E.
Vice President
ARCADIS U.S., Inc.

Knight Piésold
CONSULTING

Knight Piésold and Co.

1999 Broadway, Suite 600
Denver, Colorado 80202-5706 USA
Telephone: (303) 629-8788
Facsimile: (303) 629-8789
E-mail: *denver@knightpiesold.com*

March 28, 2013

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

KP Project No.: TU101.00448/06
KP Doc. No.: TU-13-0008

Attn: Glen Hoffmeyer

Subject: Florence Copper Project, Pre-Feasibility Study
Qualified Person Certificate

I, Richard Frechette, P.E. residing at Denver, Colorado, do hereby certify that:

1. I am a Senior Vice President of Environmental Services of Knight Piésold and Co. located at 1999 Broadway, Suite 600 Denver, Colorado 80202-5706.
2. I am a graduate of University of Arizona with a Bachelor of Science degree in Geological Engineering (Geotechnics Option), 1983.
3. I am a licensed professional engineer in good standing in the States of Arizona, Nevada, Washington, Alaska, and New York, USA.
4. I am a member in good standing of the Society for Mining, Metallurgy, and Exploration.
5. I have practiced my profession continuously for 29 years since my graduation from university.
6. I have read the definition of “qualified person” set out in National Instrument 43-101 (NI 43-101, the instrument), and certify that by reason of my education, professional engineering license, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.
7. I have personally visited the project area on September 14, 2011.
8. I am responsible for preparation of the water impoundment design in Section 20.2 of the technical report titled “Florence Copper Project, NI 43-101F1 Technical Report, Pre-Feasibility Study” dated March 28, 2013 (the "Technical Report").
9. I have co-authored parts of Section 20b (Water Impoundments).
10. As a qualified person, I am independent of the issuer as defined in Section 1.5 of National Instrument 43-101.
11. I have read the instrument and the portions of the technical report prepared by me have been prepared in compliance with the instrument.
12. As of the date of the technical report, to the best of my knowledge, information and belief, the portions of the Technical Report authored by myself contain all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Sincerely,
Knight Piésold and Co.

[Signed and Sealed]

Richard J. Frechette, P.E.
Senior Vice President of Environmental Services

APPENDIX B: CLOSURE AND POST-CLOSURE COST ESTIMATE FOOTNOTES

2010 Closure and Post-Closure Cost Estimates Footnotes

Footnote	Unit Cost Description
1	Clean and remove pipes - crew hour assumes (1 equipment operator $49.73/hr, 1 laborer $43.10/hr, 1 water pump $96.50/day) source is 2004 RS Means, CPI inflation adjustment 2004 to 2010 is $1.16, crew hour includes contractor overhead and profit. Assumes crew can clean and remove 100 LF per hour. 24" HDPE = 65.24lb/lf.
2	Disposal of non-hazardous waste - includes loading, transport, and disposal; unit cost source is 2010 contractor bid for similar project.
3	Sampling and Analysis (S&A): Initial S&A will be performed to characterize soil potentially affected by spills and leaks. Follow-up S&A may be required in order to determine the extent of contamination or effectiveness of remediation efforts. The 2010 estimated S&A cost of $300 per sample is based on the following: sampling cost of $123 (2001 estimate of $100 adjusted by CPI factor of 0.23); analytical cost of $163.10 for Complete Soil Analysis (CSA) as reflected in recent quote; and rounding the total cost of $286 to $300. Unit costs based on previous similar project costs.
4	Liner Removal - unit cost per contractor estimate 2010.
5	4. Evaporate impoundment contents using facility evaporators.[11]
6	Well abandonment unit costs derived from contractor bids received in May 2010.
7	Toxicity Characteristic Leaching Procedure (TCLP) tests for the Resource Conservation and Recovery Act (RCRA) "Eight Metals" (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) may be required for contaminated material shipped to off-site disposal facilities. Based on the above, current sampling cost is estimated to be $123 and recent quote for analysis is $84 per sample for a combined cost estimate of $207, rounded to $210.
8	Demo concrete - Unit cost source is Racer cost estimate software.
9	Sample and analyze concrete - sample unit costs assume not to exceed $200 per sample, analytical cost assume $150 for sample preparation, $210 for TCLP and CSA, and $40 for misc costs.
10	Well rinsing unit costs assume 290 injection wells and 307 recovery wells, 3 pore volumes, 8% porosity; 2,550,761,260 gallons. Pumps will use 10 hp motor, $0.08/kwh, $5,256/year/pump. Assumes 597 pumps for 2 year period. Assumed on-site water source is provided.
11	Evaporation Unit Costs - Landshark Evaporators manufacturer information, 2,250 gallons/hr evaporation rate, $2.39/hr electrical cost; $1.06/1,000 gallons. Purchase of evaporator not included.
12	Level 1 sampling & analysis unit costs include sampling, lab analysis, and reporting. Costs based on recent similar projects. Lab analysis costs are $57 per sample.
13	Level 2 sampling & analysis unit costs include sampling, lab analysis, and reporting. Costs based on recent similar projects. Lab analysis costs are $884 per sample.
14	Fold water impoundment liner - crew hour assumes (1 equipment operator $49.73/hr, 5 laborer $43.10/hr, 1 backhoe loader $228.6/day) source is 2004 RS Means, CPI inflation adjustment 2004 to 2010 is $1.16, crew hour includes contractor overhead and profit. Assumes crew can fold liner in 23 days, $2,726.5/day. Assumes crew can pull back liner to cover sediment at 600 lf/day.
15	Triple rinse tanks - crew hour assumes (1 equipment operator $49.73/hr, 1 laborer $43.10/hr, 1 water pump $96.50/day) source is 2004 RS Means, CPI inflation adjustment 2004 to 2010 is $1.16, crew hour includes contractor overhead and profit. Assumes crew can triple rinse tanks in 6 days.
16	Quicklime Neutralization assumes 0.1 pounds of lime per gallon of water to be neutralized, $135/ton or $0.06/lb lime unit cost. Source is Preliminary Economic Assessment (PEA) by SRK Consulting, 9/30/2010.
17	Administrative support and expenses includes utilities and communications cost, miscellaneous equipment and site maintenance, and site management during closure.
18	Demo/removal of chain link fencing - Unit cost source is Racer cost estimate software version 8.1.2.
19	Operation and maintenance labor crew assumes 3 day laborers $43.10/hr, 8 hours per day and 1 night laborer $43.10/hr, 16 hours a day; $2,000/day for 2 years. Unit cost source is 2004 RS Means, CPI inflation adjustment to 2010 is 1.16.
Note:	*In preparing this estimate, Brown and Caldwell has relied on information and direction provided by Curis Resources and other parties and, unless otherwise expressly indicated, Brown and Caldwell has made no independent investigation as to the validity, completeness, or accuracy of such information. As with any estimate of this nature, Brown and Caldwell recommends that critical assumptions as well as the basis of estimate, be verified before proceeding with detailed project design or implementation.*
	Estimated quantities for existing facilities are based on field observations and take-offs from aerial

	photography.
	Estimated quantities for proposed facilities are based on draft design plans by Knight Piesold Consulting prepared December 2010.
	Source for existing well data is Arizona Department of Water Resources (ADWR).