

STATE OF ARIZONA
AREA-WIDE AQUIFER PROTECTION PERMIT NO. P-101703
PLACE ID # 7820, LTF # 54902
Other Amendment

1.0 AUTHORIZATION

In compliance with the provisions of Arizona Revised Statutes (A.R.S.) Title 49, Chapter 2, Articles 1, 2 and 3, Arizona Administrative Code (A.A.C.) Title 18, Chapter 9, Articles 1 and 2, A. A. C. Title 18, Chapter 11, Article 4 and amendments thereto, and the conditions set forth in this permit, Resolution Copper Mining, LLC (RCML) is hereby authorized to close the facilities within this permit at the Superior Mine, West Plant Site, located in the Town of Superior, Arizona, over groundwater of the Phoenix Active Management Area, East Salt River Valley Sub-basin in Township 1 South, Range 12 East, Sections 34 and 35 and Township 2 South, Range 12 East, Sections 2 and 4 of the Gila and Salt River Base Line and Meridian.


This permit becomes effective on the date of the Water Quality Division Director's signature and shall be valid for the life of the facility (operational, closure, and post-closure periods), unless suspended or revoked pursuant to A.A.C. R18-9-A213. The permittee shall construct, operate and maintain the permitted facilities:

1. Following all the conditions of this permit including the design and operational information documented or referenced below; and
2. Such that Aquifer Water Quality Standards (AWQS) are not violated at the applicable point(s) of compliance (POC) set forth below, or if an AWQS for a pollutant has been exceeded in an aquifer at the time of permit issuance, that no additional degradation of the aquifer relative to that pollutant, and as determined at the applicable POC, occurs as a result of the discharge from the facility.

1.1 Permittee Information

Facility Name:	Superior Mine, West Plant Site	
Permittee:	Mailing Address:	Facility Street Address:
Resolution Copper Mining, LLC	102 Magma Heights P.O. Box 1944 Superior, Arizona 85173	102 Magma Heights P.O. Box 1944 Superior, Arizona 85173
Facility Contact:	Mr. Jonathan Cherry, Vice-President	(520) 689-9374
Emergency Telephone Number:	(520) 827-0585	
Latitude: 33°18'21"North		Longitude: 111°05'84"West
Legal Description: Township 1 South, Range 12 East, Sections 34 and 35, and in Township 2 South, Range 12 East, Sections 2 and 4 of the Gila and Salt River Base Line and Meridian		

1.2 Authorizing Signature



Michael A. Fulton, Director
Water Quality Division
Arizona Department of Environmental Quality
Signed this 29th day of March, 2012

This amended permit supersedes all previous permits.

2.0 SPECIFIC CONDITIONS [A.R.S. §§ 49-203(4), 49-241(A)]

2.1 Facility/Site Description [A.R.S. § 49-243(K)(8)]

The West Plant Site of the Superior Mine, is located north-northwest of the Town of Superior, and includes all mine facilities and associated infrastructure formerly operated by BHP Billiton (BHP). The property was formerly owned by Magma Copper Company Superior Division, which was purchased by BHP in 1995. The property was then transferred by BHP to the permittee, RCML in May 2004.

Mining of the Magma Vein, a quartz-sulfide ore body, occurred from the late 1800s through the 1940s at the West Plant Site and was followed by the discovery and mining of a carbonate replacement ore body to the east. Underground mining activities conducted from the late 1800s through mid-1996 produced approximately 26 million tons of ore at the time, out of which approximately 20 million tons were tailings. About 6 to 7 million tons of the tailings were returned to the underground workings as structural support and the remainder sent to the tailings facilities at the West Plant Site. Approximately 200 acres of tailings generated from former milling operations are located at the West Plant Site.

Many of the facilities associated with the mine site ceased operation, or were closed, prior to January 1, 1986 and are therefore exempt from regulation under the Aquifer Protection Permit (APP) program. The facilities listed in the table below are regulated by this permit.

This area-wide permit is for closure of existing APP-regulated facilities under a compliance schedule in Section 3.0. Final closure configuration is expected to be achieved in the first quarter of 2020. The closure dates are based in part on the need to coordinate the closure activities of APP-regulated facilities with RCML's closure activities of up-gradient non APP-regulated facilities, and in part to coordinate the closure activities of APP-regulated facilities with RCML's smelter-affected soils efforts under the Voluntary Remediation Program. Closure shall be achieved through two approaches: (i) removal/clean closure; and (ii) closure in place. Closure shall be performed consistent with the Best Available Demonstrated Control Technology (BADCT) requirements identified in Section 2.2.1. RCML may later amend this APP to add new mine development activities or may pursue a separate permit for new mine development activities.

Because only a portion of facilities are proposed for removal/clean closure, the permittee shall perform post-closure care, maintenance and groundwater monitoring for a post-closure period. The post-closure period shall be assessed using numerous lines of evidence, including, but not limited to: geochemical properties of the material within the facilities, underlying vadose zone, and hydrogeology of the West Plant Site.

The permittee shall perform assessments of the groundwater monitoring program and post-closure period every five (5) years after permit issuance in accordance with the Compliance Schedule at Section 3.0.

The West Plant Site includes the following permitted discharging facilities:

APP Discharging Facilities	Latitude (North)	Longitude (West)
Mill Sands Pond	33°18'2"	111°6'1"
Depot Pond	33°17'25"	111°6'39"
Unlined Ditch to Depot Pond included with Depot Pond		
Indian Ponds	33°17'17"	111°6'52"
Unlined Wastewater Ditch to West Indian Pond included with Indian Ponds		
Seepage Control to West Indian Pond included with Indian Ponds		
Unlined Wastewater Ditch to East Indian Pond included with Indian Ponds		
Seepage Control to East Indian Pond included with Indian Ponds		
Stormwater Pond on Tailings Pond 6	33°18'7"	111°6'40"
Tailings Pond 5	33°18'7"	111°6'23"

APP Discharging Facilities	Latitude (North)	Longitude (West)
Tailings Ponds 6 and 7	33°18'7"	111°6'40"
Seepage Control No. 6 Pond included with Tailings Pond 6		
Settling Pond 1	33°18'4"	111°6'14"
Settling Pond 2	33°18'4"	111°6'14"
French Drain to Settling Pond 2 included with Settling Pond 2		
Smelter Pond	33°17'37"	111°6'24"
Seepage Control for Smelter Pond included with Smelter Pond		
French Drain at City Hall included with Smelter Pond		
500 Yard Waste Rock Facility	33°18'6"	111°5'50"
Outfall 001	33°17'15"	111°6'54"
WWTP and East Plant Site	33°18'17"	111°03'59"

Annual Registration Fee [A.R.S. § 49-242]

The Annual Registration Fee for this permit is established by A.R.S. § 49-242 and is payable to the Arizona Department of Environmental Quality (ADEQ) each year. The design flow to Outfall 001 is 0 to 200 gallons per minute for a total of 288,000 gallons per day.

Financial Capability [A.R.S. §§ 49-243(N) and A.A.C. R18-9-A203]

The permittee has demonstrated the financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203. The permittee shall maintain financial capability throughout the life of the facility. The estimated closure cost is \$12,069,000 and the post-closure cost is \$194,000 per year. The financial capability was demonstrated through an irrevocable letter of credit for \$13,497,000 issued by ScotiaBank, as per A.A.C. R18-9-A203.C.5.

2.2 Best Available Demonstrated Control Technology [A.R.S. § 49-243(B) and A.A.C. R18-9-A202(A)(5)]

The West Plant Site APP-regulated facilities shall be removed/clean closed or closed in-place. Materials taken from the removal/clean closure shall be consolidated and used as mass-grading fill in approved facilities in accordance with the Compliance Schedule of this permit, Sections 3.0 and 3.1. Until closure configuration is achieved, all APP-regulated facilities shall be operated and maintained to prevent unauthorized discharges.

Closure configuration shall ensure that the APP-regulated facilities are designed, constructed, operated and maintained to meet the closure requirements specified in A.A.C. R18-9-A202(A)(5)(a through d), A.A.C. R18-9-A209(B)(3), and A.R.S. § 49-243(B) as applicable for closure of mining facilities and minimize infiltration into the subsurface in a manner that could cause or contribute to a violation of an aquifer quality limit (AQL) at a designated POC.

Where necessary and practicable, closure activities at the regulated facilities shall be sequenced in an effort to minimize the potential of the closed facilities to be impacted by runoff or other conditions from hydraulically upgradient facilities or areas that have yet to be closed or otherwise addressed including, but not limited to, non- APP regulated facilities.

The permittee is authorized to close the facilities listed in Section 2.1, subject to the applicable conditions of this permit.

2.2.1 Engineering Design

Conceptual designs, final designs, work plans and/or closure reports shall be submitted in accordance with the Compliance Schedule in Sections 3.0 and 3.1 of this permit. Suitable

structural fill materials are defined in Section 2.2.1.15. Suitable mass grading materials are defined in Section 2.2.1.16. Suitable cover material is defined in Section 2.2.1.17. Suitable armor rock (riprap) is defined in Section 2.2.1.18. The permittee may make minor modifications to design components and materials specified below during final design, subject to the Groundwater Section approval of the final design, and provided that the modifications do not materially affect BADCT performance with respect to infiltration, erosion, stability, revegetation, and runoff control or substantially alter the designs that were the basis of this APP. Modifications during final design that materially affect BADCT performance or substantially alter the designs that were the basis of this APP shall require permit amendment and if implemented without ADEQ pre-approval and permit amendment may be considered a permit violation.

2.2.1.1 Mill Sands Pond

A. Background

The footprint of the former Mill Sands Pond is no longer visible except through comparison of aerial photographs. The pond was reworked and materials from the pond were removed in 2005. The permittee submitted a removal/clean closure workplan to ADEQ in May 2007 and removed additional materials from the pond in 2008 pursuant to the workplan.

B. Closure Requirements

Clean closure of this facility was accepted in May 2011 and the clean closure permit was issued on September 9, 2011. There are no further permit requirements for this facility. (See Compliance Schedule 3.2, Items 40 and 41 for a summary of completed requirements.)

2.2.1.2 Depot Pond

A. Background

The Depot Pond historically accepted overflow through an unlined ditch from the Smelter Pond and overflowed through an open channel to the East Indian Pond. The permittee removed materials from the pond and ditch in 2008 pursuant to an approved removal/clean closure workplan under the APP.

B. Closure Requirements

Clean closure of this facility was accepted in March 2011 and the clean closure permit was issued in July 2011. The permittee shall maintain revegetation on the post-removal surface to stabilize the surface until the area is redeveloped. (See Compliance Schedule in Section 3.2, Items 42, 43 and 44 for a summary of completed requirements.)

2.2.1.3 East and West Indian Ponds

A. Background

East Indian Pond – Prior to closure configuration, the East Indian Pond has an impoundment surface area of 2.7 acres and retains overflow from the Depot Pond. Overflow from the East Indian Pond flows to the West Indian Pond via a notch in the dike. A seepage control structure located downgradient of the East Indian Pond facilitates pump back of seepage from East Indian Pond.

West Indian Pond – Prior to closure configuration, the West Indian Pond has an impoundment surface area of 2.9 acres. The West Indian Pond retains overflow from the East Indian Pond. Overflow from the West Indian Pond can pass over a flow measurement weir to the Outfall 001. A seepage control structure located downgradient of the West Indian Pond facilitates pump back of seepage from the West Indian Pond.

B. Closure Requirements

The permittee shall implement the removal/clean closure workplan, which was approved in May 2011, for the Indian Ponds. The following facilities associated with the ponds shall be closed with the ponds in accordance with the Compliance Schedule of this permit: unlined wastewater ditch to the West Indian Pond, seepage control to the West Indian Pond, unlined wastewater ditch to the East Indian Pond, and seepage control to the East Indian Pond. The closure activities shall be sequenced in an effort to minimize the potential of the clean closed ponds to be impacted by runoff or other conditions from hydraulically up-gradient facilities or areas that have yet to be closed or otherwise addressed.

In accordance with the workplan: (i) the removed materials shall be deposited at another facility regulated under this APP, prior to the completion of the final closure configuration of the other facility; (ii) the post-removal surface shall not contain regulated pollutants at concentrations exceeding minimum, alternative or site-specific GPLs; and (iii) the post-removal surface shall be revegetated to stabilize the surface until new non-contact stormwater ponds are constructed.

After clean closure, the ponds shall receive only non-contact stormwater which is exempt from APP regulation and discharge to Queen Creek Wash through Outfall 001.

A final closure report and clean closure application shall be submitted in accordance with the Compliance Schedule in Section 3.1, Item 22, formerly CSI 47.

2.2.1.4 Stormwater Pond on Tailings Pond 6

A. Background

Tailings Pond 6 has a surface area of approximately 50 acres. Storm water from the Indian Ponds is currently pumped to Tailings Pond 6 for disposal.

B. Closure Requirements

The permittee shall submit a workplan for the removal/clean closure of the stormwater pond in accordance with the Compliance Schedule in Section 3.0, Item 48. The workplan shall incorporate pre-removal sampling results and include the closure activities specified below.

The stormwater shall be evaporated and/or removed. Removed stormwater may be transferred to the permittee's on-site mine water treatment plant provided regulations applicable to such treatment are satisfied. After removal of the stormwater, no additional stormwater (other than precipitation that falls directly on the surface of Tailings Ponds 6 and 7 or precipitation within the watershed

that reports to Tailings Ponds 6 and 7) shall be placed on Tailings Ponds 6 and 7. A final closure report and clean closure application shall be submitted in accordance with the Compliance Schedule, Section 3.1, Item 23, formerly CSI 49.

(Closure of Tailings Ponds 6 and 7 shall take place subsequent to the evaporation and/or removal of the stormwater in the ponds, in accordance with Section 2.2.1.6.)

2.2.1.5 Tailings Pond 5 (Excluding West Outslope)

A. Background

Tailings Pond 5 no longer receives tailings and is inactive. The pond's west outslope continues to receive mine materials removed from other facilities at the West Plant Site for later use as mass grading fill on Tailings Ponds 6 and 7.

B. Closure Requirements

The permittee performed in-place closure of the pond in 2008 in accordance with an ADEQ-approved closure design under the APP. The post-closure construction of Tailings Pond 5 shall be maintained as follows:

- The pond is mass graded with mass grading fill at a 1% minimum slope from an elevation of 3,051 feet at the north end to an elevation of 3,025 feet at the southeast end.
- The embankment of the pond is graded to a slope of 4H: 1V, by local cut to fill.
- A surface water channel is constructed in the regraded surface of the West Arm of the pond. The channel shall conduct run-on flow from an upstream watershed and runoff flow to a confluence with a channel from the East Arm. The channel has a trapezoidal section, bottom width of 10 feet, depth of 2 feet, and a riprap thickness of 6 inches. The channel is lined with low permeability fill and 12 ounces/square yard nonwoven geotextile.
- A surface water channel is constructed in the regraded surface of the East Arm of the pond. The channel shall conduct run-on flow from an upstream watershed and runoff flow to a confluence with the channel from the West Arm. The channel has a trapezoidal section, bottom width of 10 feet, depth of 2 feet, and a riprap thickness of 6 inches. The channel is lined with low permeability fill and 12 ounces/square yard nonwoven geotextile.
- A surface water channel is constructed along the regraded surface of the southern portion of the pond and riprapped to provide erosion protection. The channel shall conduct flow from the confluence of the two upstream channels to the southwest end of the facility. The channel has a trapezoidal section, bottom width of 10 feet, depth of 4.5 feet, and a riprap thickness of 6 inches. The channel is lined with low permeability fill and 12 ounces/square yard nonwoven geotextile.
- A 3-foot thick moisture store and release cover is installed to an elevation of 3 feet above the fill material, tailings and embankment of the pond.

- The cover material on the pond is revegetated with a desert vegetation seed mix per the revegetation design for the pond provided in the APP application.

The closure completion report submitted by the permittee was approved in February 2011. (See Compliance Schedule in Section 3.2, Items 17, 18 and 19 for a summary of completed requirements.)

C. Post-Closure Requirements

The Permittee initiated post-closure BADCT performance standard inspection and monitoring of the facility in accordance with Table 4.2-15 in September 2008. The permittee shall continue BADCT performance standard inspection and monitoring in accordance with the requirements listed in Section 2.5.2 and Table 4.2-15.

2.2.1.6 Tailings Ponds 6 and 7 and West Outslope of Tailings Pond 5

A. Background

Tailings Ponds 6 and 7 no longer receive tailings and are inactive. Tailings Pond 7 is located directly upgradient of Tailings Pond 6.

The permittee submitted a workplan under the APP to characterize the materials taken from other facilities and staged on the west outslope of Tailings Pond 5 to determine their suitability for possible use as mass grading fill at Tailings Ponds 6 and 7. ADEQ approved the workplan on December 23, 2008. (See Compliance Schedule in Section 3.2, Item 35 for a summary of completed requirements.)

B. Closure Requirements

The permittee implemented the approved West Outslope of Tailings Pond 5 materials characterization workplan and submitted a report of findings in October 2010 in accordance with the Compliance Schedule in Section 3.2, Item 36. The characterization report was approved by ADEQ in May 2011. (See Compliance Schedule in Section 3.2, Item 36, for a summary of completed requirements).

The permittee shall submit a final design for the in-place closure of Tailings Ponds 6 and 7 in accordance with the Compliance Schedule in Section 3.0, Item 13, formerly CSI 37. The final design shall: (a) incorporate the findings of the materials characterization, as to the suitability of the materials for use as mass grading fill in the closure of Tailings Ponds 6 and 7; (b) include the closure of the west outslope of Tailings Pond 5 following the use of the fill staged on the outslope; (c) be consistent with the approved remedial action workplan for smelter-affected soils designated for use as mass grading fill (see Section 2.2.1.13); (d) include the closure of the seepage control for Tailings Pond 6; and (e) include the closure activities specified below.

Tailings Pond 6 West Arm – The west arm of Tailings Pond 6 shall be mass graded using mass grading fill at a minimum 1% slope from an elevation of 2,984 feet at the north end to an elevation of 2,966 feet at the south end. A

surface water channel shall be constructed in the regraded surface. The channel shall conduct flow to a spillway at the northern abutment of the tailings embankment. The channel shall have a trapezoidal section, bottom width of 20 feet, depth of 6 feet, and a riprap thickness of 18 inches. The channel shall be lined with low permeability fill and 12 ounces/square yard nonwoven geotextile. The spillway shall be designed for the $\frac{1}{2}$ probable maximum flood, bedded on natural ground, and lined with gabions.

Tailings Pond 6 East Arm and Tailings Pond 7 – The east arm of Tailings Pond 6 and Tailings Pond 7 shall be mass graded using mass grading fill at a 1% minimum slope from an elevation of 2,980 feet at the north end to an elevation of 2,971 feet at the south end. A surface water channel shall be constructed in the regraded surface to conduct flow to a confluence with the channel from Tailings Pond 5, thence to a spillway in the south abutment of Tailings Pond 6. The channel on Tailings Pond 7 shall have a trapezoidal section, bottom width of 30 feet, depth of 6 feet, and a riprap thickness of 18 inches. The channel on the East Arm of Tailings Pond 6 shall have a bottom width of 40 feet, a depth of 7 feet, and a riprap thickness of 24 inches. Both channels shall be lined with low permeability fill and 12 ounces/square yard nonwoven geotextile. The spillway shall be designed for the $\frac{1}{2}$ probable maximum flood, bedded on natural ground, and lined with gabions.

Embankment Channel – A surface water channel shall be constructed down the re-graded west outslope of Tailings Pond 5 to conduct flow from the upstream channel at the southern portion of Tailings Pond 5 to the confluence with surface water channels in Tailings Pond 6. The channel shall have a rectangular section, bottom width of 24 feet, depth of 7 feet, and stepped gabions.

Cover - A 3-foot thick moisture store and release cover be installed to an elevation of 3 feet above the fill material and tailings on the top surface of Tailings Ponds 6 and 7.

Revegetation – Cover material for Tailings Pond 6 and 7 shall be revegetated with a desert vegetation seed mix per the revegetation design for Tailings Ponds 6 and 7 provided in the APP application.

(The embankment of Tailings Pond 6 is an engineered structure not comprised of tailings; therefore, regrading and revegetation are not planned nor required for the embankment.)

The permittee shall submit a final closure report in accordance with the Compliance Schedule in Section 3.1, Item 21, formerly CSI 38.

C. Post-Closure Requirements

Upon ADEQ approval of the final closure report, the permittee shall initiate post-closure BADCT performance standard inspection and monitoring in accordance with the requirements listed in Section 2.5.2 and Table 4.2-15.

2.2.1.7 Settling Pond 1

A. Background

Settling Pond 1 has an impoundment surface area of 4.1 acres, with a maximum holding capacity of 30 acre-feet of water. The Pond formerly received overflow from Settling Pond 2 and Tailings Pond 6. This water was then recycled for use in the mining operations or routed to the Smelter Pond for further treatment. Settling Pond 1 is no longer used for storing water and was partially filled in November 2006 with tailings excavated from the footprint of an adjacent sludge storage impoundment.

B. Closure Requirements

The final closure design of Settling Pond 1 was approved by ADEQ in May 2011. The groundwater and stability demonstrations were previously approved by ADEQ in January 2010. (See Compliance Schedule in Section 3.2, Items 24 and 25 for summary of completed requirements.) The permittee shall implement the approved design to close Settling Pond 1. The design's implementation shall include the elements described below.

Grading – Settling Pond 1 shall be graded using mass grading fill to be domed from the approximate center with 2% slopes downhill to the northwest, west, and southwest. Overall, the surface shall be sloped from an elevation of 2,983 feet in the approximate center to 2,977 feet in the northwest corner. The access way to the southeast shall be sloped from an elevation of 2,984 feet to 2,976 feet.

Surface Water Channels – There shall be five surface water channels. Channel 1 shall extend along the east and north perimeter to convey flow to the northwest corner. Channel 1 shall be triangular in cross section with a depth of 3.5 feet and side slopes of 2.5H:1V. Channel 2 shall extend along the west perimeter to convey flow to the northwest corner. Channel 2 shall be triangular in cross section with a depth of 2.5 feet and side slopes of 2.5H:1V. Channel 3 shall extend along the east perimeter to convey flow to the southeast corner. Channel 3-1 shall be triangular in cross section with a depth of 2.5 feet and side slopes of 2.5H:1V. Channel 3-2, an extension of Channel 3-1, shall be triangular in cross section with a depth of 2 feet and side slopes of 2.5H:1V. Channels 1, 2, and 3 shall be constructed with a 1-foot thick low permeability layer, overlain by 12-ounce/square yard non-woven geotextile, and overlain by a 0.5-foot to 1.5-foot thick layer of riprap, depending on the channel. From the northwest corner, Channel 4 shall extend along the northern perimeter of the North Sludge Storage Impoundment to the existing culvert at the southwest corner of the North Sludge Storage Impoundment. Channel 4 will be excavated into Gila Conglomerate with bottom width of 5 feet, a depth of 6 feet, and side slopes of approximately 1H:1V.

Cover – A 3-foot thick moisture store and release cover shall be installed to an elevation of 3 feet above the mass grading fill.

Revegetation – Cover material shall be revegetated with a desert vegetation seed mix.

The permittee shall submit a final closure report in accordance with the Compliance Schedule in Section 3.0, Item 26. The timing of the closure and therefore the closure report may be dependent on the availability of smelter-affected soils for use as mass grading fill; and the need to sequence the closure properly in order to minimize the potential of the closed pond to be impacted by runoff or other conditions from hydraulically upgradient facilities or areas that have yet to be closed or otherwise addressed including, but not limited to, facilities exempt from regulation under the APP program and which the permittee is addressing on a voluntary basis.

C. Post-Closure Requirements

Upon ADEQ approval of the final closure report, the permittee shall initiate post-closure BADCT performance standard inspection and monitoring in accordance with the requirements listed in Section 2.5.2 and Table 4.2-15.

D. Additional Sampling Requirements

Organic constituents were detected during sampling of pore water collected below the delta deposits in the pond. Due to the detection of the organic constituents, the permittee shall collect groundwater samples from the alert well installed downgradient of the pond in accordance with this permit and analyze the samples for organic constituents. The Compliance Schedule in Section 3.2 required submittal of a workplan for assessing this area if, during ambient groundwater monitoring, organic constituents were detected in the alert well above an established numeric AWQS. Organic constituents were not detected in the alert well during ambient groundwater monitoring. A workplan to assess this area is not required and the Compliance Schedule Item in Section 3.2 Item 11 has been completed. If organic constituents are detected during compliance groundwater monitoring at concentrations above the AL specified in Table 4.2-11, then the permittee shall comply with Section 2.6.2.3.4.

2.2.1.8 Settling Pond 2

A. Background

Settling Pond 2 had a surface area of 5.3 acres, with a maximum holding capacity of 47 acre-feet of water. Settling Pond 2 was the first retention treatment pond in the mine water treatment circuit and retained overflow water from water treatment from the former thickening tanks. Overflow water from Settling Pond 2 was distributed to Settling Pond 1, where it was recycled for use in the mining operations or routed to the Smelter Pond for further treatment. A seepage control French drain reportedly is situated downgradient of Settling Pond 2, although the permittee has so far been unable to locate the drain.

B. Closure Requirements

The permittee in 2007 constructed two new impoundments, the North and South Sludge Storage Impoundments (SSIs), above former Settling Pond 2 pursuant to the 3.02 General APP to receive water treatment residuals from mine dewatering. The SSI's ground surface is covered with structural fill to a depth of 2 feet. The SSI's base has a slope of 1.5%, from an elevation of 2,974 feet to an elevation of 2,970 feet. The SSI's embankment is composed of structural fill

with a crest elevation of 2,979 feet and 2.5H: 1V side slopes. Consistent with the terms of the corresponding Discharge Authorization (#105727), the SSI's liner system consists of a clay liner and an HDPE liner, which forms an impermeable barrier over the existing ground surface. A runoff diversion ditch is constructed around the northwest and southwest sides of the SSI to convey run-on around the facility. The SSI has an emergency spillway at the southwest corner. The emergency spillway is designed for ½ peak maximum flow and discharges to a stormwater system that conveys water to Outfall 001.

The final closure report of the above activities was approved by ADEQ on November 4, 2010. (See Compliance Schedule in Section 3.2, Item 20 for a summary of completed requirements.)

Post-closure BADCT performance standard inspection and monitoring is not required at this time for Settling Pond 2, as the North and South SSIs will be operated, inspected, and maintained in accordance with the general permit. The permittee conducted an investigation to locate the French drain. If the permittee is able to locate the French Drain in the future, the permittee shall close the drain.

2.2.1.9 Smelter Pond

A. Background

The Smelter Pond impoundment had a surface area of 5.7 acres with a maximum holding capacity of 32 acre-feet of water. The primary purpose of the Smelter Pond was to capture stormwater/seepage water for reuse and/or treatment and discharge. Water retained in the Smelter Pond was classified as process water. Overflow from the Smelter Pond was either pumped to Tailings Pond 6 for eventual reuse or fed into an open channel to the Depot Pond. The Smelter Pond also retained overflow from Settling Pond 2. A seepage control system located downgradient of the Smelter Pond was comprised of a French drain and two caissons. Seepage from the Smelter Pond was collected in the French drain, flowed into one of the caissons, was gravity-fed to the other caisson, and then was pumped back to either the Smelter Pond or the open channel leading to the Depot Pond.

B. Closure Requirements

The permittee closed the Smelter Pond in place in 2008. The post-closure construction of the Smelter Pond shall be maintained as follows:

- The pond is mass graded with a mass grading fill at an approximately 4% maximum slope from an elevation of 2,800 feet at the southeast crest to an elevation of 2,775 feet at the northwest end.
- The embankment of the pond is graded to approximately 3H:1V, by local cut to fill.
- A temporary geomembrane-lined channel extends between the northeast and northwest corners of the pond, along the northern perimeter of the pond. The channel slopes at approximately 0.5 percent in the downstream direction. The channel has an 8-foot bottom width, a

4.5-foot depth, and 3H:1V side slopes. The geomembrane has a thickness of 60 mils.

- The French drain and sumps have been removed and are backfilled with mass grading fill used for clean closed facilities (Section 2.2.1.16).
- A 3-foot thick moisture store and release cover is installed to an elevation of 3 feet above the fill material on the top surface and embankment of the pond.
- The cover material on the pond is revegetated with a desert vegetation seed mix per the revegetation design for the pond provided in the APP application.

The completion report of the above closure was submitted by the permittee in November 2008 and approved by ADEQ in February 2011. (See Compliance Schedule in Section 3.2, Items 28 and 29 for summary of completed requirements.)

C. Post-Closure Requirements

The permittee initiated post-closure BADCT performance standard inspection and monitoring of the facility in accordance with Table 4.2-15

The permittee shall replace the temporary geomembrane-lined channel with a permanent channel at the time of closure of the adjacent Tailings Pond 3 and 4 (which are exempt from APP regulation) and submit an as-built of the permanent channel.

The permittee shall continue BADCT performance standard inspection and monitoring in accordance with the requirements listed in Section 2.5.2 and Table 4.2-15.

2.2.1.10 500 Yard Waste Rock Facility

A. Background

The 500 Yard Waste Rock Facility (500 Yard facility) contains approximately 2 million tons of waste rock material. Based on the November 1997 Mine Material Characterization Report, the 500 Yard facility is comprised of dacite, diorite, and limestone with varying degrees of alteration (pyritic) and weathering from the No. 5 Shaft, the access tunnel to the No. 3 Shaft and the Never Sweat Tunnel.

B. Closure Requirements

The permittee performed in-place closure of the facility in 2007. The post-closure construction of the facility shall be maintained as follows:

The top surface of the facility was covered with a 1 foot thick layer of compacted structural fill. The final grade was constructed with a minimum slope of 0.5% toward the surface water channels. The outslope was flattened with local cut-to-fill and imported mass grading fill to a slope of 2.5H: 1V. A minimum 3-foot thick store and release cover was installed on the outslopes.

Surface Water Channels - Surface water channels were constructed along the northern side of the West Lobe 500 Yard. Surface water channels were constructed along the eastern side of the East Lobe 500 Yard, and along the western and southern sides of the lower bench of the East Lobe 500 Yard. The channels conduct flow to junction structures. Junction structures discharge into culverts conveying flow under the 500 Yard, around the out slopes, and discharging to the non-contact stormwater conveyance system. The channels have a triangular section, top width of 7.5 feet to 16 feet, side slopes of 2.5H:1V minimum to 2H:1V maximum, depths of 1.5 feet minimum to 4 feet maximum, and a riprap thickness of 12 inches minimum to 24 inches maximum. The channels are lined with low permeability fill, 12 ounces/square yard nonwoven geotextile and covered with 12 to 24 inches of rip-rap for erosion protection.

Cover material on the out slopes was revegetated with a desert vegetation seed mix per the revegetation design provided in the APP application. The top surface of the 500 Yard was not revegetated and will be used for parking, storage and other activities.

The permittee submitted a report of the above closure in August 2007 and the ADEQ approved closure in place on February 15, 2008. (See Compliance Schedule in Section 3.2, Items 15 and 16 for a summary of completed requirements.)

C. Post-Closure Requirements

The permittee initiated post-closure BADCT performance standard inspection and monitoring of the facility in accordance with Table 4.2-15. The permittee shall continue BADCT performance standard inspection and monitoring in accordance with the requirements listed in Section 2.5.2 and Table 4.2-15.

2.2.1.11 Outfall 001

A. Current Configuration

Prior to temporary cessation of mine dewatering in May 1998, underground mine water was pumped from the No. 3 and No. 9 Shafts, and discharged into the mine water treatment circuit at the West Plant Site. Past discharges generated by mineshaft dewatering, milling operations (mill water) and discharges related to stormwater run-off were routed via Outfall 001 to Queen Creek only when the Indian Ponds were at capacity. The pump back system at the discharge from the Indian Ponds currently diverts stormwater to Tailings Pond 6 where the stormwater is allowed to evaporate for disposal. The West Plant Site stormwater does not currently discharge at Arizona Pollutant Discharge Elimination System (AZPDES) discharge Outfall 001 during routine operations.

B. Closure Requirements

Outfall 001 discharge shall consist of seepage pumping (variable, as needed, and only during storm events) and stormwater runoff (0 – 200 gallons per minute, as needed). This outfall shall remain open after final closure configuration and shall be designed to allow discharge to Queen Creek from the non-contact stormwater system, pursuant to a valid Arizona Pollutant Discharge Elimination

System (AZPDES) permit (AZ0020389). The pump back system shall be closed before the Tailings Pond 6 Stormwater Pond is removed. Discharge monitoring at Outfall 001 shall be performed in accordance with the requirements of the AZPDES and Section 2.5.1 of this permit for contingency monitoring.

2.2.1.12 Wastewater Treatment Plant, East Plant Site

The former Wastewater Treatment Plant (WWTP) was located at the Superior Mine East Plant Site. The WWTP was used to treat sewage, and did not treat mine process water or mine dewatering water. Treated wastewater was reportedly commingled with treated mine dewatering water and discharged at Outfall 001 to Queen Creek. The treatment plant ceased operation in 1997 when mine operations ceased. The East Plant Site is now reoccupied for exploration activities and at present sewage is placed in two holding tanks and hauled off-site for disposal. The East Plant Site is not included in this APP.

The permittee submitted the *Wastewater Treatment Plant and East Plant Site Determination Report* (Determination Report) along with a clean closure application to ADEQ in May 2007. ADEQ issued the clean closure approval in May 2009. No additional permit requirements apply to this facility. (See Compliance Schedule in Section 3.2, Item 51 for a summary of completed requirements.)

2.2.1.13 Smelter Affected Soils

Closure of the Smelter Affected Soils is being performed under the Voluntary Remediation Program. (See Compliance Schedule in Section 3.2, Items 31, 32, 33 and 34.)

2.2.1.14 Stormwater Diversion Structures and Berms

A. Background

There are three major watersheds draining the West Plant site: the Apex Tunnel Watershed, the Tailings Pond 6 Watershed, and the Southeastern Watershed.

Apex Tunnel Watershed – This watershed is formed by the Apex Berm and Apex Tunnel. The berm diverts upgradient run-on from the Apex Wash and non-contact runoff from the West Plant Site to the tunnel, thence to an unnamed wash that discharges to the Silver King Wash. The Silver King Wash discharges to Queen Creek, downgradient of the West Plant Site. The berm and tunnel have been sized to pass the ½ probable maximum flood.

Tailings Pond 6 Watershed – This watershed consists of the portion of the Apex Tunnel Watershed that is downgradient of the Apex Berm. The watershed drains non-contact run-on and runoff from the West Plant Site. The runoff is collected in Tailings Ponds 5, 6 and 7 and is retained in Tailings Pond 6 for disposal by evaporation.

Southeastern Watershed – This watershed drains the remainder of the West Plant Site and is further subdivided into the Upper Watershed, the Middle Watershed and the Lower Watershed. The Upper Watershed is largely undisturbed but contains the 500 Yard Waste Rock facility (closed in-place), the

Mill Sands Pond (clean closed) and APP-exempt development rock piles. The Middle Watershed contains Settling Ponds 1 and 2 (closed in-place), the Smelter Pond (closed-in-place) and APP-exempt tailings ponds. The Lower Watershed contains the Depot Pond (clean closed), the Indian Ponds (clean closed) and the APP-exempt slag pile. Runoff is conducted by existing channels to the north end of Tailings Ponds 3 and 4 (APP exempt), between Tailings Pond 1 and 2 and Tailings Pond 3 and 4, to the Indian Ponds. The stormwater collected in the Indian Ponds is pumped up to Tailings Pond 6 for storage.

B. Closure Requirements

The permittee shall design a new non-contact stormwater system for a final closure configuration. Facilities that are closed in place under this APP and diversion channels that protect those facilities from 100-year, 24-hour storm events shall be regulated under this APP. (Except where otherwise noted, the design storm shall be the 100-year, 24-hour event.).

Final closure configuration of the regulated facilities and diversion channels shall be designed, constructed and maintained to ensure that only non-contact stormwater is discharged from the mine site in accordance with applicable BADCT requirements as follows:

Apex Tunnel Watershed – The Apex Berm and Apex Tunnel shall continue to divert upgradient run-on from the Apex Wash and non-contact runoff from the West Plant Site to the Apex Tunnel, then to an unnamed wash that discharges to the Silver King Wash, thence to Queen Creek. The berm and tunnel shall be maintained to ensure they pass the ½ probable maximum flood.

Tailings Pond 6 Watershed – After full closure configuration is achieved stormwater shall be routed over Tailings Ponds 5, 6 and 7 in channels constructed as described in Sections 2.2.1.5 and 2.2.1.6 and directed to an unnamed wash, where it will discharge to Queen Creek.

Southeastern Watershed – Three non-contact stormwater ponds connected by non-contact stormwater channels and culverts shall route non-contact stormwater around the APP-regulated facilities (the 500 Yard Waste Rock facility, Settling Ponds 1 and 2, the Smelter Pond, and the Indian Ponds). Except for the 500 Yard, where two 60-inch culverts pass non-contact stormwater through the facility and the channel along the north perimeter of the closed Smelter Pond, no other portion of the non-contact stormwater system in the Southeastern Watershed shall pass over or through APP-regulated facilities.

The three non-contact stormwater ponds in the Southeastern Watershed are exempt from APP program regulation but are described below:

CP-6 Pond (APP-exempt) – This proposed non-contact stormwater detention pond, located north-northwest of the Never Sweat Tunnel, will receive runoff from the upper part of the watershed and will route the runoff through a series of pipes, culverts and a channel into the CP-102 Pond (below).

CP-102 Pond (APP-exempt) – This non-contact stormwater detention pond, located southeast of the former, clean closed Mill Sands Pond, will receive

runoff from the upper and middle parts of the watershed and will route the runoff through a culvert and channel into the new Indian Ponds (below).

New East and West Indian Ponds (APP exempt after final closure) – As stated in Section 2.2.1.3, the existing Indian Ponds will be removed/clean closed. These will be replaced by new non-contact stormwater ponds that will receive runoff from the middle and lower parts of the watershed. The Indian Ponds will discharge to Queen Creek through a channel and culvert to Outfall 001.)

2.2.1.15 Structural Fill

Structural fill shall be used for construction of berms, channels, vee ditches and other structures to meet stability requirements. Structural fill shall: (a) have a gradation suitable to achieve required compaction; (b) consist of well-graded soils having a maximum particle size of 9 inches, less than 55% fines (material passing a #200 sieve) and a maximum plastic limit of 25; (c) be non-mineralized and uncompacted; and (d) not be mine material. On-site and off-site sources of structural fill shall be acceptable, subject to the above requirements and final design specification. Acceptable on-site sources for structural fill shall include undersize material stockpiled at the former quarry for decorative rock. Structural fill shall be placed in maximum 12-inch lifts and compacted to 95% of the maximum dry density per the Standard Proctor test (ASTM D1557). Soils shall be moisture conditioned to plus or minus 2% of the optimum moisture content, or to that moisture content that allows compaction to the required density without an excessive amount of effort that achieves a stable non-yielding surface.

2.2.1.16 Mass Grading Fill

Mass grading fill for closed in-place facilities may consist of: (i) “mine materials,” such as pond bottom sediment, channel sediment, smelter-affected soil, development rock piles (e.g., No. 1 and 2 Pile, Magma Fault Pile and Roadside Pile) and other small miscellaneous piles of mine-related rock; and (ii) “natural materials,” such as alluvial fan, Gila Conglomerate and inert stockpile materials, *provided* the materials do not exhibit the characteristics of ignitability, corrosivity, reactivity or toxicity at 40 C.F.R. §§ 261.21 through 261.24. Materials with a paste pH less than 5.5, with a paste electrical conductivity (EC) greater than 4,000 micromhos per centimeter ($\mu\text{mh}/\text{cm}$), containing regulated pollutants at concentrations exceeding non-residential soil remediation standards or groundwater protection levels (GPLs) shall be used as mass grading fill only at closed in-place facilities.

Mass grading fill for clean closed facilities may consist of the same “mine materials” and “natural materials” described in the preceding paragraph, *provided* the materials do not: (a) exhibit the characteristic of ignitability, corrosivity, reactivity or toxicity at 40 C.F.R. §§ 261.21 through 261.24; (b) have a paste pH less than 5.5; (c) have a paste EC greater than 4,000 $\mu\text{mh}/\text{cm}$; (d) contain regulated pollutants at concentrations exceeding non-residential soil remediation standards; (e) contain regulated pollutants at concentrations exceeding GPLs; (f) exhibit evidence of sulfide mineralization; or (g) have the potential to generate acid.

All “mine materials” used as mass grading fill for closed facilities shall be

derived from sources already on the West Plant Site as of February 22, 2007 except as provided in Section 2.2.1.7.

If a facility to be closed in place includes saturated tailings or exhibits no separation between the material in the impoundment and groundwater, then mass grading fill may not be used to close the facility, unless the permittee conducts a BADCT stability analysis and a groundwater analysis that demonstrates the use of the mass grading fill will not cause an impoundment failure or additional discharge to groundwater.

Mass grading fill shall be placed in maximum 3-foot lifts, and compacted with three (3) passes of the construction equipment. There are no moisture content or density requirements for placement of mass grading fill.

2.2.1.17 Cover Material

Material used for the construction of revegetated covers at closed in-place facilities may derive from on-site or off-site sources, and both "mine material" and "natural material" (described in Section 2.2.1.16) may be used, *provided* the material: (a) contains a range of particle sizes, including fines for water holding capacity and rock fragments for erosion resistance; (b) is chemically suitable for vegetation (i.e., inert); (c) contains less than 25% clay; (d) complies with other BADCT requirements applicable to revegetated covers; (e) does not contain contaminants at concentrations equal to or greater than the toxicity characteristic thresholds at 40 C.F.R. § 261.24 using EPA test Method 1311; and (f) if the material is from an off-site source, is not a hazardous waste under the Resource Conservation and Recovery Act (RCRA).

Material used for construction of revegetated covers at clean closed facilities may consist of the same materials from the same sources described in the preceding paragraph, shall meet the same requirements imposed in the preceding paragraph, and shall not: (a) contain regulated pollutants at concentrations exceeding GPLs; (b) have a paste pH less than 5.5; (c) have a paste electrical conductivity (EC) more than 4,000 $\mu\text{mhos/cm}$; (d) exhibit evidence of sulfide mineralization; (e) have the potential to generate acid; or (f) contain regulated constituents at concentrations exceeding applicable non-residential soil remediation standards.

Cover material shall be placed in maximum 3-foot lifts. Wheel traffic shall be kept to a minimum during placement of cover material to minimize residual compaction. After placement of the soil materials, the upper 1-foot thickness shall be ripped or harrowed as required for the specified revegetation method.

2.2.1.18 Armor Rock

Armor rock shall be used for riprap in surface water channels and other erosion control works. Rock shall be durable, angular if possible, blocky in shape, and available in sizes from coarse gravel to cobbles and boulders. Physical properties shall be based on American Society for Testing and Materials (ASTM) D4992, *Standard Practice for Evaluation of Rock to be Used for Erosion Control*. In accordance with this standard, laboratory tests shall measure physical properties and simulate weathering. Physical property tests

shall include bulk specific gravity, absorption, and Los Angeles Abrasion. Bulk specific gravity shall be considered an indication of the quality of the rock and also a measure of its resistance to movement in flow. Absorption shall provide a quantitative measure of the amount of moisture absorbed by the rock, which relates to the wearing resistance of the rock during hauling and placement. The Sodium Sulfate Soundness test shall relate to weathering performance once the rock is emplaced. Sodium sulfate expands as it dries, simulating cycles of freeze-thaw. Acceptable ranges for physical properties shall be based on *Bureau of Reclamation Experience in Testing of Riprap for Erosion Control of Embankment Dams* by J.A. Farar (1993) in ASTM STP 1177, *Rock for Erosion Control*.

Armor rock shall be non-mineralized. The presence or absence of mineralization shall be visually evaluated in the field, and if mineralization is observed, samples shall be sent for additional laboratory testing of total metals, leachable metals, and the potential to generate acid.

Acceptable on-site sources for armor rock shall be limestone quarries formerly used for silica flux, such as Quarry No. 1 and Quarry No. 2. Small quantities of stockpiled rock available at the former quarry for decorative rock shall be an acceptable source. An acceptable off-site source is the commercial quarry at Raymert, Arizona.

Riprap shall be placed to the thickness defined for each surface water channel, and shall be track-walked in-place by the construction equipment to provide a uniform surface.

2.2.1.19 Final Grading

Final grading for closed in-place facilities shall be performed to construct 1% minimum slopes per specifications of the permit application or as otherwise specified by this permit to prevent ponding of stormwater on the cover material.

2.2.2 Site-specific Characteristics

Site-specific characteristics were not considered for closure BADCT.

2.2.3 Inspection, Repair and Reporting Requirements

2.2.3.1 Facility Closure Reporting

The permittee shall submit closure reports in accordance with Section 2.7.4.3.

2.2.3.2 BADCT Performance Inspection and Monitoring

Permitted facilities shall be inspected for performance levels listed in Section 4.0, Table 4.2-15. Results of these inspections shall be documented and maintained in the APP Facility Log Book for at least 10 years, as required by Section 2.7.2.

2.2.3.3 Repair and Reporting

If any damage of permitted facilities is identified during inspection, proper repair procedures shall be promptly performed. All repair procedures and material(s) used shall be documented in the Annual Report or in accordance with Section 2.7.3 for permit

violations and alert level (AL) exceedances that are more than routine as required by Table 4.2-15.

2.3 Discharge Limitations [A.R.S. §§ 49-201(14), 49-243 and A.A.C. R18-9-A205(B)]

The permittee shall maintain all permitted facilities to prevent unauthorized discharges pursuant to A.R.S. § 49-201(12) resulting from failure or bypassing of BADCT pollutant control technologies including cover failure, uncontrollable leakage, slope failure, berm breaches that result in an unexpected loss of fluid, accidental spills, or other unauthorized discharges. The discharge limitations in this section are not applicable to any discharge caused by precipitation in excess of a single 100-year, 24 hour storm event.

2.4 Points of Compliance (POC) [A.R.S. § 49-244] and Alert Well

The POCs are established by the following monitoring location(s):

Locations	Latitude	Longitude	ADWR Registration No.
Existing POC Monitoring Wells			
MCC-3C	33°17'40.02"N	111°06'19.57"W	55-563618
MCC-4	33°17'13.75"N	111°07'00.07"W	55-548187
MCC-6C	33°17'56.00"N	111°07'013.13"W	55-563622
MCC-9	33°17'32.68"N	111°06'25.88"W	55-563621
GAI-02-01	33°17'57.05"N	111°06'48.92"W	55-591860
Indian Ponds-POC	33°17'13.6"N	111°06'53.3"W	55-907037
Smelter Pond-POC	33°17'29.8"N	111°06'25.5"W	55-906300
500 Yard - POC	33°17'56.9"N	111°05'45.4"W	55-907035
TP 5 POC-B ¹	33° 18' 0.389"N	111° 6' 25.805"W	55-910698
Existing AL Monitoring Well			
SP 1 & 2-Alert Well-B ²	33° 18' 1.380"N	111° 6' 14.415"W	55-910699

Compliance with AQLs shall be determined at POC locations. The alert well shall be used for early detection and response, not for determining compliance with AQLs. Monitoring requirements for each POC are listed in Section 4.2, Tables 4.2-1 through 4.2-9. Monitoring requirements for the alert well are listed in Section 4.2, Table 4.2-10 and 11.

The Director may amend this permit to designate additional POCs, if information on groundwater gradients or groundwater usage indicates the need.

2.4.1 POC Wells

The permittee shall use GAI-02-01, MCC-3C, MCC-4, MCC-6C and MCC-9, which were installed prior to February 22, 2007, as POC wells. The permittee shall perform compliance groundwater monitoring in accordance with Section 2.5.3 of this permit and the related tables in Section 4.2.

The permittee shall use Indian Ponds-POC, Smelter Pond-POC, 500 Yard-POC, and TP 5 POC-B, which were installed after February 22, 2007, as POC wells. The permittee shall use SP1&2-Alert

¹ This well is a replacement well installed by the permittee because the water table was above the screened interval in the original well.

² This well is a replacement well installed by the permittee because the water table was above the screened interval in the original well.

Well-B as an alert well. The permittee shall perform compliance groundwater monitoring at this well in accordance with Section 2.5.3 of this permit and the related tables in Section 4.2.

The permittee shall perform ambient groundwater monitoring at replacement POC monitoring wells (MCC-6C and MCC-9) once installed, followed by compliance groundwater monitoring at these wells, in accordance with Section 2.5.3 of this permit, the Compliance Schedule in Sections 3.0, and 3.1 and the related tables in Section 4.2

2.4.2 New Well Design and Installation

The permittee shall submit design specification for any other wells that may be installed for ADEQ's prior review and approval. The wells shall be designed with appropriate surface seals, annular seals to prevent cross contamination, plugs above the filter pack to prevent cement grout intrusion into the filter pack and screen, and filter pack and screen size selected for the lithology of the screened interval.

All new wells shall be developed after installation and allowed to recover at least one week prior to collection of an initial groundwater sample.

2.4.2.1 Well Installation Reports

The permittee shall submit well installation reports in accordance with Section 2.7.4.

2.4.2.2 Replacement Wells

In the event that a POC well or alert well should become unusable or inaccessible due to damage, a significant decrease and/or increase in water level, or any other event, a replacement well shall be constructed and installed within 60 days upon approval by ADEQ and pursuant to a corresponding permit amendment. If the replacement well is no more than fifty (50) feet from the original well, then all AQLs or ALs established for the original well in this APP and pursuant to Section 2.5.3.1 and Section 2.7.4.2 shall apply to the replacement well.

2.5 Monitoring Requirements [A.R.S. § 49-243(K)(1), A.A.C. R18-9-A206(A)]

All monitoring required in this permit shall continue for the duration of the permit, regardless of the status of the facility. Monitoring shall commence the first full monitoring period following permit issuance. All sampling, preservation and holding times shall be in accordance with currently accepted standards of professional practice. Trip blanks, equipment blanks (if non-disposable equipment is used) and duplicate samples shall also be obtained, and Chain-of-Custody procedures shall be followed, in accordance with currently accepted standards of professional practice. The permittee shall develop a site specific Quality Assurance Project Plan (QAPP) that describes the sample collection and analysis procedures to ensure that the result of work performed under this permit will satisfy the data quality objectives of the permit. The permittee shall be responsible for the quality and accuracy of all data required by this permit. If a third party collects or analyzes samples on behalf of the permittee, the permittee shall obtain a copy of the third party site specific QAPP. The permittee shall consult with the most recent version of the ADEQ Quality Assurance Program Plan and Title 40, PART 136 of the Environmental Protection Agency's (EPA) Code of Federal Regulations (CFR) for guidance in this regard. Copies of laboratory analyses and Chain-of-Custody forms shall be maintained at the permitted facility. Upon request, these documents shall be made immediately available for review by ADEQ personnel.

2.5.1 Discharge Monitoring

As discussed in Section 2.2.1.11, the permittee is authorized by an AZPDES permit, Permit No.

AZ0020389, to discharge seepage pumping during storm events and storm water runoff from Outfall 001 to an unnamed wash tributary to Queen Creek. In the event of an exceedance of a limit established in the AZPDES permit, the permittee shall (a) Notify the ADEQ within five (5) days after becoming aware of the exceedance; and (b) submit a written report to ADEQ within thirty (30) days after becoming aware of the exceedance. Based on the exceedance, ADEQ may amend this permit to include monitoring of discharges to the outfall or installation and monitoring of a POC well downgradient of the outfall, if wells already installed are not in suitable locations to determine compliance with AWQS.

2.5.2 Facility BADCT Monitoring

The permittee shall perform BADCT Performance Standard Inspection & Monitoring, including routine inspections of APP discharging facilities, in accordance with Section 4.2. In the event of a BADCT failure, the permittee shall comply with the requirements of Table 4.2-15, Section 2.7.3 and, if appropriate, Section 2.6.3.

2.5.3 Groundwater Monitoring and Sampling Protocols

Static water levels shall be measured and recorded prior to sampling. Wells shall be purged of at least three borehole volumes (as calculated using the static water level) or until field parameters (pH, temperature, and conductivity) are stable, whichever represents the greater volume. If evacuation results in the well going dry, the well shall be allowed to recover to 80 percent of the original borehole volume, or for 24 hours, whichever is shorter, prior to sampling. If after 24 hours there is not sufficient water for sampling, the well shall be recorded as "dry" for the monitoring event. An explanation for reduced pumping volumes, a record of the volume pumped, and modified sampling procedures shall be reported and submitted with the Self-Monitoring Report Form (SMRF).

As an alternative method for sampling, the permittee may conduct the sampling using the low-flow purging method described in the Arizona Water Resources Center March 1995 Field Manual for Water Quality Sampling. Under this method, the well must be purged until at least two indicator parameters stabilize. Indicator parameters shall include dissolved oxygen, turbidity, pH, temperature and conductivity.

2.5.3.1 Ambient Groundwater Monitoring

The permittee shall conduct monthly ambient groundwater monitoring for a total of eight (8) quarters at replacement POC wells, MCC-6C and MCC-9, in order to establish background water quality, as specified in Section 2.4.1; Section 2.4.2; the Compliance Schedule in Section 3.0; and Table 4.2-14.

Based on the ambient groundwater monitoring results for these wells, the permittee shall submit an Ambient Groundwater Monitoring Report and a request for a permit amendment to incorporate proposed AQLs and ALs in Section 4.2, in accordance with Section 2.7.4.4; the Compliance Schedule in Section 3.1; and Tables 4.2-12 and 13.

2.5.3.2 Quarterly Compliance Monitoring

The permittee shall perform quarterly compliance monitoring of the POC wells and the Alert Well as specified in Section 4.2, Tables 4.2-1 through 14. The results of the monitoring shall be compared to the AQLs and ALs. If the results indicate an exceedance of an AL or violation of an AQL, then the permittee shall comply with Section 2.6.2.3.2 or Section 2.6.4, as appropriate.

If volatile organic constituents (VOCs) and/or semi-volatiles (SVOCs) are detected in the Alert Well at concentrations above the AL specified in Table 4.2-11, then the permittee shall also comply with Section 2.6.2.3.4.

The permittee shall submit reports of the quarterly compliance monitoring in accordance with the reporting schedule at Section 2.7.6.

2.5.4 Analytical Methodology

All samples collected for compliance monitoring shall be analyzed using Arizona state approved methods. If no state approved method exists, then any appropriate EPA approved method shall be used. Regardless of the method used, the detection limits must be sufficient to determine compliance with the regulatory limits of the parameters specified in this APP. Analyses shall be performed by a laboratory licensed by the Arizona Department of Health Services, Office of Laboratory Licensure and Certification. For results to be considered valid, all analytical work shall meet quality control standards specified in the approved methods. A list of Arizona state certified laboratories can be obtained at the address below:

Arizona Department of Health Services
Office of Laboratory Licensure and Certification
250 North 17th Avenue
Phoenix, AZ 85007
Phone: (602) 364-0720

2.5.5 Installation and Maintenance of Monitoring Equipment

Monitoring equipment required by this APP shall be installed and maintained so that representative samples required by the APP can be collected. If new groundwater wells are determined to be necessary, the construction details shall be submitted to ADEQ for approval prior to installation and the APP shall be amended to include the wells.

2.6 Contingency Plan Requirements [A.R.S. § 49-243(K)(3), (K)(7) and A.A.C. R18-9-A204 and R18-9-A205]

2.6.1 General Contingency Plan Requirements

At least one copy of this permit and the approved contingency and emergency response plans submitted in the application in Volume 2, Section 8 of the APP application dated June 24, 2005, the Technical Memorandum dated September 18, 2006 and this permit shall be maintained at the location where day-to-day decisions regarding the operation of the facility are made. The permittee shall be aware of and follow the contingency and emergency plans.

Any exceedance of an AL in Tables 4.2-1 through 14, or violation of an AQL; a control technology failure; or a violation of another material condition of this APP shall be reported to ADEQ following the reporting requirements in Section 2.7.3.

Where verification sampling is authorized in this permit, it shall be the option of the permittee to perform such sampling. If the permittee performs verification sampling, it shall do so at the same location where the exceedance occurred in accordance with Section 2.6.2.3.2, 2.6.2.3.4 or 2.6.4, as appropriate. Collection and analysis of the verification sample shall use the same protocols and test methods that indicated the exceedance. If verification sampling is not conducted within the timeframe allotted, ADEQ and the permittee shall presume the initial sampling result to be

confirmed, as specified in Section 2.6.2.3.2, 2.6.2.3.4 or 2.6.4.

The permittee shall comply with all contingency plans relating to the exceedance of an AL, AWQS or AQL or control technology failure, as specified further below.

2.6.2 Exceeding of Alert Levels

2.6.2.1 Exceeding of Alert Levels Set for BADCT Performance Monitoring

If a performance level for BADCT performance inspections and monitoring in Section 4.2, TABLE 4.2-15 has been exceeded, the permittee shall: (a) Notify the ADEQ within five (5) days after becoming aware of the exceedance, in accordance with Section 2.7.3(A); and (b) submit a written report within thirty (30) days after becoming aware of the exceedance, in accordance with Section 2.7.3(B).

The facility shall no longer be considered on alert status once the indicator no longer indicates a performance level is being exceeded. The permittee shall, however, complete all tasks necessary to return the facility to its pre-alert condition.

2.6.2.2 Exceeding of Alert Levels Set for Discharge Monitoring

Alert Levels have not been established for the AZPDES-permitted discharges described in Section 2.5.1.

2.6.2.3 Exceeding of Alert Levels in Groundwater Monitoring

2.6.2.3.1 Alert Levels for Indicator Parameters

Not Applicable

2.6.2.3.2 Alert Levels in POC Wells or Alert Well

- A. If an AL for a pollutant set in Section 4.2, Tables 4.2-1 through 10 and Tables 4.2-12 through 13, is exceeded in a POC Well or an Alert Well, the permittee may conduct verification sampling no later than five (5) days after learning of the exceedance. If verification sampling does not verify the exceedance, then the initial exceedance shall be reported in the Annual Monitoring and Compliance Report and no further action shall be required of the permittee for that event.
- B. If verification sampling confirms the exceedance, or if the permittee opts not to perform verification sampling, then the permittee shall:
 1. Notify ADEQ within five (5) days after verifying or learning of the exceedance, in accordance with Section 2.7.3(A);
 2. Immediately initiate an investigation of the cause of the exceedance, including inspection of all APP discharging units and all related pollution control devices, review of any operational and maintenance practices that might have resulted in an unexpected discharge, and hydrologic review of groundwater conditions including upgradient water quality;
 3. Increase the frequency of monitoring at the location of the exceedance to monthly;
 4. Submit a written report based on the investigation within thirty (30) days after verifying or learning of the exceedance, in accordance with Section 2.7.3(B); and
 5. Take actions that may be necessary as a result of the exceedance

under Section 2.6.5.

- C. As part of its written report, the permittee may include a technical demonstration that although an AL has been exceeded, pollutants are not reasonably expected to cause a violation of an AQL. The demonstration may propose a revised AL or monitoring frequency for ADEQ approval.
- D. Based on the written report, ADEQ may, if necessary: (1) amend the APP to require a revised AL, increased frequency of monitoring or additional monitoring; and (2) authorize corrective action in accordance with Section 2.6.6.
- E. Any increased frequency of monitoring required under this section may subsequently be reduced to quarterly, if the results of four sequential sampling events demonstrate no ALs are exceeded.
- F. If the exceedance continues for four sequential sampling events, then the permittee shall prepare and submit for ADEQ approval a hydrogeologic investigation workplan within thirty (30) after receiving the laboratory results of the fourth sampling event. The workplan shall assess whether the exceedance is due to natural or anthropogenic causes and, if exceeded values are found to be related to APP-regulated facilities within the mine site or results are inconclusive, the nature and extent of the discharge. This hydrogeologic investigation shall become the basis of adjusting permit conditions and/or designing corrective action.
- G. As specified in Section 2.7.4.9, the permittee shall submit a contingency plan, if necessary, for additional corrective action measures that might be taken in the event of an exceedance of an AL in the Alert Well and a corresponding request for "other" amendment to include the additional measures in this APP. (See Compliance Schedule in Section 3.2, Item 11, for a summary of completed requirements).

2.6.2.3.3 Alert Levels to Protect Downgradient Users from Pollutants Without Numeric Aquifer Water Quality Standards

Not Applicable

2.6.2.3.4 Alert Levels for VOCs and Semi-VOCs in Alert Well

- A. If an AL for a VOC and/or semi-VOC specified in Table 4.2-11 is exceeded in the Alert Well, the permittee may conduct verification sampling no later than five (5) days after learning of the exceedance. If verification sampling does not verify the exceedance, then the initial detection shall be reported in the Annual Monitoring and Compliance Report and no further action shall be required of the permittee for that event.
- B. If verification sampling verifies the exceedance, or if the permittee opts not to perform verification sampling, then the permittee shall:
 - 1. Notify ADEQ within five (5) days after verifying or learning of the exceedance, in accordance with Section 2.7.3(A);
 - 2. Submit the laboratory results documenting the exceedance within thirty (30) days after verifying or learning of the

- exceedance;
- 3. Take actions that may be necessary as a result of the exceedance under Section 2.6.5; and
- 4. If the exceedance continues for two (2) quarters, submit a workplan for the assessment of the VOC in the vicinity of Settling Ponds 1 and 2, implement the workplan once it is approved by ADEQ, and take any necessary corrective action according to Section 2.6.6. The workplan shall include measures to assess the full extent of the VOC and/or semi-VOC in the vicinity of Settling Ponds 1 and 2 and perform a hydrologic review of groundwater conditions including upgradient water quality and groundwater flow directions and velocity.
- C. In lieu of a workplan, the permittee may submit a technical demonstration that VOCs and/or semi-VOCs are not reasonably expected to cause a violation of an AQL at a POC. If the alternate demonstration is submitted, it shall include a proposal for the installation and/or appropriate monitoring of a POC well downgradient of the Alert Well.
- D. Based on the submittals in Paragraphs (B) and (C), ADEQ may, if necessary, amend the APP to require increased frequency of monitoring, additional monitoring or other actions necessary to address the exceedance.

2.6.3 Discharge Limitation Violations

If a DL set in Sections 2.6.3.1 or 2.6.3.2 has been violated, the permittee shall immediately investigate to determine the cause of the violation.

2.6.3.1 Containment Structure Failure or Unexpected Loss of Fluid from Regulated Ponds

If, prior to achieving their final closure configuration, there is a containment structure failure or unexpected loss of fluid at the ponds regulated under this permit, such that contact stormwater runoff or other fluid is released to the ground surface or vadose zone, the permittee shall take the following actions:

- A. As soon as practicable, cease all discharges as necessary to prevent any further releases to the environment.
- B. Within twenty-four (24) hours after discovery of the failure or loss, notify ADEQ.
- C. Within five (5) days after discovery of a failure or loss that resulted in a release to the vadose zone: (i) collect representative samples of the released fluids and analyze the samples in accordance with Table 4.3-1; and (ii) collect representative samples of potentially impacted soils and analyze the samples for acid-base accounting and relevant GPLs.

- D. Within fifteen (15) days after discovery of the failure or loss, initiate an evaluation to determine the cause for the incident and identify the circumstances that resulted in the incident and assess the condition of the pond; and, as soon as practicable thereafter, perform corrective actions as necessary to resolve the problems identified in the evaluation and prevent further releases to the vadose zone, including repairs to any system, structure or other component as needed to restore proper functioning of the pond.
- E. Do not resume discharging to the pond until the corrective actions are completed and the pond is restored to its proper operating condition.
- F. Record corrective actions used to restore the pond in the facility log/recordkeeping file and maintain the file available for ADEQ review.
- G. Within thirty (30) days after discovery of the failure or loss, submit a report to ADEQ in accordance with Section 2.7.3(B), including a description of the actions taken pursuant to Paragraphs (A) through (F), above. Upon review of the report, ADEQ may request additional monitoring or corrective actions.
- H. Within sixty (60) after discovery of the failure or loss, conduct an assessment of the impacts to the vadose zone or groundwater resulting from the incident. If the vadose zone or groundwater is impacted such that it could cause or contribute to an exceedance of an AQL at the applicable point of compliance, submit to ADEQ, for approval, a corrective action plan including measures to address the impacts, remedial actions and/or monitoring, and a schedule for completion of activities, in accordance with Section 2.6.6. At the direction of ADEQ, the permittee shall implement the approved corrective action plan.
- I. Within thirty (30) days after completion of the approved corrective action plan, submit a report in accordance with Section 2.6.6. Upon review of the report, ADEQ may amend the APP to require additional monitoring, increased frequency of monitoring, amendments to permit conditions, or other actions.

2.6.3.2 Failure of BADCT Closure Configuration for Closed In-place Facilities

In the event of a failure of a BADCT closure component of a permitted facility, the permittee shall act to correct the condition that resulted in the failure. A failure is defined as an event that significantly compromises the intended function of the closure component and falls outside the scope of typical maintenance activities. The closure components are defined as recontouring, cover, run-on controls, run-off controls, and vegetation. The types of failures include:

- A. Differential settlement of fill that results in standing water on covers or channels.
- B. Slope mass failure, such as slumps, slides, debris flows, or rotational blocks.
- C. Exposure of covered mine materials by gullies, sheet erosion, scour, or cracks.
- D. Loss of flow capacity for run-on and run-off controls by sediment aggradation, breach, debris accumulation, or vegetation.
- E. Significant loss of vegetation due to fire, infestation, flooding, or drought.

If any of the above failures occur, the permittee shall take the following actions:

- A. Within twenty-four (24) hours after discovery of the failure, notify ADEQ;
- B. Within fifteen (15) days after discovery of the failure, initiate an evaluation to determine the cause and impact of the failure;
- C. Within thirty (30) days after discovering the failure, submit a report in accordance with Section 2.7.3(B);
- D. As soon as practicable given the scale of the failure, perform corrective action to eliminate the cause and restore the intended function of the closure component; and,
- E. Within thirty (30) days after completion of the corrective action, submit a report of the corrective action.

If the surface soil or vadose zone is impacted by the failure, such that it could cause or contribute to an exceedance of an AQL at the applicable point of compliance, the permittee shall:

- A. Within five (5) days after discovery of the failure: (i) collect representative samples of the released fluids and analyze them in accordance with Table 4.3-1; and (ii) collect representative samples of potentially impacted soils and analyze the samples for acid-base accounting and relevant constituents with minimum, alternative or site-specific GPLs.
- B. Within fifteen (15) days after discovery of the failure, initiate an evaluation to determine the nature and extent of the affected surface soil, vadose zone or groundwater. The evaluation may include vadose zone and groundwater modeling to assess fate and transport and characterization activities to assess the need for corrective action.
- C. As soon as practicable given the scale of the failure but no later than one hundred and eighty (180) days after discovery of the failure, submit a corrective action plan to address the impacts of the failure, including identification of remedial actions and/or additional monitoring, and a schedule for completion of the activities.
- D. Implement the approved corrective action.
- E. Within thirty (30) days after completion of the corrective action, submit a report of the corrective action.

2.6.4 Violation of Aquifer Quality Limits in POC Wells

- A. If an AQL for a pollutant specified in Section 4.2 is violated in a POC Well, the permittee may conduct verification sampling no later than five (5) days after learning of the violation. If verification sampling does not verify the violation, then the initial violation shall be reported in the Annual Monitoring and Compliance Report and no further action shall be required of the permittee for that event.
- B. If verification sampling confirms the violation, or if the permittee opts not to perform verification sampling, then the permittee shall:
 - 1. Notify ADEQ within five (5) days after confirming or learning of the violation, in accordance with Section 2.7.3(A);
 - 2. Immediately initiate: (a) a BADCT systems evaluation for the cause of the violation, including an inspection of all facilities regulated under this permit and corresponding pollution control devices, and a review of any operational or maintenance practices that might have resulted in an unexpected discharge; and (b) a hydrogeologic assessment of the violation, including groundwater modeling, review of groundwater conditions and upgradient water quality, groundwater contours, and an inventory of downgradient well users and types of uses;

3. Increase the frequency of monitoring at the location of the violation to monthly;
 4. Submit a written report based on the investigation within thirty (30) days after becoming aware of the violation, in accordance with Section 2.7.3; and
 5. Take actions that may be necessary as a result of the violation under Section 2.6.5.
- C. As part of its written report, the permittee may include a technical demonstration that the violation was not caused or contributed to by pollutants discharged from a facility regulated under this APP.
 - D. Based on the written report, ADEQ may, if necessary: (1) amend the permit to require increased frequency of monitoring or additional monitoring; and (2) authorize corrective action including measures to control the source of a discharge causing the violation (including BADCT correction if necessary); remediate affected soils, surface water or groundwater; and mitigate the impact of the violation on existing uses of the aquifer. ADEQ's corrective action authorization may be in the form of an approval under Section 2.6.6, an amendment of this permit or approval of a contingency plan.
 - E. If the violation continues for one hundred and twenty (120) days, then the permittee shall notify downgradient or downstream users who may be directly affected by the violation.
 - F. If the violation continues for one hundred and eighty (180) days, then the permittee shall prepare and submit for ADEQ approval a hydrogeologic investigation workplan within thirty (30) after receiving the laboratory results of the sixth sampling event. The workplan shall assess whether the violation is due to natural or anthropogenic causes and, if exceeded values are found to be related to APP-regulated facilities within the mine site or results are inconclusive, the nature and extent of the discharge. This hydrogeologic investigation shall become the basis of adjusting permit conditions and/or designing corrective action.

2.6.5 Emergency Response and Contingency Requirements for Unauthorized Discharges pursuant to A.R.S. § 49-201(12) and pursuant to A.R.S. § 49-241

2.6.5.1 Duty to Respond

The permittee shall act immediately to correct any condition resulting from a discharge pursuant to A.R.S. § 49-201(12) if that condition could pose an imminent and substantial endangerment to public health or the environment.

2.6.5.2 Discharge of Hazardous Substances or Toxic Pollutants

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of suspected hazardous substances (A.R.S. § 49-201(19)) or toxic pollutants (A.R.S. § 49-243(I)) on the facility site, the permittee shall promptly isolate the area and attempt to identify the discharged material. The permittee shall record information, including name, nature of exposure and follow-up medical treatment, if necessary, on persons who may have been exposed during the incident. The permittee shall notify the Water Quality Compliance Section within twenty-four (24) hours after discovering the discharge of hazardous material which: a) has the potential to cause an AWQS or AQL to be violated; or b) could pose an endangerment to public health or the environment.

2.6.5.3 Discharge of Non-hazardous Materials

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of

non-hazardous materials from the facility, the permittee shall promptly attempt to cease the discharge and isolate the discharged material. Discharged material shall be removed and the site cleaned up as soon as possible. The permittee shall notify the Water Quality Compliance Section within twenty-four (24) hours after discovering the discharge of non-hazardous material which: a) has the potential to cause an AQL to be violated; or b) could pose an endangerment to public health or the environment.

2.6.5.4 Reporting Requirements

The permittee shall submit a written report for any unauthorized discharges reported under Sections 2.6.5.2 and 2.6.5.3 to the Water Quality Compliance Section within thirty (30) days after learning of the discharge or as required by subsequent ADEQ action. The report shall summarize the event, including any human exposure, and facility response activities and include all information specified in Section 2.7.3(B). If a notice is issued by ADEQ subsequent to the discharge notification, any additional information requested in the notice shall also be submitted within the time frame specified in that notice. Upon review of the submitted report, ADEQ may require additional monitoring or corrective actions.

2.6.6 Corrective Actions

Specific contingency measures identified in Sections 2.6.1 through 2.6.5.4 have already been approved by ADEQ and do not require written approval to implement.

With the exception of emergency response actions taken under Section 2.6.5, the permittee shall obtain written approval from the Groundwater Section prior to implementing a corrective action to accomplish any of the following goals in response to an exceedance of an AL; or a violation of an AQL, a control technology failure, or another material permit condition:

- Control of the source of an unauthorized discharge;
- Soil remediation;
- Cleanup of affected surface waters;
- Cleanup of affected groundwater; and,
- Mitigation to limit the impact of pollutants on existing uses of the aquifer.

Within thirty (30) days after completion of any corrective action, the operator shall submit to the Water Quality Compliance Section, a written report describing the causes, impacts, and actions taken to correct the problem.

For conditions lasting longer than ninety (90) days, the permittee shall submit status reports in accordance with Section 2.7.3(C) of this permit.

2.7 Reporting and Recordkeeping Requirements [A.R.S. § 49-243(K)(2) and A.A.C. R18-9-A206(B) and R18-9-A207]

2.7.1 Self-Monitoring Report Forms (SMRF)

- A. The permittee shall complete the SMRFs provided by ADEQ and submit them to the Water Quality Compliance Section, Data Unit for each quarter of monitoring conducted under Section 2.5.3.2 in accordance with the reporting schedule specified

at Section 2.7.6 and the Compliance Schedule at Sections 3.0 and/or 3.2.

- B. The permittee shall complete the SMRFs to the extent that the information reported may be entered on the forms. If no information is required during a quarter, the permittee shall enter "not required" on the SMRF and submit the report to ADEQ. The permittee shall use the format devised by ADEQ.
- C. The tables contained in Section 4.2 list the parameters to be monitored and the frequency for reporting results for groundwater compliance monitoring. Analytical methods shall be recorded on the SMRFs.
- D. In addition to the SMRF, the information contained in A.A.C. R18-9-A206(B)(1) shall be included for exceeding an AL, AWQS in Table 4.2-3, AQL, discharge limit (DL), a control technology failure, or a violation of any other material permit condition being reported in the current reporting period.
- E. SMRF reporting is not required for BADCT performance inspection monitoring. Those monitoring results shall be recorded in the Logbook in Section 2.7.2 and summarized in the Annual Report in Section 2.7.4
- F. Commencing after all new wells are installed in accordance with Section 2.4.2, the permittee shall submit quarterly groundwater contour maps with the SMRFs or for the same quarter covered by the SMRFs, using existing and new wells to determine the contours.

2.7.2 Operation Inspection/Log Book Recordkeeping

A signed copy of this permit shall be maintained at all times at the location where day-to-day decisions regarding the facility are made. A log book (paper copies, forms or electronic data) of the inspections and measurements required by this permit shall be maintained at the location where day-to-day decisions are made regarding the facility. The log book shall be retained for ten years from the date of each inspection, and upon request, the permit and the log book shall be made immediately available for review by ADEQ personnel. The information in the log book shall include, but not be limited to, the following information as applicable:

- Name of inspector;
- Date and shift inspection was conducted;
- Condition of applicable facility components;
- Any damage or malfunction, and the date and time any repairs were performed;
- Documentation of sampling date and time;
- Any other information required by this permit to be entered in the log book, and
- Monitoring records for each measurement shall comply with R18-9-A206(B)(2).

2.7.3 Permit Violation and Alert Level Exceedance Reporting

1. The permittee shall notify the Water Quality Compliance Section in writing within five days (except as provided in Section 2.6.5) of becoming aware of a violation of any permit condition, or of an Alert Level being exceeded.
2. The permittee shall submit a written report to the Water Quality Compliance Section within 30 days of becoming aware of the violation of any permit condition. The report shall document all of the following:
 - a. Identification and description of the permit condition for which there has been a violation and a description of its cause.
 - b. The period of violation including exact date(s) and time(s), if known, and the anticipated time period during which the violation is expected to continue.
 - c. Any corrective action taken or planned to mitigate the effects of the violation, or to eliminate or prevent a recurrence of the violation.
 - d. Any monitoring activity or other information which indicates that any pollutants

would be reasonably expected to cause a violation of an Aquifer Water Quality Standard.

- e. Proposed changes to the monitoring which include changes in constituents or increased frequency of monitoring.
- f. Description of any malfunction or failure of pollution control devices or other equipment or processes.

2.7.4 Miscellaneous Reporting

2.7.4.1 Annual Monitoring and Compliance Report (Annual Report)

Each year the permittee shall submit an Annual Report to ADEQ summarizing the results of the Facility's performance monitoring for the calendar year. The Annual Reports shall be submitted to ADEQ in accordance with the Compliance Schedule in Section 3.0 for the closure and post-closure periods. Results of BADCT performance inspection monitoring performed in accordance with Table 4.2-15 shall be provided in the Annual Report rather than in SMRF format. The Annual Report shall describe corrective actions performed in accordance with this permit.

2.7.4.2 Closure Reports

A. Facilities

Closure reports shall be submitted for each closed APP discharging facility and associated facilities listed below and discussed in detail in Sections 2.1 and 2.2 in accordance with the Compliance Schedule in Sections 3.1 or 3.2 after achieving closure configuration:

1. Mill Sands Pond
2. Depot Pond
3. Indian Ponds
4. Tailings Pond 6 Stormwater
5. Tailings Pond 5
6. Tailings Ponds 6 and 7
7. Settling Pond 1
8. Settling Pond 2
9. Smelter Pond

B. Report Content

The purpose of the closure report is to certify that the closures were constructed according to the Department-approved application, workplans, plans, and specifications, as applicable.

Each closure report shall contain the information specified in A.A.C. R18-9-A209(B)(3)(b) and (c), including: (1) written verification of proper fill, grade preparation, quality control, and inspection; proper liner integrity for ditches, installation procedures, quality control and inspection; and proper channel construction, quality control and inspection; (2) copies of all as-built reports, connections and workmanship, including QA/QC procedures; (3) the results of soil sampling and testing for vegetated cover material, structural fill, and mass grading fill; (4) the results of any additional sampling performed during closure that were not previously submitted to ADEQ; and (5)

final as-built plans and post-construction verification inspection results for all BADCT components related to the closure. The closure report shall be signed and sealed by an Arizona registered Professional Engineer.

2.7.4.3 Well Installation Reports

A well installation report shall be submitted to ADEQ within ninety (90) days after the completion of new well installations in accordance with Section 2.4.2 and the Compliance Schedule in Section 3.0. Each well installation report shall be completed in accordance with A.A.C. R12-15-801 et seq. and consist of the following

- Copies of Arizona Dept. of Water Resources (ADWR) Notice of Intent and all related submittals to ADWR;
- Boring log and well as-built diagram;
- Total depth of well measured after installation;
- Top of well casing or sounding tube (whichever is used as the fixed reference measuring point) and ground surface elevation;
- Depth to groundwater;
- Geophysical logging reports and subsurface sampling results, if any;
- Description of well drilling method;
- Description of well development method;
- If dedicated sampling equipment installed, details on the equipment and at what depth the equipment was installed;
- Summary of analytical results for initial groundwater sample collected after installation;
- Corresponding analytical data sheets; and
- GPS coordinates for each new well.

2.7.4.4 Ambient Groundwater Monitoring Report

The permittee shall submit a report of the ambient groundwater monitoring required under Section 2.5.3.1. This Ambient Groundwater Monitoring Report shall be submitted for each new well installed that is incorporated into the monitoring program of this permit. The report shall include summary tables of all groundwater quality data collected during the ambient groundwater monitoring period.

- A. The Ambient Groundwater Monitoring Report shall be submitted in final format after the conclusion of eight (8) consecutive quarters of ambient groundwater monitoring.
- B. The Ambient Groundwater Monitoring Report shall propose AQLs and ALs in accordance with the methods proposed by the permittee in the technical memorandum entitled Proposed Program for New Point of Compliance and Alert Wells West Plant Site, Superior, Arizona, Reference Number 053-2519-100.000, prepared by Golder Associates, dated August 29, 2006 and Section 5.0 of the technical memorandum entitled Proposed Program for Existing Point of Compliance Wells, West Plant Site, Superior, Arizona prepared by Golder Associates and dated September 18, 2006. The permittee shall submit tables of data and calculated mean values and standard deviations as described below. The permittee shall calculate a statistical value for each constituent in Table 4.2-14 of the permit using the following formula:

$$AL = \bar{x} + ks$$

Where \bar{x} = the mean, s = standard deviation, and k = one-sided normal tolerance interval with a 95% confidence level (Lieberman, G.J. (1958) Tables for One-sided Statistical Tolerance Limits: Industrial Quality Control, Vol. XIV, No. 10). Values in the sample data set determined to be statistical outliers should be excluded from the data used in the AL calculation. The following criteria shall be met in establishing AQLs and ALs in the permit:

The AL shall be calculated for a parameter using the analyses from eight (8) consecutive quarterly sample rounds in the calculation of a parameter.

Any data where the Practical Quantitation Limit (PQL) exceeds 80% of the AWQS shall not be included in the AL calculation.

If a parameter is below the detection limit, the permittee shall report the value as "less than" the numeric value for the PQL or method detection limit for the parameter, not just as "non-detect." For those parameters, the permittee shall use a value of one-half the reported detection limit for the AL calculation.

If the analytical results from more than 50% of the samples for a specific parameter are non-detects, then the AL shall be set at 80% of the AWQS.

If the calculated AL for a specific constituent and well is less than 80% of the AWQS, the AL shall be set at 80% of the AWQS for that constituent in that well.

For each of the monitored analytes for which a numeric AWQS has been promulgated in A.A.C. R18-11-406, the AQL shall be established as follows:

1. If the calculated AL is less than the AWQS, then the AQL shall be set equal to the AWQS.
2. If the calculated AL is greater than the AWQS, then the AQL shall be set equal to the calculated AL value, and no AL shall be set for that constituent at the monitoring point.

For those analyses without established AWQS, the AQL shall remain designated "NE" or "Not Established".

- C. The permittee shall submit for ADEQ approval another valid statistical method with an application for an other permit amendment prior to using an alternative method for calculating ALs and AQLs.
- D. The Ambient Groundwater Monitoring Report shall include quarterly groundwater contour maps showing the direction of groundwater flow, data summary tables for groundwater elevation and depth to groundwater data and groundwater quality data and hydrographs.
- E. The permittee shall include with the Ambient Groundwater Monitoring Report a request for a permit amendment or specify that it will be a minor

amendment only if using the methodology above to incorporate the proposed ALs and AQLs in Section 4.2 of this permit.

2.7.4.5 Discharge Impact Area (DIA) Delineation Report

The permittee submitted a report of the delineation of the DIA in accordance with the Compliance Schedule in Section 3.2 and was approved by ADEQ in May 2011. (See Compliance Schedule in Section 3.2, Items 13 and 14 for a summary of completed requirements.)

2.7.4.6 Groundwater Assessment and Groundwater Modeling Report

The permittee shall submit a groundwater modeling report in accordance with the Compliance Schedule in Section 3.0. Every five (5) years thereafter, the permittee shall update the groundwater assessment and groundwater model, in accordance with the Compliance Schedule

The groundwater modeling report shall include hydrographs, trending analysis for each well and constituents in the compliance monitoring program; stiff diagrams and/or tri-linear diagrams as appropriate; updated quarterly groundwater contour maps; and groundwater modeling to assess fate, transport and well spacing. The model shall assess the post-closure period required by this permit and recommend adjustments to the post-closure monitoring period based on aquifer properties, groundwater modeling results, trending analysis and groundwater quality data.

2.7.4.7 BADCT Assessment

Every five (5) years during the post-closure period and as required by the Compliance Schedule of the permit, the permittee shall submit an assessment of the post-closure configuration and performance of BADCT to assess whether upgrades are needed to protect closed in-place facilities. BADCT assessment may include use of modeling to assess fate and transport in the vadose zone for closed in-place facilities, if necessary based on field observations and sampling results.

2.7.4.8 Well Abandonment Reports

If monitor wells associated with this permit are abandoned due to poor performance, casing collapse, or other reasons, or are abandoned at the end of the post-closure period, then within 90 days of completing abandonment, the permittee shall submit a well abandonment report to ADEQ. Each well abandonment report shall be completed in accordance with A.A.C. R12-15-801 et seq. and consist of the following:

1. Copy of ADWR Notice of Intent to Abandon;
2. Copy of ADWR Abandonment Report;
3. A description of the methods used to seal the well casing and the perforated or screened interval of the well; and,
4. GPS coordinates of the former well location.

2.7.4.9 Contingency Plan for Alert Level Exceedances in Alert Well

Based upon the non-detects of VOCs in the AL well, a contingency plan was not necessary. (See Compliance Schedule in Section 3.2, Item 11, for a summary of completed requirements).

2.7.5 Reporting Location

All notifications, designs, workplans, reports and other documents required by this permit to be submitted to the Water Quality Compliance Section shall be directed to:

Arizona Department of Environmental Quality
Water Quality Compliance Section
Mail Code: 5415B-1
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4614

All SMRFs required by this permit shall be submitted to:

Arizona Department of Environmental Quality
Water Quality Compliance Section, Data Unit
Mail Code: 5415B-1
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4513

All notifications, designs, workplans, reports and other documents required by this permit to be submitted to the Groundwater Section shall be directed to:

Arizona Department of Environmental Quality
Groundwater Section
Mail Code: 5415B-3
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4428

2.7.6 Reporting Deadline

The following table lists the due dates for the quarterly compliance monitoring reports (SMRFs) and the Annual Report:

Compliance Monitoring Conducted During Quarter:	SMRF Due By:
February-April	May 30
May-July	August 31
August-October	November 30
November-January	February 28
Annual Report	
Annual Report	March 1

2.7.7 Changes to Facility Information in Section 1.1

The Groundwater Section and Water Quality Compliance Section shall be notified within ten (10) days of any change of facility information including Facility Name, Permittee Name, Mailing or Street Address, Facility Contact Person or Emergency Telephone Number.

2.8 Temporary Cessation [A.R.S. §49-243(K)(8) and A.A.C. R18-9-A209(A)]

Not applicable

2.9 Closure [A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9-A209(B)]

This permit is being issued to authorize closure activities specified in Sections 2.1, 2.2 of the permit. Closure plans and completion reports shall be submitted to the Groundwater Section as required by the Compliance Schedule in Sections 3.0 or 3.1 of this permit.

2.9.1 Closure Plan

The permittee shall submit for Groundwater Section approval, closure designs and closure workplans in accordance with the requirements of Section 2.2, the Compliance Schedule in Sections 3.0 or 3.1, A.R.S. § 49-252 and A.A.C. R18-9-A209(B)(3).

For facilities to be closed by removal/clean closure: if activities performed in accordance with Groundwater Section approved materials removal workplans or closure plans achieve clean closure immediately based on the closure reports submitted to the Groundwater Section for review and related clean closure applications, then ADEQ shall issue a letter of approval to the permittee. If the closure report contains a schedule for bringing the facility to a clean closure configuration at a future date, and provisions for post-closure activities not already outlined in this permit that are required to achieve closure, then ADEQ may incorporate any part of the schedule as an amendment to this permit.

2.9.2 Closure Completion

Upon completion of closure activities, the permittee shall give written notice to the Groundwater Section indicating the approved closure designs and closure workplans have been fully implemented and provide supporting documentation in closure reports to demonstrate that clean closure has been achieved (soil sample results, verification sampling results, groundwater data, geotechnical data, as applicable), in accordance with the Compliance Schedule in Sections 3.0 or 3.1. If clean closure has been achieved, ADEQ shall issue a letter of approval to the permittee at that time.

For facilities to be closed by removal/clean closure, if any of the following conditions apply, then the permittee shall follow the terms of post-closure specified in Section 2.10:

- Clean closure cannot be achieved at the time of closure notification or within one (1) year thereafter under a diligent schedule of closure actions;
- Further action is necessary to keep the facility in compliance with AWQS at the applicable POC;
- Continued action is required to verify that the closure design has eliminated discharge to the extent intended;
- Remedial or mitigating measures are necessary to achieve compliance with Title 49, Ch. 2; and,
- Further action is necessary to meet property use restrictions.

2.10 Post-Closure [A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9 A209(C)]

This permit has been issued to authorize post-closure activities for regulated facilities, where necessary. If clean closure cannot be achieved in a facility proposed for removal/clean closure,

then the permittee shall submit for approval to the Groundwater Section a post-closure plan that addresses additional post-closure maintenance and monitoring actions at the facility. The post-closure plan shall meet the requirements of A.R.S. § 49-201(30), A.R.S. § 49-252 and A.A.C. R18-9-A209(C). Upon approval of the post-closure plan, this permit shall be amended or a new permit shall be issued to incorporate all post-closure controls and monitoring activities of the post-closure plan and to include interim steps for post-closure in the Compliance Schedule in Sections 3.0, 3.1 or 3.2.

2.10.1 Post-Closure Plan

Post-closure plans shall consist of routine inspections of the BADCT for closed in-place facilities in accordance with Table 4.2-15, and compliance monitoring of POC wells and Alert Well.

If post-closure plans are required for facilities proposed for closure by removal because clean closure conditions could not be achieved, then these plans shall be submitted to the Groundwater Section in accordance with A.A.C. R18-9-A209(C).

2.10.2 Post-Closure Completion

The permittee may at a future time petition that a closed in-place facility qualifies for clean closure. Post closure shall be complete when such clean closure has been demonstrated for a closed in-place facility and is approved by ADEQ.

3.0 COMPLIANCE SCHEDULE ITEMS NOT REQUIRING AMENDMENT [A.R.S. § 49-243(K)(5) and A.A.C. R18-9-A208]

For each compliance schedule item (CSI) listed below, the permittee shall submit the required information, including a cover letter that lists the compliance schedule items, to the Groundwater Section. The following CSIs do not require a permit amendment. A copy of the cover letter must also be submitted to the Water Quality Compliance Section, Data Unit.

No.	Previous CSI No. ³	Task	Summary of Requirements	Due Date	Comments
GROUNDWATER EVALUATION					
1	1	Submit quarterly compliance groundwater contour map	Commence submittal after all new wells are installed. Submit with SMRF or for the same quarter covered by the SMRF. Use new and existing wells to develop the contours. Include contour maps also in interim and final Ambient Groundwater Monitoring Report.	November 2007 and quarterly thereafter	Commenced and ongoing
2	4	Update groundwater assessment and groundwater model every 5 years	Update should address data gaps, adequacy of well locations and screened intervals, and performance of groundwater model; and include groundwater contour maps and other pertinent information in accordance with Section 2.7.4.6.	March 2013 and every 5 years thereafter	In accordance with Section 2.7.4.6
MONITORING WELLS					
POC Wells					
3	NA ⁴	Submit Work Plan	Prepare work plan for the replacement of POC Well MCC-6C	March 2012	
4	NA	Install Replacement POC	Install the replacement POC well, MCC-6C, identified in Section 2.4 of this APP in accordance with ADWR requirements and collect initial groundwater sample.	June 2012	
5	NA	Submit Well Installation Report	Include geologic and well construction logs, initial sampling results, registration number and as-built coordinates for the replacement POC well, MCC-6C, in accordance with Section 2.7.4.4.	September 2012	

³ Previous CSI No. relates renumbered CSIs in this amendment to CSIs in previous versions of the permit.

⁴ NA – Not Applicable

No.	Previous CSI No. ³	Task	Summary of Requirements	Due Date	Comments
6	NA	Initiate ambient monitoring	Sample the replacement POC well, MCC-6C, for 8 consecutive quarters for the parameters listed in Table 4.2-14.	4 th Quarter 2012	
7	NA	Submit Work Plan	Prepare work plan for the replacement of POC Well MCC-9	November 2012	
8	NA	Install Replacement POC	Install the replacement POC well, MCC-9, identified in Section 2.4 of this APP in accordance with ADWR requirements and collect initial groundwater sample.	January 2014	
9	NA	Submit Well Installation Report	Include geologic and well construction logs, initial sampling results, registration number and as-built coordinates for the replacement POC well, MCC-9, in accordance with Section 2.7.4.4.	April 2014	
10	NA	Initiate ambient monitoring	Sample the replacement POC well, MCC-9, for 12 consecutive quarters for the parameters listed in Table 4.2-14.	3 rd Quarter 2014	
11	12	Initiate quarterly compliance monitoring of the Replacement POC wells.	Initiate quarterly compliance sampling of the replacement POC wells after completion of ambient groundwater monitoring for the parameters listed in Tables 4.2-12 and 4.2-13. Following completion of each monitoring event, submit SMRFs in accordance with the requirements of each monitoring table and Section 2.7.1. SMRF due dates are also specified in Section 2.7.6.	4 th Quarter 2014 for Replacement POC MCC-6C and 4 th Quarter 2016 for Replacement POC MCC-9.	
FACILITY CLOSURES					
Settling Ponds 1 and 2					
12	27	Initiate post-closure monitoring for Settling Pond 1	Implement BADCT Performance Standard Inspection and Monitoring in accordance with Table 4.2-15.	March 2014	
Tailings Ponds 6 and 7 and West Outslope of Tailings Pond 5					

No.	Previous CSI No. ³	Task	Summary of Requirements	Due Date	Comments
13	37	Submit final design for closure in place	Base design on characterization results. Coordinate with approved remedial action plan for smelter-affected soils designated for use as mass grading fill; include closure of seepage control for Tailings Pond 6; and include "issued for construction" drawings and specifications and any modifications to the BADCT performance design.	March 2016	Subject to timing of approval of remedial action plan for smelter-affected soils to be used for mass grading fill.
14	39	Initiate post-closure monitoring	Implement BADCT Performance Standard Inspection and Monitoring in accordance with Table 4.2-15.	September 2020	
Stormwater on Tailings Pond 6					
15	48	Submit removal/clean closure workplan for the ponded water	Incorporate pre-removal sampling results.	June 2018	Time extended based on determination whether mine water treatment plant will be capable of treating the stormwater.
BADCT Assessment					
16	50	BADCT Performance Assessment	Submit report documenting the post closure configuration and performance of BADCT. Assess whether upgrades are needed to protect closed in-place facilities. Prepare updated assessment every 5 years, in accordance with Section 2.7.4.7.	February 2012 and 5 years thereafter	
ANNUAL REPORT					
17	52	Submit Annual Report	Submit Annual Report in accordance with Section 2.7.4.1. Annual Report due dates are also specified in Section 2.7.6.	March 2008 and yearly thereafter	Commenced and ongoing in accordance with Sections 2.7.4.1 and 2.7.6

3.1 COMPLIANCE SCHEDULE REQUIRING AMENDMENTS [A.R.S. § 49-243(K)(5) and A.A.C. R18-9-A208]

For each compliance schedule item (CSI) listed below, the permittee shall submit the required information, including a cover letter that lists the compliance schedule items, to the Groundwater Section. The following CSIs are associated with permit amendments. A copy of the cover letter must also be submitted to the Water Quality Compliance Section, Data Unit.

No.	Previous CSI No. ⁵	Task	Summary of Requirements	Due Date	Comments
MONITORING WELLS					
POC Wells					
18	NA ⁶	Submit final Ambient Groundwater Monitoring Report and application for minor amendment for Replacement POC MCC-6C	After receipt of final laboratory data for the twelfth month of ambient monitoring, prepare final report with all data, summary of field methods, summary of laboratory methods, low flow purge data, identification of any quality issues, statistical analysis of the data and proposed ALs and AQLs. Submit request for permit amendment to incorporate proposed ALs and AQLs and to revise well names and well locations as appropriate.	December 2014	
19	NA	Submit final Ambient Groundwater Monitoring Report and application for minor amendment for Replacement POC MCC-9	After receipt of final laboratory data for the twelfth month of ambient monitoring, prepare final report with all data, summary of field methods, summary of laboratory methods, low flow purge data, identification of any quality issues, statistical analysis of the data and proposed ALs and AQLs. Submit request for permit amendment to incorporate proposed ALs and AQLs and to revise well names and well locations as appropriate.	December 2016	
FACILITY CLOSURES					
Settling Ponds 1 and 2					
20	26	Submit closure report for Settling Pond 1 and application for permit amendment	Include as-builts, QA/QC and other information specified in Section 2.7.4.3. Request "other" amendment for post-closure monitoring of the closed facility.	February 2014	Subject to excavation of smelter-affected soils for use as mass grading fill.
Tailings Ponds 6 and 7 and West Outslope of Tailings Pond 5					

⁵ Previous CSI No. relates renumbered CSIs in this amendment to CSIs in previous versions of the permit.

⁶ NA – Not Applicable

No.	Previous CSI No. ⁵	Task	Summary of Requirements	Due Date	Comments
21	38	Submit closure report and application for permit amendment	Include as-builts, QA/QC and other information specified in Section 2.7.4.3. Request "other" amendment for post-closure monitoring of the closed facility.	August 2020	Subject to prior removal of storm-water from the ponds and availability of mine water treatment plant to accommodate the water.
Indian Ponds					
22	47	Submit clean closure completion report and application for permit amendment	Include analytical results for new underlying soils for comparison to minimum, alternative or site-specific GPLs. Submit clean closure application and request for "other" amendment to remove facility from permit.	November 2017	Subject to timing of closure of up-gradient including non-APP facilities and VRP Smelter-affected soils.
Stormwater on Tailings Pond 6					
23	49	Submit clean closure completion report and application for permit amendment.	Submit report documenting volume of water removed and disposition of removed water. Submit clean closure application and request for "other" amendment to remove facility from permit.	August 2019	

3.2 COMPLIANCE SCHEDULE ITEMS COMPLETED [A.R.S. § 49-243(K)(5) and A.A.C. R18-9-A208]

Each of the compliance schedule item (CSI) listed below have been completed and have no further requirements except for continued post-closure monitoring.

No.	Task	Summary of Requirements	Due Date	Comments
GROUNDWATER EVALUATION				
2	Submit groundwater assessment and modeling workplan	Select groundwater model(s) and develop workplan for groundwater modeling in accordance with Section 2.7.4.6.	November 2007	Completed and approved by ADEQ in February 2008.
3	Submit groundwater modeling report	Submit groundwater modeling report that evaluates transit times to wells, duration of post-closure period, buffering capacity of aquifer matrix and other pertinent information in accordance with Section 2.7.4.6.	March 2008	Completed and approved by ADEQ in March 2009.
MONITORING WELLS				
POC Wells				
6	Install new POC wells and Alert Well	Install four new POC wells and one new Alert Well identified in Section 2.4 of this APP in accordance with ADWR requirements and collect initial groundwater sample.	August 2007	Completed; approved by ADEQ on March 30, 2009 for the original POC wells and on January 21, 2010 for the replacement POC and AL wells.
7	Submit Well Installation report(s)	Include geologic and well construction logs, initial sampling results, registration number and as-built coordinates for each well in accordance with Section 2.7.4.4.	November 2007	Completed; approved by ADEQ on March 30, 2009 for the original POC wells and on January 21, 2010 for the replacement POC and AL wells.

No.	Task	Summary of Requirements	Due Date	Comments
8	Initiate ambient monitoring	Sample each new well for 8 consecutive quarters for the parameters listed in Table 4.2-1 for the new POC wells and 4.2-3 for the new Alert Well.	October 2007 and quarterly thereafter; initiated July 2009 for replacement wells	Completed
9	Submit interim Ambient Groundwater Monitoring Report	After receipt of final laboratory data for the fourth quarter of ambient monitoring, prepare interim report with data collected to date, summary of field methods, summary of laboratory methods, low flow purge data and identification of any quality issues.	December 2008; July 2010 for replacement wells	Completed; approved by ADEQ in January 2010 for the December 2008 report. Replacement well report completed; approved by ADEQ in December 2010.
10	Submit final Ambient Groundwater Monitoring Report and application for permit amendment	After receipt of final laboratory data for the eighth quarter of ambient monitoring, prepare final report with all data, summary of field methods, summary of laboratory methods, low flow purge data, identification of any quality issues, statistical analysis of the data and proposed ALs and AQLs. Submit request for permit amendment to incorporate proposed ALs and AQLs and to revise well names and well locations as appropriate.	December 2009, September 2011	Completed
11	Submit contingency plan for Alert Well	Identify corrective action measures that might be taken in addition to those specified in Section 2.6.2.3.2 in the event of an exceedance of an AL in the Alert Well. Submit the plan along with the final Ambient Groundwater Monitoring Report. Include a request for "other" permit amendment to include the additional measures in the APP.	September 2011	Completed

No.	Task	Summary of Requirements	Due Date	Comments
12	Initiate quarterly compliance monitoring of the Replacement POC and Alert Wells and 500 Yard POC well.	Starting the first calendar quarter after the completion of ambient groundwater monitoring, sample the replacement POC and AL wells and 500 Yard POC well for the parameters listed in Tables 4.2-8, 4.2-11, 4.2-13 and 4.2-14. Following completion of each monitoring event, submit SMRFs in accordance with the requirements of each monitoring table and Section 2.7.1. SMRF due dates are also specified in Section 2.7.6.	February 2010 and quarterly thereafter; initiate October 2011 for replacement wells	Commenced and on going
DISCHARGE IMPACT AREA (DIA)				
13	Submit workplan for delineation of DIA	Prepare work plan in accordance with Section 2.7.4, including locations of new off-site monitoring wells (if needed), sampling of existing and new off-site wells, and quality assurance measures.	June 2007	Completed and approved by ADEQ in February 2009.
14	Submit report on the delineation of the DIA	Prepare report in accordance with Section 2.7.4.	February 2009	Completed and approved by ADEQ in May 2011.
FACILITY CLOSURES				
500 Yard Waste Rock Facility				
15	Submit closure report	Include construction quality assurance results and as-builts in accordance with Section 2.7.4.	August 2007	Completed; approved by ADEQ in February 2008.
16	Initiate post-closure monitoring	Implement BADCT Performance Standard Inspection and Monitoring in accordance with Table 4.2-15.	September 2007	Commenced and ongoing in accordance with Section 2.5.2
Tailings Pond 5 (Excluding West Outslope)				
17	Submit final design for closure in place	Include "issued for construction" drawings and specifications and any modifications to BADCT performance design. West outslope is addressed with Tailings Ponds 6 and 7.	May 2007	Completed; approved by ADEQ in December 2008.
18	Submit closure report	Include as-builts, QA/QC and other information specified in Section 2.7.4.3.	October 2008	Completed; approved by ADEQ in February 2011.

No.	Task	Summary of Requirements	Due Date	Comments
19	Initiate post-closure monitoring	Implement BADCT Performance Standard Inspection and Monitoring in accordance with Table 4.2-15.	September 2008	Commenced and ongoing in accordance with Section 2.5.2
Settling Ponds 1 and 2				
20	Submit closure report for Settling Pond 2	Conforming to the 3.02 General Permit for the North Sludge Storage Impoundment built over the Pond.	August 2007	Completed; approved by ADEQ in November 2010.
21	Submit workplan for VOC assessment	Required if VOCs are detected above numeric AWQS in the Alert Well during the ambient monitoring period.	Conditional	Completed; no VOCs detected in the Alert Well during the ambient monitoring period.
22	Submit report of VOC assessment	Required if VOCs are detected above numeric AWQS in the Alert Well during the ambient monitoring period.	Conditional	Completed; no VOCs detected in the Alert Well during the ambient monitoring period.
23	Submit corrective action plan for VOCs	Required if VOCs are detected above numeric AWQS in the Alert Well during the ambient monitoring period.	Conditional	Completed; no VOCs detected in the Alert Well during the ambient monitoring period.
24	Submit conceptual design for in-place closure of Settling Pond 1	Include modification of design proposed in the original APP Closure Application (June 24, 2005).	November 2007	Completed; approved by ADEQ in March 2008. Stability and groundwater demonstrations approved by ADEQ in January 2010.
25	Submit final design for in-place closure of Settling Pond 1	Include "issued for construction" drawings and specifications and any modifications to BADCT performance design.	February 2008	Completed; approved by ADEQ in February 2011.
Smelter Pond				

No.	Task	Summary of Requirements	Due Date	Comments
28	Submit final design for closure in place	Include closure of French drain and two caissons. Include "issued for construction" drawings and specifications and any modifications to BADCT performance design.	February 2008; response with additional information due 3 months after issuance of permit	Completed; approved by ADEQ in February 2011.
29	Submit closure report	Include as-builts, QA/QC and other information specified in Section 2.7.4.3.	November 2008; response with additional information due 3 months after issuance of permit	Completed, approved by ADEQ in February 2011.
30	Initiate post-closure monitoring	Implement BADCT Performance Standard Inspection and Monitoring in accordance with Table 4.2-15.	December 2008	Commenced and ongoing in accordance with Section 2.5.2
Smelter-Affected Soil				
31	Submit Human Health Risk Assessment (HHRA) workplan	Include evaluation of data and a plan to collect additional data necessary to develop alternative or site-specific remediation levels for the soil.	November 2007	Completed. Closure of the Smelter Affected Soils is being performed under the Voluntary Remediation Program (VRP).
32	Submit HHRA Report	Include results of additional data collection and findings of HHRA. Based on findings, propose remediation levels for the soils. To the extent appropriate, take into account risk assumptions employed for cleanup of Northwest Study Area soils. Closure of the Smelter Affected Soils is being performed under the Voluntary Remediation Program.	July 2008	Completed. Closure of the Smelter Affected Soils is being performed under the VRP.
33	Submit Remedial Action Plan (RAP)	Closure of the Smelter Affected Soils is being performed under the Voluntary Remediation Program.	Not Applicable	Closure of the Smelter Affected Soils is being performed under the VRP.

No.	Task	Summary of Requirements	Due Date	Comments
34	Submit remediation completion report	Closure of the Smelter Affected Soils is being performed under the Voluntary Remediation Program.	Not Applicable	Closure of the Smelter Affected Soils is being performed under the VRP.
Tailings Ponds 6 and 7 and West Outslope of Tailings Pond 5				
35	Submit characterization workplan for west outslope of Tailings Pond 5	Characterize materials taken from other facilities during site-wide closure activities and staged on the west outslope for possible use as mass grading fill.	November 2008	Completed; approved by ADEQ in December 2008.
36	Submit characterization report for west outslope of Tailings Pond 5	Report findings of workplan implementation.	October 2010	Completed; approved by ADEQ in May 2011.
Mill Sands Pond				
40	Submit workplan for removal/clean closure.	Base workplan on validation of previous data, characterization within and near footprint, or characterization of mill sands remnants in other locations.	May 2007	Completed; approved by ADEQ in May 2009
41	Submit clean closure completion report	Include analytical results for new underlying soils for comparison to minimum, alternative or site-specific GPLs. Submit clean closure application and request for "other" amendment to remove facility from permit.	February 2008	Submitted February 2008; Completed: issued in September 2011.
Depot Pond				
42	Submit workplan for pre-removal sampling	Rely on pre-removal sampling workplan included in Appendix C, Volume 3, RCML APP Closure Application (June 24, 2005).	N/A	Completed; approved by ADEQ upon issuance of 2007 APP.
43	Submit removal/clean closure workplan	Incorporate pre-removal sampling results. Include unlined ditch leading to pond.	May 2008	Completed; approved by ADEQ in January 2009.
44	Submit clean closure completion report	Include analytical results for new underlying soils for comparison to minimum, alternative or site-specific GPLs. Submit clean closure application and request for "other" amendment to remove facility from permit.	November 2008	Completed; approved by ADEQ in July 2011.
Indian Ponds				

No.	Task	Summary of Requirements	Due Date	Comments
45	Submit workplan for pre-removal sampling	Rely on pre-removal sampling workplan included in Appendix C, Volume 3, RCML APP Closure Application (June 24, 2005)	N/A	Complete; approved by ADEQ upon issuance of 2007 APP.
46	Submit removal/clean closure workplan	Incorporate pre-removal sampling results. Include unlined ditch to the West Indian Pond, seepage control to the West Indian Pond, unlined ditch to the East Indian Pond, and seepage control to the East Indian Pond.	August 2008	Completed; approved by ADEQ in May 2011.
Former WWTP and East Plant Site				
51	Submit WWTP & East Plant Site Determination Report	Include a corresponding clean closure application	May 2007	Clean closure approved by ADEQ on May 13, 2009

4.0 TABLES OF MONITORING REQUIREMENTS

4.1 PRE-OPERATIONAL MONITORING (or CONSTRUCTION REQUIREMENTS)

Not Applicable

4.2 ROUTINE COMPLIANCE MONITORING

Table 4.2 – 1	POC Well MCC-3C Compliance Groundwater Monitoring
Table 4.2 – 2	POC Well MCC-4 Compliance Groundwater Monitoring
Table 4.2 – 3	POC Well MCC-6C Compliance Groundwater Monitoring
Table 4.2 – 4	POC Well MCC-9 Compliance Groundwater Monitoring
Table 4.2 – 5	500 Yard Waste Rock POC Well Compliance Groundwater Monitoring
Table 4.2 – 6	Indian Ponds POC Well Compliance Groundwater Monitoring
Table 4.2 – 7	Smelter Pond POC Well Compliance Groundwater Monitoring
Table 4.2 – 8	Tailings Pond 5 POC-B Well Compliance Groundwater Monitoring
Table 4.2 – 9	GAI-02-01 POC Well Compliance Groundwater Monitoring
Table 4.2 – 10	Settling Ponds 1 and 2 Alert Well-B Compliance Groundwater Monitoring
Table 4.2 – 11	Settling Ponds 1 and 2 Alert Well-B Compliance Groundwater Monitoring (VOCs)
Table 4.2 – 12	Replacement POC Well MCC-6C Compliance Groundwater Monitoring
Table 4.2 – 13	Replacement POC Well MCC-9 Compliance Groundwater Monitoring
Table 4.2 – 14	Ambient Groundwater Monitoring Replacement POC Wells (MCC-6C and MCC-9)
Table 4.2 – 15	BADCT Performance Standard Inspection Monitoring

4.3 CONTINGENCY MONITORING

Table 4.3-1	BADCT Failure - Fluids Contingency Monitoring
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Table 4.2 – 1
POC Well MCC-3C Compliance Groundwater Monitoring

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Antimony	mg/L	0.006	0.0048	Quarterly	Quarterly
Arsenic	mg/L	0.20 ⁷	None	Quarterly	Quarterly
Barium	mg/L	2	1.6	Quarterly	Quarterly
Beryllium	mg/L	0.004	0.0032	Quarterly	Quarterly
Cadmium	mg/L	0.005	0.004	Quarterly	Quarterly
Chromium (total)	mg/L	0.1	0.08	Quarterly	Quarterly
Lead	mg/L	0.05	0.04	Quarterly	Quarterly
Mercury	mg/L	0.002	0.0016	Quarterly	Quarterly
Nickel	mg/L	0.1	0.08	Quarterly	Quarterly
Selenium	mg/L	0.05	0.04	Quarterly	Quarterly
Thallium	mg/L	0.002	0.0016	Quarterly	Quarterly
Fluoride	mg/L	4	3.23	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	10	8	Quarterly	Quarterly
Radiochemistry					
Gross Alpha (including Radium 226) ⁸	pCi/L	15	12	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	5	4	Quarterly	Quarterly
Field Parameters					
pH	S.U	NE ⁹	Monitor Only	Quarterly	Quarterly
Conductivity	µmhos/cm	NE	Monitor Only	Quarterly	Quarterly
Temperature	Degrees F	NE	Monitor Only	Quarterly	Quarterly

⁷ The calculated AL value for this parameter was greater than the AWQS, therefore the AQL has been established at the statistically calculated AL value.

⁸ If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

⁹ Not Established. A numeric AWQS has not been established through rule making to date.

Table 4.2 – 2
POC Well MCC-4 Compliance Groundwater Monitoring

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Antimony	mg/L	0.006	0.0048	Quarterly	Quarterly
Arsenic	mg/L	0.05	0.04	Quarterly	Quarterly
Barium	mg/L	2	1.6	Quarterly	Quarterly
Beryllium	mg/L	0.004	0.0032	Quarterly	Quarterly
Cadmium	mg/L	0.005	0.004	Quarterly	Quarterly
Chromium (total)	mg/L	0.1	0.08	Quarterly	Quarterly
Lead	mg/L	0.05	0.04	Quarterly	Quarterly
Mercury	mg/L	0.002	0.0016	Quarterly	Quarterly
Nickel	mg/L	0.1	0.08	Quarterly	Quarterly
Selenium	mg/L	0.05	0.04	Quarterly	Quarterly
Thallium	mg/L	0.002	0.0016	Quarterly	Quarterly
Fluoride	mg/L	7.76 ¹⁰	None	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	10	8	Quarterly	Quarterly
Radiochemistry					
Gross Alpha (including Radium 226) ¹¹	pCi/L	15	12	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	5	4	Quarterly	Quarterly
Field Parameters					
pH	SU	NE ¹²	Monitor Only	Quarterly	Quarterly
Conductivity	µmhos/cm	NE	Monitor Only	Quarterly	Quarterly
Temperature	Degrees F	NE	Monitor Only	Quarterly	Quarterly

¹⁰ The calculated AL value for this parameter is greater than the AWQS, therefore the AQL has been set at the statistically calculated AL value.

¹¹ If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

¹² NE = Not Established. A numeric AWQS has not been established through rule making to date.

Table 4.2 – 3
POC Well MCC-6C Compliance Groundwater Monitoring

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Antimony	mg/L	0.006	0.0048	Quarterly	Quarterly
Arsenic	mg/L	0.05	0.04	Quarterly	Quarterly
Barium	mg/L	2	1.6	Quarterly	Quarterly
Beryllium	mg/L	0.004	0.0032	Quarterly	Quarterly
Cadmium	mg/L	0.005	0.004	Quarterly	Quarterly
Chromium (total)	mg/L	0.1	0.08	Quarterly	Quarterly
Lead	mg/L	0.05	0.04	Quarterly	Quarterly
Mercury	mg/L	0.002	0.0016	Quarterly	Quarterly
Nickel	mg/L	0.1	0.08	Quarterly	Quarterly
Selenium	mg/L	0.05	0.04	Quarterly	Quarterly
Thallium	mg/L	0.002	0.0016	Quarterly	Quarterly
Fluoride	mg/L	4	3.2	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	10	8	Quarterly	Quarterly
Radiochemistry					
Gross Alpha (including Radium 226) ¹³	pCi/L	15	12	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	5	4	Quarterly	Quarterly
Field Parameters					
pH	S.U	NE ¹⁴	Monitor Only	Quarterly	Quarterly
Conductivity	µmhos/cm	NE	Monitor Only	Quarterly	Quarterly
Temperature	Degrees F	NE	Monitor Only	Quarterly	Quarterly

¹³ If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

¹⁴ NE = Not Established. A numeric AWQS has not been established through rule making to date.

Table 4.2 – 4
POC Well MCC-9 Compliance Groundwater Monitoring

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Antimony	mg/L	0.006	0.0048	Quarterly	Quarterly
Arsenic	mg/L	0.05	0.04	Quarterly	Quarterly
Barium	mg/L	2	1.6	Quarterly	Quarterly
Beryllium	mg/L	0.004	0.0032	Quarterly	Quarterly
Cadmium	mg/L	0.005	0.004	Quarterly	Quarterly
Chromium (total)	mg/L	0.1	0.08	Quarterly	Quarterly
Lead	mg/L	0.05	0.04	Quarterly	Quarterly
Mercury	mg/L	0.002	0.0016	Quarterly	Quarterly
Nickel	mg/L	0.1	0.08	Quarterly	Quarterly
Selenium	mg/L	0.05	0.04	Quarterly	Quarterly
Thallium	mg/L	0.002	0.0016	Quarterly	Quarterly
Fluoride	mg/L	4	3.2	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	10	8	Quarterly	Quarterly
Radiochemistry					
Gross Alpha (including Radium 226) ¹⁵	pCi/L	15	12	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	5	4	Quarterly	Quarterly
Field Parameters					
pH	S.U	NE ¹⁶	Monitor Only	Quarterly	Quarterly
Conductivity	µmhos/cm	NE	Monitor Only	Quarterly	Quarterly
Temperature	Degrees F	NE	Monitor Only	Quarterly	Quarterly

¹⁵ If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

¹⁶ NE = Not Established. A numeric Aquifer Water Quality Standard (AWQS) has not been established through rule making to date.

Table 4.2 – 5
500 Yard Waste Rock POC Well Compliance Groundwater Monitoring

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Common Ions & Miscellaneous Analysis					
Alkalinity	mg/L	NA ¹⁷	Monitor Only	Quarterly	Quarterly
Bicarbonate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Carbonate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Chloride	mg/L	NA	Monitor Only	Quarterly	Quarterly
Fluoride	mg/L	4	3.2	Quarterly	Quarterly
Magnesium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Potassium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Sodium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Calcium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Hardness	mg/L	NA	Monitor Only	Quarterly	Quarterly
Sulfate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Total Dissolved Solids	mg/L	NA	Monitor Only	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	10	Not Applicable ¹⁸	Quarterly	Quarterly
Superior Mine Metals Suite					
Aluminum	mg/L	NA	Monitor Only	Quarterly	Quarterly
Antimony	mg/L	0.006	0.0048	Quarterly	Quarterly
Arsenic	mg/L	0.05	0.04	Quarterly	Quarterly
Barium	mg/L	2	1.6	Quarterly	Quarterly
Beryllium	mg/L	0.004	0.0032	Quarterly	Quarterly
Cadmium	mg/L	0.005	0.004	Quarterly	Quarterly
Chromium (total)	mg/L	0.1	0.08	Quarterly	Quarterly
Copper	mg/L	NA	Monitor Only	Quarterly	Quarterly
Iron	mg/L	NA	Monitor Only	Quarterly	Quarterly
Lead	mg/L	0.05	0.04	Quarterly	Quarterly
Manganese	mg/L	NA	Monitor Only	Quarterly	Quarterly
Molybdenum	mg/L	NA	Monitor Only	Quarterly	Quarterly
Mercury	mg/L	0.002	0.0016	Quarterly	Quarterly
Nickel	mg/L	0.1	0.08	Quarterly	Quarterly
Selenium	mg/L	0.05	0.04	Quarterly	Quarterly
Thallium	mg/L	0.002	0.0016	Quarterly	Quarterly
Zinc	mg/L	NA	Monitor Only	Quarterly	Quarterly
Radiochemistry					
Gross Alpha (including Radium 226) ¹⁹	pCi/L	15	12	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	5	4	Quarterly	Quarterly
Field Parameters					
pH	S.U	NE ²⁰	Monitor Only	Quarterly	Quarterly
Conductivity	µmhos/cm	NE	Monitor Only	Quarterly	Quarterly

¹⁷ NA = A numeric AWQS has not been established for this constituent, therefore an AQL and AL was not established.

¹⁸ Nitrate as nitrogen was detected during the ambient groundwater period with a detection of 10 mg/l. Therefore, the AL was set as Not Applicable.

¹⁹ If the gross alpha particle activity is greater than fifteen 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon

²⁰ NE = Not established, monitor only.

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Temperature	Degrees F	NE	Monitor Only	Quarterly	Quarterly

Table 4.2 – 6
Indian Ponds POC Well²¹ Compliance Groundwater Monitoring

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Common Ions & Miscellaneous Analysis					
Alkalinity	mg/L	NA ²²	Monitor Only	Quarterly	Quarterly
Bicarbonate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Carbonate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Chloride	mg/L	NA	Monitor Only	Quarterly	Quarterly
Fluoride	mg/L	4.0	3.2	Quarterly	Quarterly
Magnesium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Potassium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Sodium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Calcium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Hardness	mg/L	NA	Monitor Only	Quarterly	Quarterly
Sulfate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Total Dissolved Solids	mg/L	NA	Monitor Only	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	10	8.0	Quarterly	Quarterly
Superior Mine Metals Suite					
Aluminum	mg/L	NA	Monitor Only	Quarterly	Quarterly
Antimony	mg/L	0.006	0.0048	Quarterly	Quarterly
Arsenic	mg/L	0.05	0.045	Quarterly	Quarterly
Barium	mg/L	2	1.6	Quarterly	Quarterly
Beryllium	mg/L	0.004	0.0032	Quarterly	Quarterly
Cadmium	mg/L	0.005	0.004	Quarterly	Quarterly
Chromium (total)	mg/L	0.1	0.08	Quarterly	Quarterly
Copper	mg/L	NA	Monitor Only	Quarterly	Quarterly
Iron	mg/L	NA	Monitor Only	Quarterly	Quarterly
Lead	mg/L	0.05	0.04	Quarterly	Quarterly
Manganese	mg/L	NA	Monitor Only	Quarterly	Quarterly
Molybdenum	mg/L	NA	Monitor Only	Quarterly	Quarterly
Mercury	mg/L	0.002	0.0016	Quarterly	Quarterly
Nickel	mg/L	0.1	0.08	Quarterly	Quarterly
Selenium	mg/L	0.05	0.04	Quarterly	Quarterly
Thallium	mg/L	0.002	0.0016	Quarterly	Quarterly
Zinc	mg/L	NA	Monitor Only	Quarterly	Quarterly
Radiochemistry					
Gross Alpha (including Radium 226) ²³	pCi/L	15	12	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	5	4	Quarterly	Quarterly
Field Parameters					

²¹ The Indian Ponds POC well is an alluvial well. During the dry season, water levels will commonly drop below the level of the well screen and water levels will not be measureable. This is acceptable. The well is intended to measure water levels in the alluvium, not in the bedrock. The screened interval is too shallow to have an upper level. Based on construction, it would be impossible to have a surface seal if the screened interval was higher.

²² NA = A numeric AWQS has not been established for this constituent, therefore an AQL and AL was not established.

²³ If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
pH	SU	NE ²⁴	Monitor Only	Quarterly	Quarterly
Conductivity	µmhos/cm	NE	Monitor Only	Quarterly	Quarterly
Temperature	Degrees F	NE	Monitor Only	Quarterly	Quarterly

²⁴ NE = Not established, monitor only.

Table 4.2 – 7
Smelter Pond POC Well Compliance Groundwater Monitoring

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Common Ions & Miscellaneous Analysis					
Alkalinity	mg/L	NA ²⁵	Monitor Only	Quarterly	Quarterly
Bicarbonate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Carbonate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Chloride	mg/L	NA	Monitor Only	Quarterly	Quarterly
Fluoride	mg/L	4.0	3.8	Quarterly	Quarterly
Magnesium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Potassium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Sodium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Calcium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Hardness	mg/L	NA	Monitor Only	Quarterly	Quarterly
Sulfate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Total Dissolved Solids	mg/L	NA	Monitor Only	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	10	8.0	Quarterly	Quarterly
Superior Mine Metals Suite					
Aluminum	mg/L	NA	Monitor Only	Quarterly	Quarterly
Antimony	mg/L	0.006	0.0048	Quarterly	Quarterly
Arsenic	mg/L	0.05	0.04	Quarterly	Quarterly
Barium	mg/L	2	1.6	Quarterly	Quarterly
Beryllium	mg/L	0.004	0.0032	Quarterly	Quarterly
Cadmium	mg/L	0.005	0.004	Quarterly	Quarterly
Chromium (total)	mg/L	0.1	0.08	Quarterly	Quarterly
Copper	mg/L	NA	Monitor Only	Quarterly	Quarterly
Iron	mg/L	NA	Monitor Only	Quarterly	Quarterly
Lead	mg/L	0.05	0.04	Quarterly	Quarterly
Manganese	mg/L	NA	Monitor Only	Quarterly	Quarterly
Molybdenum	mg/L	NA	Monitor Only	Quarterly	Quarterly
Mercury	mg/L	0.002	0.0016	Quarterly	Quarterly
Nickel	mg/L	0.1	0.08	Quarterly	Quarterly
Selenium	mg/L	0.05	0.04	Quarterly	Quarterly
Thallium	mg/L	0.002	0.0016	Quarterly	Quarterly
Zinc	mg/L	NA	Monitor Only	Quarterly	Quarterly
Radiochemistry					
Gross Alpha (including Radium 226) ²⁶	pCi/L	15	12	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	5	4	Quarterly	Quarterly
Field Parameters					
pH	SU	NE ²⁷	Monitor Only	Quarterly	Quarterly
Conductivity	µmhos/cm	NE	Monitor Only	Quarterly	Quarterly
Temperature	Degrees F	NE	Monitor Only	Quarterly	Quarterly

²⁵ NA = A numeric AWQS has not been established for this constituent, therefore an AQL and AL was not established.

²⁶ If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula:

²⁷ NE = Not established, monitor only.

Table 4.2 – 8
Tailings Pond 5 POC Well-B Compliance Groundwater Monitoring

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Common Ions & Miscellaneous Analysis					
Alkalinity	mg/L	NA ²⁸	Monitor Only	Quarterly	Quarterly
Bicarbonate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Carbonate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Chloride	mg/L	NA	Monitor Only	Quarterly	Quarterly
Fluoride	mg/L	4	3.2	Quarterly	Quarterly
Magnesium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Potassium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Sodium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Calcium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Hardness	mg/L	NA	Monitor Only	Quarterly	Quarterly
Sulfate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Total Dissolved Solids	mg/L	NA	Monitor Only	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	10	8	Quarterly	Quarterly
Superior Mine Metals Suite					
Aluminum	mg/L	NA	Monitor Only	Quarterly	Quarterly
Antimony	mg/L	0.006	0.0048	Quarterly	Quarterly
Arsenic	mg/L	0.05	0.04	Quarterly	Quarterly
Barium	mg/L	2	1.6	Quarterly	Quarterly
Beryllium	mg/L	0.004	0.0032	Quarterly	Quarterly
Cadmium	mg/L	0.005	0.004	Quarterly	Quarterly
Chromium (total)	mg/L	0.1	0.08	Quarterly	Quarterly
Copper	mg/L	NA	Monitor Only	Quarterly	Quarterly
Iron	mg/L	NA	Monitor Only	Quarterly	Quarterly
Lead	mg/L	0.05	0.04	Quarterly	Quarterly
Manganese	mg/L	NA	Monitor Only	Quarterly	Quarterly
Molybdenum	mg/L	NA	Monitor Only	Quarterly	Quarterly
Mercury	mg/L	0.002	0.0016	Quarterly	Quarterly
Nickel	mg/L	0.1	0.08	Quarterly	Quarterly
Selenium	mg/L	0.05	0.04	Quarterly	Quarterly
Thallium	mg/L	0.002	0.0016	Quarterly	Quarterly
Zinc	mg/L	NA	Monitor Only	Quarterly	Quarterly
Gross Alpha (including Radium 226) ²⁹	pCi/L	15	12	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	5	4	Quarterly	Quarterly
Field Parameters					
pH	S.U	NE ³⁰	Monitor Only	Quarterly	Quarterly
Conductivity	µmhos/cm	NE	Monitor Only	Quarterly	Quarterly

²⁸ NA = A numeric AWQS has not been established for this constituent, therefore an AQL and AL was not established.

²⁹ If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

³⁰ NE = Not established, monitor only.

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Temperature	Degrees F	NE	Monitor Only	Quarterly	Quarterly

Table 4.2 – 9
Well GAI-02-01 POC Well Compliance Groundwater Monitoring

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Common Ions & Miscellaneous Analysis					
Alkalinity	mg/L	NA ³¹	Monitor Only	Quarterly	Quarterly
Bicarbonate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Carbonate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Chloride	mg/L	NA	Monitor Only	Quarterly	Quarterly
Fluoride	mg/L	4.0	3.2	Quarterly	Quarterly
Magnesium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Potassium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Sodium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Calcium	mg/L	NA	Monitor Only	Quarterly	Quarterly
Hardness	mg/L	NA	Monitor Only	Quarterly	Quarterly
Sulfate	mg/L	NA	Monitor Only	Quarterly	Quarterly
Total Dissolved Solids	mg/L	NA	Monitor Only	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	10	8	Quarterly	Quarterly
Superior Mine Metals Suite					
Aluminum	mg/L	NA	Monitor Only	Quarterly	Quarterly
Antimony	mg/L	0.006	0.0048	Quarterly	Quarterly
Arsenic	mg/L	0.05	0.04	Quarterly	Quarterly
Barium	mg/L	2	1.6	Quarterly	Quarterly
Beryllium	mg/L	0.004	0.0032	Quarterly	Quarterly
Cadmium	mg/L	0.005	0.004	Quarterly	Quarterly
Chromium (total)	mg/L	0.1	0.08	Quarterly	Quarterly
Copper	mg/L	NA	Monitor Only	Quarterly	Quarterly
Iron	mg/L	NA	Monitor Only	Quarterly	Quarterly
Lead	mg/L	0.05	0.04	Quarterly	Quarterly
Manganese	mg/L	NA	Monitor Only	Quarterly	Quarterly
Molybdenum	mg/L	NA	Monitor Only	Quarterly	Quarterly
Mercury	mg/L	0.002	0.0016	Quarterly	Quarterly
Nickel	mg/L	0.1	0.08	Quarterly	Quarterly
Selenium	mg/L	0.05	0.04	Quarterly	Quarterly
Thallium	mg/L	0.002	0.0016	Quarterly	Quarterly
Zinc	mg/L	NA	Monitor Only	Quarterly	Quarterly
Radiochemistry					
Gross Alpha (including Radium 226) ³²	pCi/L	15	12	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	5	4	Quarterly	Quarterly
Field Parameters					
pH	S.U	NE ³³	Monitor Only	Quarterly	Quarterly
Conductivity	µmhos/cm	NE	Monitor Only	Quarterly	Quarterly
Temperature	Degrees F	NE	Monitor Only	Quarterly	Quarterly

³¹ NA = A numeric AWQS has not been established for this constituent, therefore an AQL and AL are not established.

³² If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

³³ NE = Not established, monitor only.

Table 4.2 – 10
Settling Ponds 1 and 2 Alert Well-B Compliance Groundwater Monitoring

Parameter	Units	AL ³⁴	Sampling Frequency	Reporting Frequency
Alkalinity	mg/L	Monitor Only	Quarterly	Quarterly
Bicarbonate	mg/L	Monitor Only	Quarterly	Quarterly
Carbonate	mg/L	Monitor Only	Quarterly	Quarterly
Chloride	mg/L	Monitor Only	Quarterly	Quarterly
Fluoride	mg/L	4	Quarterly	Quarterly
Magnesium	mg/L	Monitor Only	Quarterly	Quarterly
Potassium	mg/L	Monitor Only	Quarterly	Quarterly
Sodium	mg/L	Monitor Only	Quarterly	Quarterly
Calcium	mg/L	Monitor Only	Quarterly	Quarterly
Hardness	mg/L	Monitor Only	Quarterly	Quarterly
Sulfate	mg/L	Monitor Only	Quarterly	Quarterly
Total Dissolved Solids	mg/L	Monitor Only	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	10	Quarterly	Quarterly
Aluminum	mg/L	Monitor Only	Quarterly	Quarterly
Antimony	mg/L	0.006	Quarterly	Quarterly
Arsenic	mg/L	0.05	Quarterly	Quarterly
Barium	mg/L	2	Quarterly	Quarterly
Beryllium	mg/L	0.004	Quarterly	Quarterly
Cadmium	mg/L	0.011 ³⁵	Quarterly	Quarterly
Chromium (total)	mg/L	0.1	Quarterly	Quarterly
Copper	mg/L	Monitor Only	Quarterly	Quarterly
Iron	mg/L	Monitor Only	Quarterly	Quarterly
Lead	mg/L	0.05	Quarterly	Quarterly
Manganese	mg/L	Monitor Only	Quarterly	Quarterly
Molybdenum	mg/L	Monitor Only	Quarterly	Quarterly
Mercury	mg/L	0.002	Quarterly	Quarterly
Nickel	mg/L	0.1	Quarterly	Quarterly
Selenium	mg/L	0.05	Quarterly	Quarterly
Thallium	mg/L	0.002	Quarterly	Quarterly
Zinc	mg/L	Monitor Only	Quarterly	Quarterly
Radiochemistry				
Gross Alpha (including Radium 226) ³⁶	pCi/L	15	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	5	Quarterly	Quarterly
Field Parameters				
pH	SU	Monitor Only	Quarterly	Quarterly
Conductivity	µmhos/cm	Monitor Only	Quarterly	Quarterly
Temperature	Degrees F	Monitor Only	Quarterly	Quarterly

³⁴ The AL is set at the numeric AWQS.

³⁵ The calculated AL value for this parameter is greater than the AWQS, therefore the AL has been set at the statistically calculated value.

³⁶ If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique; EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

Table 4.2 – 11
Settling Ponds 1 and 2 Alert Well-B Compliance Groundwater Monitoring (VOCs)

Parameter	Units	AL	Sampling Frequency	Reporting Frequency
Benzene	mg/L	0.005	Quarterly	Quarterly
Ethylbenzene	mg/L	0.7	Quarterly	Quarterly
Toluene	mg/L	1	Quarterly	Quarterly
Xylenes	mg/L	10	Quarterly	Quarterly
1,2,4-Trimethylbenzene	mg/L	Not Established	Quarterly	Quarterly
2-Methylnaphthalene	mg/L	Not Established	Quarterly	Quarterly
Acenaphthene	mg/L	Not Established	Quarterly	Quarterly
Acenaphthylene	mg/L	Not Established	Quarterly	Quarterly
Anthracene	mg/L	Not Established	Quarterly	Quarterly
Benzo(a)anthracene	mg/L	Not Established	Quarterly	Quarterly
Benzo(a)pyrene	mg/L	0.0002	Quarterly	Quarterly
Benzo(b,k)fluoranthene	mg/L	Not Established	Quarterly	Quarterly
Chrysene	mg/L	Not Established	Quarterly	Quarterly
Dibenzofuran	mg/L	Not Established	Quarterly	Quarterly
Fluoranthene	mg/L	Not Established	Quarterly	Quarterly
Fluorene	mg/L	Not Established	Quarterly	Quarterly
Naphthalene	mg/L	Not Established	Quarterly	Quarterly
Phenanthrene	mg/L	Not Established	Quarterly	Quarterly
Pyrene	mg/L	Not Established	Quarterly	Quarterly

Table 4.2 – 12
Replacement POC Well MCC-6C Compliance Groundwater Monitoring

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Common Ions & Miscellaneous Analysis					
Alkalinity	mg/L	NA ³⁷	Reserved ³⁸	Quarterly	Quarterly
Bicarbonate	mg/L	NA	Reserved	Quarterly	Quarterly
Carbonate	mg/L	NA	Reserved	Quarterly	Quarterly
Chloride	mg/L	NA	Reserved	Quarterly	Quarterly
Fluoride	mg/L	Reserved	Reserved	Quarterly	Quarterly
Magnesium	mg/L	NA	Reserved	Quarterly	Quarterly
Potassium	mg/L	NA	Reserved	Quarterly	Quarterly
Sodium	mg/L	NA	Reserved	Quarterly	Quarterly
Calcium	mg/L	NA	Reserved	Quarterly	Quarterly
Hardness	mg/L	NA	Reserved	Quarterly	Quarterly
Sulfate	mg/L	NA	Reserved	Quarterly	Quarterly
Total Dissolved Solids	mg/L	NA	Reserved	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	Reserved	Reserved	Quarterly	Quarterly
Superior Mine Metals Suite					
Aluminum	mg/L	NA	Reserved	Quarterly	Quarterly
Antimony	mg/L	Reserved	Reserved	Quarterly	Quarterly
Arsenic	mg/L	Reserved	Reserved	Quarterly	Quarterly
Barium	mg/L	Reserved	Reserved	Quarterly	Quarterly
Beryllium	mg/L	Reserved	Reserved	Quarterly	Quarterly
Cadmium	mg/L	Reserved	Reserved	Quarterly	Quarterly
Chromium (total)	mg/L	Reserved	Reserved	Quarterly	Quarterly
Copper	mg/L	NA	Reserved	Quarterly	Quarterly
Iron	mg/L	NA	Reserved	Quarterly	Quarterly
Lead	mg/L	Reserved	Reserved	Quarterly	Quarterly
Manganese	mg/L	NA	Reserved	Quarterly	Quarterly
Molybdenum	mg/L	NA	Reserved	Quarterly	Quarterly
Mercury	mg/L	Reserved	Reserved	Quarterly	Quarterly
Nickel	mg/L	Reserved	Reserved	Quarterly	Quarterly
Selenium	mg/L	Reserved	Reserved	Quarterly	Quarterly
Thallium	mg/L	Reserved	Reserved	Quarterly	Quarterly
Zinc	mg/L	NA	Reserved	Quarterly	Quarterly
Radiochemistry					
Gross Alpha (including Radium 226) ³⁹	pCi/L	Reserved	Reserved	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	Reserved	Reserved	Quarterly	Quarterly
Field Parameters					
pH	SU	NE ⁴⁰	Monitor Only	Quarterly	Quarterly

³⁷ NA = A numeric AWQS has not been established for this constituent, therefore an AQL and AL was not established.

³⁸ Reserved = Reserved to be determined as part of Ambient Groundwater Monitoring in accordance with the Compliance Schedule in Section 3.0 of this permit and Section 2.7.4.

³⁹ If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula:

⁴⁰ NE = Not established, monitor only.

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Conductivity	µmhos/cm	NE	Monitor Only	Quarterly	Quarterly
Temperature	Degrees F	NE	Monitor Only	Quarterly	Quarterly

Table 4.2 – 13
Replacement POC Well MCC-9 Compliance Groundwater Monitoring

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Common Ions & Miscellaneous Analysis					
Alkalinity	mg/L	NA ⁴¹	Reserved ⁴²	Quarterly	Quarterly
Bicarbonate	mg/L	NA	Reserved	Quarterly	Quarterly
Carbonate	mg/L	NA	Reserved	Quarterly	Quarterly
Chloride	mg/L	NA	Reserved	Quarterly	Quarterly
Fluoride	mg/L	Reserved	Reserved	Quarterly	Quarterly
Magnesium	mg/L	NA	Reserved	Quarterly	Quarterly
Potassium	mg/L	NA	Reserved	Quarterly	Quarterly
Sodium	mg/L	NA	Reserved	Quarterly	Quarterly
Calcium	mg/L	NA	Reserved	Quarterly	Quarterly
Hardness	mg/L	NA	Reserved	Quarterly	Quarterly
Sulfate	mg/L	NA	Reserved	Quarterly	Quarterly
Total Dissolved Solids	mg/L	NA	Reserved	Quarterly	Quarterly
Nitrate + Nitrite (as N)	mg/L	Reserved	Reserved	Quarterly	Quarterly
Superior Mine Metals Suite					
Aluminum	mg/L	NA	Reserved	Quarterly	Quarterly
Antimony	mg/L	Reserved	Reserved	Quarterly	Quarterly
Arsenic	mg/L	Reserved	Reserved	Quarterly	Quarterly
Barium	mg/L	Reserved	Reserved	Quarterly	Quarterly
Beryllium	mg/L	Reserved	Reserved	Quarterly	Quarterly
Cadmium	mg/L	Reserved	Reserved	Quarterly	Quarterly
Chromium (total)	mg/L	Reserved	Reserved	Quarterly	Quarterly
Copper	mg/L	NA	Reserved	Quarterly	Quarterly
Iron	mg/L	NA	Reserved	Quarterly	Quarterly
Lead	mg/L	Reserved	Reserved	Quarterly	Quarterly
Manganese	mg/L	NA	Reserved	Quarterly	Quarterly
Molybdenum	mg/L	NA	Reserved	Quarterly	Quarterly
Mercury	mg/L	Reserved	Reserved	Quarterly	Quarterly
Nickel	mg/L	Reserved	Reserved	Quarterly	Quarterly
Selenium	mg/L	Reserved	Reserved	Quarterly	Quarterly
Thallium	mg/L	Reserved	Reserved	Quarterly	Quarterly
Zinc	mg/L	NA	Reserved	Quarterly	Quarterly
Radiochemistry					
Gross Alpha (including Radium 226) ⁴³	pCi/L	Reserved	Reserved	Quarterly	Quarterly
Radium 226 + Radium 228	pCi/L	Reserved	Reserved	Quarterly	Quarterly
Field Parameters					
pH	SU	NE ⁴⁴	Monitor Only	Quarterly	Quarterly

⁴¹ NA = A numeric AWQS has not been established for this constituent, therefore an AQL and AL was not established.

⁴² Reserved = Reserved to be determined as part of Ambient Groundwater Monitoring in accordance with the Compliance Schedule in Section 3.0 of this permit and Section 2.7.4.

⁴³ If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula:

⁴⁴ NE = Not established, monitor only.

Parameter	Units	AQL	AL	Sampling Frequency	Reporting Frequency
Conductivity	µmhos/cm	NE	Monitor Only	Quarterly	Quarterly
Temperature	Degrees F	NE	Monitor Only	Quarterly	Quarterly

Table 4.2 -14
Ambient Groundwater Monitoring Replacement POC Wells
(MCC-6C and MCC-9)

Parameter	Units	AQL	Sampling Frequency	Reporting Frequency
Alkalinity	mg/L	Monitor	Monthly	AGMR ⁴⁵
Bicarbonate	mg/L	Monitor	Monthly	AGMR
Carbonate	mg/L	Monitor	Monthly	AGMR
Chloride	mg/L	Monitor	Monthly	AGMR
Fluoride	mg/L	Monitor	Monthly	AGMR
Magnesium	mg/L	Monitor	Monthly	AGMR
Potassium	mg/L	Monitor	Monthly	AGMR
Sodium	mg/L	Monitor	Monthly	AGMR
Calcium	mg/L	Monitor	Monthly	AGMR
Hardness	mg/L	Monitor	Monthly	AGMR
Sulfate	mg/L	Monitor	Monthly	AGMR
Total Dissolved Solids	mg/L	Monitor	Monthly	AGMR
Nitrate + Nitrite (as N)	mg/L	Monitor	Monthly	AGMR
Aluminum	mg/L	Monitor	Monthly	AGMR
Antimony	mg/L	Monitor	Monthly	AGMR
Arsenic	mg/L	Monitor	Monthly	AGMR
Barium	mg/L	Monitor	Monthly	AGMR
Beryllium	mg/L	Monitor	Monthly	AGMR
Cadmium	mg/L	Monitor	Monthly	AGMR
Chromium (total)	mg/L	Monitor	Monthly	AGMR
Copper	mg/L	Monitor	Monthly	AGMR
Iron	mg/L	Monitor	Monthly	AGMR
Lead	mg/L	Monitor	Monthly	AGMR
Manganese	mg/L	Monitor	Monthly	AGMR
Molybdenum	mg/L	Monitor	Monthly	AGMR
Mercury	mg/L	Monitor	Monthly	AGMR
Nickel	mg/L	Monitor	Monthly	AGMR
Selenium	mg/L	Monitor	Monthly	AGMR
Thallium	mg/L	Monitor	Monthly	AGMR
Zinc	mg/L	Monitor	Monthly	AGMR
Gross Alpha (including Radium 226) ^{46, 47}	pCi/L	Monitor	Monthly	AGMR
Radium 226 + Radium 228 ⁴⁸	pCi/L	Monitor	Monthly	AGMR

⁴⁵ AGMR = Ambient Groundwater Monitoring Report submitted in accordance with Section 2.7.4 and the Compliance Schedule.

⁴⁶ The permittee shall perform ambient monitoring for radionuclides for a minimum of four quarters. If radionuclide concentrations are below the established numeric AWQS during those four quarters, no additional monitoring shall be required and the AQL shall be set at the AWQS and the AL at 80% of the AWQS. If the AWQS is exceeded during any of the four quarterly rounds, then the permittee shall perform a full eight quarters of sampling and propose AQLs and ALs based on statistical assessment of collected data.

⁴⁷ If the gross alpha particle activity is greater than 15 pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique; EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

⁴⁸ The permittee shall perform ambient monitoring for radionuclides for a minimum of four quarters. If radionuclide concentrations are below the established numeric AWQS during those four quarters, no additional monitoring shall be required and the AQL shall be set at the AWQS and the AL at 80% of the AWQS. If the AWQS is exceeded during any of the four quarterly rounds, then the permittee shall perform a full eight quarters of sampling and propose AQLs and ALs based on statistical assessment of collected data.

Parameter	Units	AQL	Sampling Frequency	Reporting Frequency
pH	S.U.	Monitor	Monthly	AGMR
Conductivity	µmhos/cm	Monitor	Monthly	AGMR
Temperature	Degrees F	Monitor	Monthly	AGMR

Table 4.2-15
BADCT Performance Standard Inspection and Monitoring

Parameter	Performance Level	Monitoring/Inspection Frequency	Response Action	Reporting Frequency ⁴⁹
POC Wells and Alert Wells	Well cap in-place and no visible damage to casing	Quarterly as part of groundwater monitoring	Performance Level, Section 2.5.5 of permit	Facility Log Book record keeping Section 2.7.2 for normal inspection, Annual Report for alert level performance exceedances
Closed In-place APP Discharging Facilities Cover Material including Outsoles/Embankments	No visible cracks, deformities, ponding water, settlement, erosion or other damage due to wind, weather, debris, animals or other adverse conditions	Monthly & after a significant storm or other natural disaster, regardless of operating status	Performance Level, Section 2.5.2 of permit	Facility Log Book record keeping Section 2.7.2 for normal inspection and minor repairs, Section 2.7.3 for performance standards relating to structural integrity violation reporting and Annual Report
Each Closed In-Place Facility	No visible evidence of settlement of mass grading fill	Monthly & after a significant storm or other natural disaster, regardless of operating status	Performance Level, Section 2.5.2 of permit or for slope failure Section 2.6.3	Facility Log Book record keeping Section 2.7.2 for normal inspection, Section 2.7.3 for violation reporting and Annual Report
Slope Stability for each Closed In-place Facility	No visible erosion, seeps, cracks, slumps or other adverse conditions	Monthly & after a significant storm or other natural disaster, regardless of operating status.	Performance Level, Section 2.5.2 of permit or for slope failure Section 2.6.3	Facility Log Book record keeping Section 2.7.2 for normal inspections, Section 2.7.3 for slope failure and integrity issue violations reporting and Annual Report

⁴⁹ SMRF (Self Monitoring Report Form) monitoring is not required for this table. Results of inspections shall be recorded in the facility log book and summarized in the Annual Report. Exceeded values shall be reported in accordance with Section 2.7.3.

Parameter	Performance Level	Monitoring/Inspection Frequency	Response Action	Reporting Frequency ⁴⁹
Outslopes/Embankments on each Closed In-Place Facility	No visible evidence of slumping	Monthly & after a significant storm or other natural disaster, regardless of operating status.	Performance Level, Section 2.5.2 of permit or for slope failure Section 2.6.3	Facility Log Book record keeping Section 2.7.2 for normal inspections, Section 2.7.3 for violation reporting and Annual Report
V-Ditch Capacity for each Closed In-place Facility	No overtopping of channels observed.	Annually & after a significant storm or other natural disaster, regardless of operating status.	Performance Level, Section 2.5.2, or for slope failure, Section 2.6.3	Facility Log Book record keeping Section 2.7.2 and Annual Report
V-Ditch Integrity for each Closed In-place Facility	No visible tears, punctures, cracks, deformities, or other damage due to sunlight, wind, weather, deposition, debris, vegetation, animals, or other adverse conditions	Monthly & after a significant storm or other natural disaster, regardless of operating status.	Performance Level, Section 2.5.2 of permit or for liner failure that threatens integrity of BADCT Section 2.6.3	Facility Log Book record keeping Section 2.7.2 for normal inspections, Section 2.7.3 for violation reporting for structural integrity issues and Annual Report
Stormwater Run-on Control Features and Berms Protecting Closed In-place Facilities	Maintained to divert run-on and prevent stormwater from ponding on closed in-place facilities. No visible erosion or other damage that may impact berm integrity or stability	Monthly and after significant storm events	Performance Level, Section 2.5.2	Facility Log Book record keeping Section 2.7.2 for normal inspections, Section 2.7.3 for structural integrity performance standard violation reporting and Annual Report
Each Surface Water Channel and Spillway used for diversion required by BADCT	Drainage network free of obstructions. Inspect for free drainage, no visible damage to lining. Check rip-rap and gabion integrity. Monitor flow rate.	Monthly, and after significant storm event	Performance Level, Section 2.5.2, or for liner failure, Section 2.6.3.	Facility Log Book and record keeping Section 2.7.2 for normal inspections and Annual Report for issues identified and repaired
Apex Tunnel and Apex	Inspect diversion	Monthly and After	Performance	Facility Log Book

Parameter	Performance Level	Monitoring/Inspection Frequency	Response Action	Reporting Frequency ⁴⁹
Berm	channels, berms and tunnel Check integrity.	Significant Storm Events, Annual inspection of Tunnel	Level, Section 2.5.2	record keeping Section 2.7.2 and Annual Report
Revegetation on each Closed In-Place Facility	Vegetation planted in the cover material healthy, established at design density, evidence of new growth.	Annually	Performance Level, Section 2.5.2	Facility Log Book and record keeping Section 2.7.2 for normal inspections, Annual Report for issues identified and corrected
Freeboard in all impoundments until closure configuration results achieved and contain non-contact stormwater only	Maintain at least 2 feet of freeboard from top of berm, except in those impoundments equipped with spillway at a specific elevation that are designed to discharge to the next impoundment down line or to the outfall under a valid AZPDES permit.	Monthly	Performance Level, Section 2.5.2	Facility Log Book and record keeping Section 2.7.2 for normal inspections, Annual Report for issues identified and corrected
Mine Site – General	Stormwater diversion structures required for BADCT design are free of obstructions.	Monthly, and after a significant storm event	Performance Level, Section 2.5.2	Facility Log Book and record keeping Section 2.7.2 for normal inspections, Annual Report for issues identified and corrected

SECTION 4.3 CONTINGENCY MONITORING

Table 4.3-1 BADCT Failure - Fluids Contingency Monitoring

Parameter	UNITS	AWQS	Sampling Frequency	Reporting Frequency
Alkalinity	mg/L	NE ⁵⁰	Within five days of discovery of failure	In accordance with Section 2.7.3 requirements
Bicarbonate	mg/L	NE	"	"
Carbonate	mg/L	NE	"	"
Chloride	mg/L	NE	"	"
Fluoride	mg/L	4	"	"
Magnesium	mg/L	NE	"	"
Potassium	mg/L	NE	"	"
Sodium	mg/L	NE	"	"
Calcium	mg/L	NE	"	"
Hardness	mg/L	NE	"	"
Sulfate	mg/L	NE	"	"
Total Dissolved Solids	mg/L	NE	"	"
Nitrate + Nitrite (as N)	mg/L	10	"	"
Aluminum	mg/L	NE	"	"
Antimony	mg/L	0.006	"	"
Arsenic	mg/L	0.05	"	"
Barium	mg/L	2	"	"
Beryllium	mg/L	0.004	"	"
Cadmium	mg/L	0.005	"	"
Chromium (total)	mg/L	0.1	"	"
Copper	mg/L	NE	"	"
Iron	mg/L	NE	"	"
Lead	mg/L	0.05	"	"
Manganese	mg/L	NE	"	"
Molybdenum	mg/L	NE	"	"
Mercury	mg/L	0.002	"	"
Nickel	mg/L	0.1	"	"
Selenium	mg/L	0.05	"	"
Thallium	mg/L	0.002	"	"
Zinc	mg/L	NE	"	"
Gross Alpha (including Radium 226) ⁵¹	pCi/L	15	"	"
Radium 226 + Radium 228	pCi/L	5	"	"
pH	SU	>6 <9	"	"
Conductivity	µmhos/cm	NE	"	"
Temperature	Degrees F	NE	"	"

⁵⁰ NE – Not Established. A number Aquifer Water Quality Standard (AWQS) has not been established through rule making to date.

⁵¹ If the gross alpha particle activity is greater than fifteen (15) pCi/L, then calculate adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of the uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

5.0 REFERENCES AND PERTINENT INFORMATION

The terms and conditions set forth in this permit have been developed based upon the information contained in the following, which are on file with the Department:

- | | |
|----------------------------------|---|
| 1. Aquifer Protection Permit: | P-101703, LTF Number 36954, February 22, 2007 |
| 2. Engineering Documents: | See public record for technical memoranda, conceptual designs, final designs, workplans and reports submitted in support of application for APP issued February 22, 2007 and submitted subsequently to the issuance of the permit |
| 3. Public Notice dated: | December 20, 2006 |
| 4. Public Hearing dated: | Not Applicable |
| 5. Responsiveness Summary dated: | Not Applicable |
| 6. APP issuance date: | February 22, 2007 |
| 7. Minor APP Amendment: | May 30, 2007 |
| 8. Other APP Amendment: | P-101703, LTF Number 50659, November 5, 2010 |
| 9. Other APP Amendment: | P-101703, LTF Number 52696, October 6, 2011 |
| 10. Other APP Amendment: | P-101703, LTF Number 53570, October 25, 2011 |
| 11. Minor APP Amendment: | P-101703, LTF Number 54904, January 13, 2012 |

6.0 NOTIFICATION PROVISIONS

6.1 Annual Registration Fees

The permittee is notified of the obligation to pay an Annual Registration Fee to ADEQ. The Annual Registration Fee is based upon the amount of daily influent or discharge of pollutants in gallons per day as established by A.R.S. § 49-242.

6.2 Duty to Comply [A.R.S. §§ 49-221 through 49-263]

The permittee is notified of the obligation to comply with all conditions of this permit and all applicable provisions of Title 49, Chapter 2, Articles 1, 2 and 3 of the Arizona Revised Statutes, Title 18, Chapter 9, Articles 1 through 4, and Title 18, Chapter 11, Article 4 of the Arizona Administrative Code. Any permit non-compliance constitutes a violation and is grounds for an enforcement action pursuant to Title 49, Chapter 2, Article 4 or permit amendment, suspension, or revocation.

6.3 Duty to Provide Information [A.R.S. §§ 49-243(K)(2) and 49-243(K)(8)]

The permittee shall furnish to the Director, or an authorized representative, within a time specified, any information which the Director may request to determine whether cause exists for amending or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

6.4 Compliance with Aquifer Water Quality Standards [A.R.S. §§ 49-243(B)(2) and 49-243(B)(3)]

The permittee shall not cause or contribute to a violation of an aquifer water quality standard at the applicable point of compliance for the facility. Where, at the time of issuance of the permit, an aquifer already exceeds an aquifer water quality standard for a pollutant, the permittee shall not discharge that pollutant so as to further degrade, at the applicable point of compliance for the facility, the water quality of any aquifer for that pollutant.

6.5 Technical and Financial Capability

[A.R.S. §§ 49-243(K)(8) and 49-243(N) and A.A.C. R18-9-A202(B) and R18-9-A203(E) and (F)]

The permittee shall have and maintain the technical and financial capability necessary to fully carry out the terms and conditions of this permit. Any bond, insurance policy, trust fund, or other financial assurance mechanism provided as a demonstration of financial capability in the permit application, pursuant to A.A.C. R18-9-A203(D), shall be in effect prior to any discharge authorized by this permit and shall remain in effect for the duration of the permit.

6.6 Reporting of Bankruptcy or Environmental Enforcement [A.A.C. R18-9-A207(C)]

The permittee shall notify the Director within 5 days after the occurrence of any one of the following:

1. The filing of bankruptcy by the permittee.
2. The entry of any order or judgment not issued by the Director against the permittee for the enforcement of any environmental protection statute or rule.

6.7 Monitoring and Records [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A206]

The permittee shall conduct any monitoring activity necessary to assure compliance with this permit, with the applicable water quality standards established pursuant to A.R.S. §§ 49-221 and 49-223 and §§ 49-241 through 49-252.

6.8 Inspection and Entry [A.R.S. §§ 41-1009, 49-203(B) and 49-243(K)(8)]

In accordance with A.R.S. §§ 41-1009 and 49-203(B), the permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to enter and inspect the facility as reasonably necessary to ensure compliance with Title 49, Chapter 2, Article 3 of the Arizona Revised Statutes, and Title 18, Chapter 9, Articles 1 through 4 of the Arizona Administrative Code and the terms and conditions of this permit.

6.9 Duty to Modify [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A211]

The permittee shall apply for and receive a written amendment before deviating from any of the designs or operational practices specified by this permit.

6.10 Permit Action: Amendment, Transfer, Suspension & Revocation

[A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]

This permit may be amended, transferred, renewed, or revoked for cause, under the rules of the Department.

The permittee shall notify the Groundwater Section in writing within 15 days after any change in the owner or operator of the facility. The notification shall state the permit number, the name of the facility, the date of property transfer, and the name, address, and phone number where the new owner or operator can be reached. The operator shall advise the new owner or operators of the terms of this permit and the need for permit transfer in accordance with the rules.

7.0 ADDITIONAL PERMIT CONDITIONS

7.1 Other Information [A.R.S. § 49-243(K)(8)]

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit the correct facts or information.

7.2 Severability

[A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby. The filing of a request by the permittee for a permit action does not stay or suspend the effectiveness of any existing permit condition.

7.3 Permit Transfer

This permit may not be transferred to any other person except after notice to and approval of the transfer by the Department. No transfer shall be approved until the applicant complies with all transfer requirements as specified in A.A.C. R18-9-A212(B) and (C).