ADEQ Arizona Department of Environmental Quality

DRAFT FACT SHEET

ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM (AZPDES)

This document gives pertinent information concerning the reissuance of the AZPDES permit listed below. This facility is a mining operation and is considered to be a major facility under the NPDES program. The discharge limitations contained in this permit will maintain the Water Quality Standards listed in Arizona Administrative Code (A.A.C.) R18-11-101 et. seq. This permit is proposed to be issued for a period of 5 years.

Permittee's Name:	Resolution Copper Mining, LLC (RCML)
Permittee's Mailing Address:	P.O. Box 1944 Superior, A 85173 -1944
Facility Name:	Resolution Copper Mining LLC, Superior Mine
Facility Address or Location:	102 Magma Heights Superior, AZ 85173
Contact Person(s): Phone/e-mail address	Casey McKeon, Environmental Manager 520-689-3254 / Casey.McKeon@riotinto.com
AZPDES Permit Number:	AZ0020389
Inventory Number:	101703

I. STATUS OF PERMIT(s)	
AZPDES permit applied for:	Renewal
Date application received:	**July 9, 2015**
Date application was determined administratively complete:	August 7, 2015
Previous permit number (if different):	None
Previous permit expiration date:	January 9, 2016

RCML has the following permits issued by ADEQ applicable to the Superior Mine:		
Type of Permit	**Permit Number**	**Purpose**
Aquifer Protection Permit (APP)	P-105823 and P-101703	Regulate discharges to the local aquifer
Multi-Sector General Permit (MSGP)	AZMSGP 2010-003	Regulate stormwater discharge
RCRA	AZD001886654	Regulate hazardous waste management
Pinal County Class II Air Permit	B30820 000	Regulate air quality

II. GENERAL FACILITY INFORMATION	
Type of Facility:	Copper Mining Operations
Facility Location Description:	RCML – Superior Mine is located along the northern boundary of the town of Superior in Pinal County, Arizona. Surface facilities are located 0.22 miles north of Queen Creek in two non-contiguous areas identified as the West and East Plant sites. The West Plant site is located immediately northwest of the Town of Superior. The East Plant site is located two miles east of the Town of Superior near the Intersection of Highway 177 and U.S. Highway 60.
County:	Pinal
Average flow per discharge:	No discharge was reported during the 2010 permit term.
Treatment Processes:	The industrial Mine Water Treatment Plant (MWTP) at the facility uses chemical precipitation and a high density sludge process with hydrated lime and soda ash to remove dissolved metals and sand filtration to remove remaining suspended solids. As part of this permit renewal, RCML has requested reevaluation of the TDS limit that required the reverse osmosis (RO) system for post treatment. RCML did not construct the RO plant that was described in the previous factsheet.
Reuse / irrigation or other disposal method(s):	Currently all treated mine water and stormwater are sent to the New Magma Irrigation and Drainage District (NMIDD) for reuse. When irrigation is not an available option, the treated water can be discharged through Outfall 002. Water stored in containment ponds may also be treated by the MWTP and discharged to the NMIDD for reuse or sent to a tailings pond for evaporation.

Facility Information: RCML - Superior Mine has been shut down since 1998. Originally, this site was operated by BHP Copper Inc (BHP) as an underground mine with an onsite smelter. The smelter was shut down in 1971, though mining continued. BHP continued to operate the crusher/concentrator and hauled the concentrate to BHP San Manuel mine until the mine closed in 1998. Active ore mining is not occurring. The original Superior mine contained six stormwater containment ponds. Only the west CP-105 Pond (formerly known as Indian Pond) and Tailings Pond #6 (TP 6) remain for the purpose of mine dewatering and stormwater containment.

There are two permitted outfalls at the facility. Outfall 001 receives mine site stormwater collected from the West Plant site. The stormwater is stored in CP-105 Pond, which has a storage capacity of 68 acre-feet. CP-105 Pond is equipped with pumps capable of pumping 2000 gallons per minute (gpm). The water from CP-105 Pond can be pumped to either the MWTP for treatment or to TP 6 for evaporation. Stormwater containment and seepage pump-back systems are provided at TP 6 and CP-105 Pond. Seepage collected from TP 6 and CP-105 Pond is pumped back to the ponds for evaporation. Discharges resulting from less than a 100-year, 24-hour storm event are prohibited through Outfall 001.

Outfall 002 is for the discharge of treated water from the MWTP. The main source of the water sent to MWTP is from dewatering operations from the underground mine. Small volumes of industrial water and seepage pumping are also sent to MWTP. The mine water is conveyed through a pipeline in the Never Sweat Tunnel to

the MWTP. The MWTP is designed with a high density sludge (HDS) process utilizing hydrated lime and soda ash to remove dissolved metals and sand filters to remove suspended solids. The discharge from the MWTP can be sent to either the NMIDD or to Outfall 002 for discharge to Queen Creek. RCML noted the estimated maximum discharge capacity to Outfall 002 is 3.6 MGD.

III. RECEIVING WATER

The State of Arizona has adopted water quality standards to protect the designated uses of its surface waters. Streams have been divided into segments and designated uses assigned to these segments. The water quality standards vary by designated use depending on the level of protection required to maintain that use.

Receiving Water :	An unnamed wash tributary to Queen Creek (Headwaters to Town of Superior Wastewater Treatment Plant outfall).
River Basin:	Middle Gila River Basin
Outfall Location(s):	Outfall 001: Township 2S, Range 12E, Section 4 Latitude 33º 17' 02" N, Longitude 111º 07' 06" W Outfall 002: Township 2S, Range 12E, Section 4 Latitude 33º 17' 02" N, Longitude 111º 07' 06" W

The outfall discharges to, or the discharge may reach, a surface water listed in Appendix B of A.A.C. Title 18, Chapter 11, Article 1 and referenced in 40 CFR 131.31(b).

Designated uses for the receiving water listed above:	Aquatic and Wildlife warm water (A&Ww) Partial Body Contact (PBC) Fish Consumption (FC) Agricultural Livestock watering (AgL)
Is the receiving water on the 303(d) list?	Yes, the receiving water is listed as impaired for copper (2002), lead (2010) and selenium (2012). The TDML has not yet been completed. The facility is an existing discharger and as such, the AZPDES copper permit limits will be evaluated and incorporated into the TMDL calculations.

Given the uses stated above, the applicable narrative water quality standards are described in A.A.C. R18-11-108, and the applicable numeric water quality standards are listed in A.A.C. R18-11-109 and in Appendix A thereof. There are two standards for the Aquatic and Wildlife uses, acute and chronic. In developing AZPDES permits, the standards for all applicable designated uses are compared and limits that will protect for all applicable designated uses are developed based on the standards.

IV. DESCRIPTION OF DISCHARGE

No discharges have been reported during the 2010 permit term. Testing data of treated water from MWTP are used to represent the discharge from Outfall 002 and also are used for Reasonable Potential (RP) determination. One water sample from CP-105 Pond was collected and tested to represent discharge quality from Outfall 001. The following is the measured discharge quality reported in the application.

Outfall 001

Parameters	Units	Discharge Average	Discharge Maximum
Total Dissolved Solids	mg/L	1600	1600

Total Suspended Solids (TSS)	mg/L	37	37
Sulfate	mg/L	930	930

Outfall 002

Parameters	Units	Discharge Average	Discharge Maximum
Total Dissolved Solids	mg/L	2111	3300
Total Suspended Solids (TSS)	mg/L	<10	10
Sulfate	mg/L	1364	2200

TDS and WET Testing Results for MWTP Effluent (Representative of Outfall 002)

Date of Test	TDS, mg/l	WET, TU_c					WET, IC_{25}		
		Acute Toxicity *P. Promelas*	Acute Toxicity *C. dubia*	Chronic Toxicity *C. dubia*	Chronic Toxicity *P. Promelas*	Chronic Toxicity R. subcapitata	Chronic Toxicity *C. dubia*	Chronic Toxicity *P. Promelas*	Chronic Toxicity R. subcapitata
10/7/2013	2140	pass	pass	1.0	1.0	1.0	< 1.0	< 1.0	< 1.0
4/14/2014	2040	pass	pass	1.0	1.0	1.0	< 1.0	< 1.0	< 1.0
5/19/2014	2100	pass	pass	1.0	1.0	1.0	< 1.0	< 1.0	< 1.0
6/23/2014	2100	pass	pass	1.0	1.0	1.0	< 1.0	< 1.0	< 1.0
7/18/2014	1700	pass	pass	1.0	1.0	1.0	< 1.0	< 1.0	< 1.0
8/18/2014	1500	pass	pass	1.0	1.0	1.0	< 1.0	< 1.0	< 1.0
9/26/2014	1500	pass	pass	1.0	1.0	1.0	< 1.0	< 1.0	< 1.0
1/19/2015	1500	pass	pass	1.0	1.0	1.0	< 1.0	< 1.0	< 1.0
2/23/2015	1900	pass	pass	1.0	1.0	1.0	< 1.0	< 1.0	< 1.0
3/16/2015	1900	pass	pass	1.0	1.0	1.0	< 1.0	< 1.0	< 1.0

V. STATUS OF COMPLIANCE WITH THE EXISTING AZPDES PERMIT

Date of most recent inspection:	05/29/2012; no significant violation was noted as a result of inspection.
DMR files reviewed:	01/2011 through 06/30/2015
Lab reports reviewed:	01/2014 through 04/2015
Exceedances:	Not applicable since no discharge was reported during the 2010 permit term.
NOVs issued:	None
NOVs closed:	N/A
Compliance orders:	None

VI. PROPOSED PERMIT CHANGES			
The following table lists the major changes from the previous permit in this draft permit.			
Parameter	**Existing Permit**	**Proposed permit**	**Reason for change**
Reporting Location	Mail in hard copies of DMRs and other attachments	DMRs and other reports to be submitted electronically through myDEQ portal	Language added to support the NPDES electronic DMR reporting rule that became effective on December 21, 2015.
Metals translator study applied for arsenic, cadmium and copper for Outfall 001 and for copper on Outfall 002.	Metal translator applied and limits adjusted	No metal translator applied	RCML did not request to renew the translator study.
Mercury in Table 1.b	Limited with water quality- based effluent limitation (WQBEL) of 0.01 µg/L	Limit with technology-based effluent limitation (TBEL) of 1.0 µg/L	Data submitted indicated no reasonable potential (RP) for an exceedance of a WQBEL.
Thallium in Table 1.b	Limited	No limit	Data submitted indicated no reasonable potential (RP) for an exceedance of a WQBEL.
Antimony, arsenic and nickel in Table 2.b	Assessment level	No assessment level	Data submitted indicated no reasonable potential (RP) for an exceedance of a WQBEL.
Total dissolved solids (TDS) in Table 1.b	Limited	No limit	New information is available that was not available at the time 2010 permit was issued. Backsliding allowed pursuant to 40 CFR §122.44(l)(2)(i)(B)(1)
Raphidocelis subcapitata (green algae) in Table 1.b	Limited	Action level	Data submitted indicated no reasonable potential (RP) for an exceedance of a WQBEL.

Hydrogen sulfide	No monitoring required	Monitoring required in Tables 2.a and 2.b only if sulfides detected.	New standard in 2009 – replaces standard for sulfides.
Sulfides	No monitoring required	Monitoring required in Tables 2.a and 2.b only as indicator parameter for hydrogen sulfide.	Standard removed in 2009 – replaced with standard for hydrogen sulfide.
Iron	No monitoring required	Limited for Outfall 001 in Table 1.a Limited for Outfall 002 in Table 1.b	2009 standard applied / Data submitted for Outfall 001 and 002 indicated reasonable potential (RP) for an exceedance of a WQBEL.
Total Dissolved Solids (TDS) in Table 2.b	1 x / 6 months	1 x / month	Increased monitoring to characterize the TDS concentration of the discharge.
Conditional WET Monitoring Special Condition	NA	Special Condition added as Part IV(B) of the permit.	To confirm compliance with the narrative toxicity criteria.

Anti-backsliding considerations – "Anti-backsliding" refers to statutory (Section 402(o) of the Clean Water Act) and regulatory (40 CFR 122.44(l)) requirements that prohibit the renewal, reissuance, or modification of an existing NPDES permit that contains discharge limits, permit conditions, or standards that are less stringent than those established in the previous permit. The rules and statutes do identify exceptions to these circumstances where backsliding is acceptable. This permit has been reviewed and drafted with consideration of anti-backsliding concerns.

Limits for the following parameters at outfall 002 have been removed from the permit or in the case of mercury became less stringent because evaluation of current data allows the conclusion that no reasonable potential (RP) for an exceedance of a standard exists:

- *Raphidocelis Subcapitata* - Green Algae
- Thallium
- Mercury

This is considered allowable backsliding under 303(d) (4). The effluent limitations in the current permit for this parameter were based on state standards, the respective receiving waters are in attainment for this parameter, and the revisions are consistent with antidegradation requirements. See Section XI for information regarding antidegradation requirements.

Backsliding of the total dissolved solids limit (TDS) has been considered in this permit. The TDS limit was set in the 2010 permit as a technology-based effluent limit (TBEL) based on best professional judgement (BPJ). The rationale used in setting the limit was based on failures of whole effluent toxicity (WET) tests from a bench-scale study performed on simulated effluent. WET data from simulated effluent was evaluated because effluent from the MWTP was unavailable due to the plant not being operational. The concentration of 1200

mg/L was chosen because that was the concentration threshold where the bench scale effluent WET samples failed.

The MWTP became operational during the permit term. RCML submitted ten WET sample results from actual MWTP effluent. The sample dates ranged from 2013-2015 and the results demonstrated that all three surrogate WET species passed acute and chronic toxicity testing criteria. The subsequent TDS concentrations of the passing samples ranged from 1900 to 2140 mg/L. This data suggest the TDS is not causing toxicity. RCML also submitted TDS influent and effluent data from 2009-2015. The TDS concentration has steadily declined from an estimated average of 6000 mg/L in 2009 to the current average concentration of 2100 mg/L.

TDS is not an Arizona Water Quality Standard (WQS) and there is no promulgated effluent limitation guideline. The backsliding of the TDS limit is allowed pursuant to the exception listed in 40 CFR §122.44(l)(2)(i)(B)(1) that states a less stringent limit can be applied if information is available which was not available at the time of permit issuance and which would have justified the application of a less stringent effluent limit. The Clean Water Act (CWA) section 402(o)(3) provisions on absolute limitation on backsliding has also been reviewed. The review indicates the removal of the TDS limit does not result in a violation of applicable effluent guidelines or an approved Arizona WQS, including antidegradation requirements, because there are no applicable standards to be applied.

Limits are retained in the draft permit for parameters where reasonable potential (RP) for an exceedance of a standard continues to exist, or is indeterminate. In these cases, limits will be recalculated using the most current Arizona WQS. If less stringent limits result due to a change in the WQS then backsliding is allowed in accordance with 303(d)(4) if the new limits are consistent with antidegradation requirements and the receiving water is in attainment of the new standard.

VII. DETERMINATION OF DISCHARGE LIMITATIONS and ASSESSMENT LEVELS

When determining what parameters need monitoring and/or limits included in the draft permit, both technology-based and water quality-based criteria were compared and the more stringent criteria applied.

Technology-based Limitations: As outlined in 40 CFR Part 440:
The discharge from the RCML - Superior Mine qualifies for the limitations under 40 CFR Part 440 Subpart J, Ore Mining and Dressing Point Source Category. Subpart J, the Copper Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory, applies to mines that produce copper, lead, zinc, gold, silver, or molybdenum bearing ores, or any combination of these ores from open-pit or underground operations other than placer deposits.

The following mine drainage limitations are listed in 40 CFR 440.103(a) representing the degree of discharge reduction available for toxic pollutants by the application of the best available technology economically achievable (BAT).

Parameter	30-day Average (mg/L)	Daily Maximum (mg/L)
Cd	0.05	0.10
Cu	0.15	0.30
Hg	0.001	0.002
Pb	0.30	0.6
Zn	0.75	1.5

The following limitation is listed in Section 440.102(a) and represents the degree of discharge reduction attainable by the application of the best practicable control technology currently available (BPT).

Parameter	30-day Average	Daily Maximum
Total Suspended Solids (TSS)	20 mg/L	30 mg/L
pH	Within the range 6.0 standard units (S.U.) to 9.0 standard units	

Any discharge of process water and mine drainage subject to Part 440 Subpart J may qualify for the *Storm exemption for facilities permitted to discharge* as outlined in 40 CFR Part 440.131(b). This storm exemption allows a source, with an allowable discharge under 40 CFR Part 440, to have an overflow as a result of a storm event that does not meet the limitations established in 40 CFR Part 440 if that facility (1) is designed, constructed and maintained to contain the maximum volume of wastewater which would be generated by the facility during a 24-hour period without an increase in volume from precipitation and the maximum volume of wastewater resulting from a 10-year, 24-hour storm event or treat the maximum flow associated with these volumes, (2) has taken all reasonable steps to maintain treatment of the wastewater and minimize the amount of overflow, and (3) provides notification of such discharges. For Outfall 001, the storm exemption is designed to provide an affirmative defense to an enforcement action, and as such, the permittee has the burden of demonstrating to ADEQ and/or EPA that all of the above conditions have been met. The conditions which RCML must meet in order to qualify for the stormwater exemption are listed in the special conditions of the permit. There are no other applicable technology-based effluent limitations for Outfall 001 beyond the prohibition to discharge. The proposed permit includes water quality-based requirements in order to ensure that SWQS are achieved in Queen Creek. For Outfall 002, the parameters with technology-based effluent limitations AND either indeterminate or no reasonable potential based on WQS were assigned the technology-based limits listed in this section.

Numeric Water Quality Standards: As outlined in A.A.C. R18-11-109 and Appendix A:
Per 40 CFR 122.44(d)(1)(ii), (iii) and (iv), discharge limits must be included in the permit for parameters with "reasonable potential" (RP), that is, those known to be or expected to be present in the discharge at a level that could potentially cause any applicable numeric water quality standard to be exceeded. RP refers to the possibility, based on the statistical calculations using the data submitted, or consideration of other factors to determine whether the discharge may exceed the Water Quality Standards. The procedures used to determine RP are outlined in the *Technical Support Document for Water Quality-based Toxics Control (TSD)* (EPA/505/2-90-001). In most cases, the highest reported value for a parameter is multiplied by a factor (determined from the variability of the data and number of samples) to determine a "highest estimated value". This value is then compared to the lowest applicable Water Quality Standard for the receiving water. If the value is greater than the standard, RP exists and a water quality-based effluent limitation (WQBEL) is required in the permit for that parameter. RP may also be determined from BPJ based on knowledge of the treatment facilities and other factors. The basis for the RP determination for each parameter with a WQBEL is shown in the table below.

The proposed permit limits were established using a methodology developed by EPA. Long Term Averages (LTA) were calculated for each designated use and the lowest LTA was used to calculate the average monthly limit (AML) and maximum daily limit (MDL) necessary to protect all uses. This methodology takes into account criteria, discharge variability, and the number of observations taken to determine compliance with the limit and is described in Chapter 5 of the TSD. Limits based on A&W criteria were developed using the "two-value steady state wasteload allocation" described on page 99 of the TSD. When the limit is based on human health criteria, the monthly average was set at the level of the applicable standard and a daily maximum limit was determined as specified in Section 5.4.4 of the TSD.

Mixing Zone: The limits in this permit were determined without the use of a mixing zone. Arizona state water quality rules require that water quality standards be achieved without mixing zones unless the permittee applies for and is approved for a mixing zone. Since a mixing zone was not applied for or granted, all water quality criteria are applied at end-of-pipe.

Assessment Levels (ALs): ALs are listed in Part I.B of the permit. An AL differs from a discharge limit in that an exceedance of an AL is not a permit violation. Instead, ALs serve as triggers, alerting the permitting authority when there is cause for re-evaluation of RP for exceeding a water quality standard, which may result in new permit limitations. The AL numeric values also serve to advise the permittee of the analytical sensitivity needed for meaningful data collection. Trace substance monitoring is required when there is uncertain RP (based on non-detect values or limited datasets) or a need to collect additional data or monitor treatment efficacy on some minimal basis. A reopener clause is included in the draft permit should future monitoring data indicate water quality standards are being exceeded.

The requirement to monitor for these parameters is included in the draft permit according to A.A.C. R18-11-104(C) and Appendix A.

Hardness: The permittee is required to sample hardness as $CaCO_3$ at the same time the trace metals are sampled because the water quality standards for some metals are calculated using the water hardness values. The hardness value of 128 mg/L (the average hardness of the receiving stream as supplied in the application) was used to calculate the applicable water quality standards and any assessment levels or limits for the hardness dependent metals (cadmium, chromium III, copper, lead, nickel, silver and zinc).

Whole Effluent Toxicity (WET): WET testing is required in the draft permit (Parts I.C and III) to evaluate the discharge according to the narrative toxic standard in A.A.C. R18-11-108(A)(5), as well as whether the discharge has RP for WET per 40 CFR 122.44(d)(iv).

WET testing for chronic and/or acute toxicity is required. The requirement to conduct chronic toxicity testing is contingent upon the frequency or duration of discharges. Since completion of the chronic WET test requires a minimum of three samples be taken for renewals, the chronic WET test is not required during any given monitoring period in which the discharge does not occur over seven consecutive calendar days and is not repeated more frequently than every thirty days.

WET testing for chronic / acute toxicity shall be conducted using the following three / two surrogate species:

- *Ceriodaphnia dubia* (water flea) – for evaluating toxicity to invertebrates
- *Pimephales promelas* (fathead minnow) – for evaluating toxicity to vertebrates
- *Pseudokirchneriella subcapitata* (formerly known as *Selenastrum capricornutum or Raphidocelis subcapitata)* (a green alga) – for evaluating toxicity to plant life

ADEQ does not have a numeric standard for Whole Effluent Toxicity. However, ADEQ adopted the EPA recommended chronic toxicity benchmark of 1.0 TUc for a four day exposure period. Using this benchmark, the action levels for WET included in the draft permit were calculated in accordance with the methods specified in the *TSD*. The species chosen for WET testing are as recommended in the *TSD* and in *Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs.*

An exceedance of an action level will trigger follow-up testing to determine if discharge toxicity is persistent. If toxicity above an action level is found in a follow-up test, the permittee will be required to conduct a Toxicity Reduction Evaluation (TRE) and possibly a Toxicity Identification Evaluation (TIE) to identify the source of toxicity and reduce toxicity. These conditions are required to ensure that toxicants are not discharged in amounts that are toxic to organisms [A.A.C. R18-11-108(A)(5)]. A reopener clause is included in accordance with 40 CFR Parts 122 and 124 and AAC R18-9-B906.

The draft permit requires 24-hour composite samples be collected for WET testing. WET sampling must coincide with testing for all the parameters in Parts I.A and B of this permit, when testing of those parameters is required, to aid in the determination of the cause of toxicity if toxicity is detected. Additional procedural requirements for the WET test are included in the proposed permit.

Permit Limitations and Monitoring Requirements:

The table that follows summarizes the parameters that are limited in the permit and the rationale for that decision. Also included are the parameters that require monitoring without any limitations or that have not been included in the permit at all and the basis for those decisions. The corresponding monitoring requirements are shown for each parameter. In general, the regulatory basis for monitoring requirements is per 40 CFR §122.44(i) *Monitoring requirements*, and 40 CFR §122.48(b), *Required monitoring*; all of which have been adopted by reference in A.A.C. R18-9-A905, *AZPDES Program Standards*.

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/ Rationale (1)
Outfall 001						
Flow	- - -	- - -	- - -	- - -	- - -	Discharge flow is to be monitored on a continual basis using a flow meter.
pH	Minimum: 6.5 Maximum: 9.0 A&Ww, AgL and PBC A.A.C. R18-11-109(B)	7.57	1	N/A	WQBEL or TBEL is always applicable	pH is to be monitored using a discrete sample of the discharge and a WQBEL is set. 40 CFR Part 136 specifies that grab samples must be collected for pH. At least one sample must coincide with WET testing to aid in the determination of the cause of toxicity if toxicity is detected.
Total Dissolved Solids (TDS)	No applicable standard	1600 mg/L	1	N/A	N/A	No monitoring is required.
Total Suspended Solids (TSS)	No applicable standard	37 mg/L	1	N/A	N/A	No monitoring is required.
Hardness	No applicable standard. Hardness is used to determine standards for specific metal parameters.	128 mg/L	1	N/A	N/A	A&W standards for cadmium, chromium III, copper, lead, nickel, silver and zinc used for RP determinations were based on the average receiving water hardness value of 128 mg/L. Monitoring for hardness is required whenever monitoring for hardness dependent metals is required.
Antimony	30 µg/L/ A&Ww chronic	6.5 µg/L	1	6.5 µg/L	RP Indeterminate (Insufficient data)	Monitoring is required and an assessment level remains in the permit.
Arsenic	80 µg/L/ FC	53 µg/L	1	53 µg/L	RP Indeterminate (Insufficient data)	Monitoring is required and a WQBEL remains in the permit.
Beryllium	5.3 µg/L/ A&Ww chronic	<1 µg/L	1	<1 µg/L	RP Indeterminate (Insufficient data)	Monitoring is required and an assessment level remains in the permit.
Cadmium (2)	2.69 µg/L/ A&Ww chronic	<1 µg/L	1	<1 µg/L	RP Indeterminate (Insufficient data)	Monitoring is required and a WQBEL remains in the permit.
Chromium (Total)	100 µg/L/ PBC	2.6 µg/L	1	2.6 µg/L	RP Indeterminate (Insufficient data)	Monitoring is required as an indicator parameter for Chromium VI.
Chromium VI	11 µg/L/ A&Ww chronic	No data	1	N/A	RP Indeterminate (Insufficient data)	Monitoring is required and an assessment level remains in the permit.
Copper (2)	11 µg/L/ A&Ww chronic	780 µg/L	1	780 µg/L	RP exists	Monitoring is required and a WQBEL remains in the permit.
Cyanide	9.7 µg/L/ A&Ww chronic	No data	N/A	N/A	N/A	Monitoring is required and an assessment level remains in the permit.
Hydrogen Sulfide	2 µg/L A&Ww chronic	No data	N/A	N/A	N/A	Monitoring is required for sulfides as an indicator parameter for hydrogen sulfide. If sulfides are detected, monitoring for hydrogen sulfide is required for the remainder of the permit term.
Iron	1,000 ug/L / A&Ww chronic	7,000 µg/L	1	92,400 µg/L	RP exists	Monitoring is required and a WQBEL is set in the permit.

Parameter	Lowest Standard / Designated Use		Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/ Rationale (1)
Lead (2)	3.29 µg/L / A&Ww chronic		14 µg/L	1	14 µg/L	RP exists	Monitoring is required and a WQBEL remains in the permit.
Mercury	0.01 µg/L/ A&Ww chronic		<0.2µg/L	1	<0.2 µg/L	RP Indeterminate (Insufficient data)	Monitoring is required and a WQBEL remains in the permit.
Nickel (2)	64 µg/L/ A&Ww chronic		5.5 µg/L	1	5.5 µg/L	RP Indeterminate (Insufficient data)	Monitoring is required and a WQBEL remains in the permit.
Selenium	2 µg/L/ A&Ww chronic		<2 µg/L	1	<2 µg/L	RP Indeterminate (Insufficient data)	Monitoring is required and an assessment level remains in the permit.
Silver (2)	34.9 µg/L/ A&Ww chronic		No data	N/A	N/A	N/A	Monitoring is required and an assessment level remains in the permit.
Sulfides	No applicable standard		No data	N/A	N/A	N/A	Indicator parameter for hydrogen sulfide. Monitoring is required. If sulfides are detected, monitoring for hydrogen sulfide is required for the remainder of the permit term.
Thallium	7.2 µg/L/ FC		<1.0 µg/L	1	<0.1 µg/L	RP Indeterminate (Insufficient data)	Monitoring is required and an assessment level remains in the permit.
Zinc (2)	144 µg/L/ A&Wedw acute and chronic.		420 µg/L	1	420 µg/L	RP exists	Monitoring is required and an assessment level remains in the permit.
Whole Effluent Toxicity (WET)	No toxicity (A.A.C. R18-11-108(A)(6)	*Pseudo-kirchneriella subcapitata (3)*	No data	N/A	N/A	N/A	Monitoring is required and an action level is set.
		Pimephales promelas	No data	N/A	N/A	N/A	Monitoring is required and an action level is set.
		Ceriodaphnia dubia	No data	N/A	N/A	N/A	Monitoring is required and an action level is set.

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/ Rationale (1)
Outfall 002						
Flow	- - -	- - -	- - -	- - -	- - -	Discharge flow is to be monitored on a continual basis using a flow meter.
pH	Minimum: 6.5 Maximum: 9.0 A&Ww, AgL and PBC A.A.C. R18-11-109(B) Minimum: 6.0 Maximum: 9.0 Technology-based limits 40 CFR 440.102(a)	8.3	61	N/A	WQBEL or TBEL is always applicable	pH is to be monitored using a discrete sample of the discharge and a WQBEL is set. 40 CFR Part 136 specifies that grab samples must be collected for pH. At least one sample must coincide with WET testing to aid in the determination of the cause of toxicity if toxicity is detected. pH sampling must also coincide with ammonia sampling when required.
Total Dissolved Solids (TDS)	No applicable standard	3300 mg/L	12	N/A	N/A	Monitoring is required and an assessment level remains in the permit.
Total Suspended Solids (TSS)	Technology Based Effluent Limitations 40 CFR 440.102(a)	<10 mg/L	61	<10 mg/L	N/A	Technology based standard under limitations established in 40 CFR Part 440 Subpart J for copper mines. TBEL is set in the permit.
Hardness	No applicable standard. Hardness is used to determine standards for specific metal parameters.	1474 mg/L	62	N/A	N/A	A&W standards for cadmium, chromium III, copper, lead, nickel, silver and zinc used for RP determinations were based on the average receiving water hardness value of 128 mg/L. Monitoring for hardness is required whenever monitoring for hardness dependent metals is required.
Antimony	30 µg/L/ A&Ww chronic	<2 µg/L	65	4.2 µg/L	No RP	No Monitoring is required.
Arsenic	80 µg/L/ FC	38 µg/L	65	64.6 µg/L	No RP	No Monitoring is required.
Beryllium	5.3 µg/L/ A&Ww chronic	<1 µg/L	64	0.8 µg/L	No RP	No Monitoring is required.
Barium	98,000 µg/L / PBC	39 µg/L	65	50.7 µg/L	No RP	No Monitoring is required.
Boron	186,777 µg/L / PBC	No Data	NA	NA	NA	No monitoring is required. The standard is above what would be expected in the discharge.
Cadmium (2)	2.69 µg/L/ A&Ww chronic 50 ug/L/Technology Based Effluent Limitations 40 CFR 440.103(a)	<1 µg/L	64	0.8 µg/L	No RP	Monitoring is required and a TBEL is set per 40CFR 440.103(a).
Chromium (Total)	100 µg/L/ PBC	3.1 µg/L	65	5.0 µg/L	No RP	Monitoring is required as an indicator parameter for Chromium VI.
Chromium VI	11 µg/L/ A&Ww chronic	No data	N/A	N/A	RP Indeterminate	Monitoring is required and an assessment level remains in the permit.

Parameter	Lowest Standard / Designated Use		Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/ Rationale (1)
Copper (2)	11 µg/L/ A&Ww chronic 150 µg/L//Technology Based Effluent Limitations 40 CFR 440.103(a)		9.8 µg/L	65	17 µg/L	RP Exists	Monitoring is required and a WQBEL remains in the permit.
Cyanide	9.7 µg/L/ A&Ww chronic		No data	N/A	N/A	RP Indeterminate	Monitoring is required and an assessment level remains in the permit.
Hydrogen Sulfide	2 µg/L A&Ww chronic		No data	N/A	N/A	N/A	Monitoring is required for sulfides as an indicator parameter for hydrogen sulfide. If sulfides are detected, monitoring for hydrogen sulfide is required for the remainder of the permit term.
Iron	1,000 ug/L / A&Ww chronic		2300 µg/L	65	3680 µg/L	RP Exists	Monitoring is required and a WQBEL is set in the permit.
Lead (2)	3.29 µg/L / A&Ww chronic		3.3 µg/L	65	5.28 µg/L	RP Exists	Monitoring is required and a WQBEL remains in the permit.
Manganese	130,667 ug/L / PBC		3,200 µg/L	64	5,120 µg/L	No RP	No Monitoring is required
Mercury	0.01 µg/L/ A&Ww chronic 1.00 µg/L Technology Based Effluent Limitations 40 CFR 440.103(a)		0.002 µg/L	36	0.0036 µg/L	No RP	Monitoring is required and a TBEL is set per 40CFR 440.103(a).
Nickel (2)	64 µg/L/ A&Ww chronic		3.7 µg/L	65	5.3 µg/L	No RP	Monitoring is required for discharge characterization.
Selenium	2 µg/L/ A&Ww chronic		<2 µg/L	65	N/A	RP Indeterminate (high LOQ)	Monitoring is required and a WQBEL remains in the permit.
Silver (2)	34.9 µg/L/ A&Ww chronic		No data	N/A	N/A	RP Indeterminate (no data)	Monitoring is required and an assessment level remains in the permit.
Sulfides	No applicable standard		No data	N/A	N/A	N/A	Indicator parameter for hydrogen sulfide. Monitoring is required. If sulfides are detected, monitoring for hydrogen sulfide is required for the remainder of the permit term.
Thallium	7.2 µg/L/ FC		<1.0 µg/L	65	0.8 µg/L	No RP	Monitoring is required for discharge characterization.
Zinc (2)	144 µg/L/ A&Wedw acute and chronic.		180 µg/L	65	288 µg/L	RP Exists	Monitoring is required and a WQBEL is set.
Whole Effluent Toxicity (WET)	No toxicity (A.A.C. R18-11-108(A)(6)	*Pseudo-kirchneriella subcapitata (3)*	1.0 TUc	10	N/A	No RP	Monitoring is required and an action level is set.
		Pimephales promelas	1.0 TUc	10	N/A	No RP	Monitoring is required and an action level is set.
		Ceriodaphnia dubia	1.0 TUc	10	N/A	No RP	Monitoring is required and an action level is set.

Footnotes:

(1) The monitoring frequencies are as specified in the permit.
(2) Hardness-dependent metal - the standard for this parameter is based on the average hardness value of the receiving water as indicated above.
(3) Formerly known as *Selenastrum capricornutum or Raphidocelis subcapitata.*

VIII. NARRATIVE WATER QUALITY STANDARDS

All narrative limitations in A.A.C. R18-11-108 that are applicable to the receiving water are included in Part I, Sections E and F of the draft permit.

IX. MONITORING AND REPORTING REQUIREMENTS (Part II of Permit)

Section 308 of the Clean Water Act and 40 CFR Part 122.44(i) require that monitoring be included in permits to determine compliance with discharge limitations. Additionally, monitoring may be required to gather data for future discharge limitations or to monitor discharge impacts on receiving water quality.

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Monitoring frequencies for some parameters may be reduced in second term permits if all monitoring requirements have been met and the limits or ALs for those parameters have not been exceeded during the first permit term.

For the purposes of this permit, a "24-hour composite" sample has been defined as a flow-proportioned mixture of not less than three discrete samples (aliquots) obtained at equal time intervals over a 24-hour period. The volume of each aliquot shall be directly proportional to the discharge flow rate at the time of sampling.

These criteria for composite sampling are included in order to obtain samples that are representative of the discharge given the potential variability in the duration, frequency and magnitude of discharges from this facility.

Monitoring locations are specified in the permit (Part I.A and Part I.I) in order to ensure that representative samples of the influent and discharge are consistently obtained.

The requirements in the permit pertaining to Part II, Monitoring and Reporting, are included to ensure that the monitoring data submitted under this permit is accurate in accordance with 40 CFR 122.41(e). The permittee has the responsibility to determine that all data collected for purposes of this permit meet the requirements specified in this permit and is collected, analyzed, and properly reported to ADEQ.

The permit (Part II.A.2) requires the permittee to keep a Quality Assurance (QA) manual at the facility, describing sample collection and analysis processes; the required elements of the QA manual are outlined.

Reporting requirements for monitoring results are detailed in Part II, Sections B.1 and 2 of the permit, including completion and submittal of Discharge Monitoring Reports (DMRs) and AZPDES Flow Record forms. The permittee is responsible for conducting all required monitoring and reporting the results to ADEQ on DMRs or as otherwise specified in the permit.

Requirements for retention of monitoring records are detailed in Part II.D of the permit.

Electronic reporting. The US EPA has published a final regulation that requires electronic reporting and sharing of Clean Water Act National Pollutant Discharge Elimination System (NPDES) program information instead of the current paper-based reporting (Federal Register, Vol. 80, No. 204, October 22, 2015). Beginning December 21, 2016 (one year after the effective date of the regulation), the Federal rule requires permittees to make electronic submittals of any monitoring reports and forms called for in their permits. ADEQ has created an online portal called myDEQ that allows users to submit their discharge monitoring reports and other applicable reports required in the permit.

X. SPECIAL CONDITIONS (Part IV in Permit)

Stormwater exception

1. If Outfall 001 has an overflow as a result of precipitation, a discharge shall be allowed if the following conditions are met:
    a. 40 CFR 440.131(b)(1) states the containment pond at the facility must be designed, constructed and maintained to contain the maximum volume of wastewater resulting from a 10-year, 24-hour storm event. The stormwater containment pond at RCML is the CP-105 Pond. RCML has stated the CP-105 Pond is designed, constructed and maintained to contain the volume associated with a 100-year, 24-hour storm event and therefore meets this condition.
    b. RCML takes all reasonable steps to maintain treatment of the wastewater and minimize the amount of overflow. The reasonable steps include, but are not limited to, the following: contain the maximum volume of mine site stormwater generated by a 100 year, 24 hour storm event in CP-105 Pond; pump excess stormwater from CP-105 Pond to Tailings Pond # 6 for extra storage capacity; and/or pump excess stormwater to the MWTP for treatment and discharge to the either the NMIDD or through Outfall 002.
    c. RCML provides notification of such discharges within 30 days to ADEQ at the address listed under Part III.F.3 of this permit. The notification shall contain a report documenting the reasonable steps RCML made to minimize the amount of overflow.

2. The storm exemption is designed to provide an affirmative defense to an enforcement action, and as such, the permittee has the burden of demonstrating to ADEQ and/or EPA that all of the above conditions have been met. The discharge limits in Table 1a. shall be met if a discharge were to occur through Outfall 001.

Conditional WET Monitoring

The permittee submitted ten WET testing results and corresponding TDS concentrations from the MWTP effluent taken over a 17-month period (from 2013 -2015). These WET results passed all acute and chronic toxicity testing criteria. The TDS concentrations of the passing WET tests ranged from 1500 mg/l to 2140 mg/l. As noted, the TDS of the highest passing WET test was 2140 mg/L. If the TDS concentration is greater than 2140 mg/L during monthly monitoring, the permittee shall perform the WET monitoring as required in Table 3b during that month to determine compliance with the toxicity criteria. The permittee shall follow all the WET testing and follow-up testing procedures as described in Part III of the permit. The results from any conditional WET tests as required by this special condition can be used to satisfy the quarterly monitoring if not already reported.

Best Management Practices

The permit requires the permittee to update and continue implementation of the Best Management Practices (BMP) Plan (submitted July 9, 2015 to ADEQ) for RCML – Superior Operations. In addition, Resolution is to submit, on an annual basis (as of the effective date of the permit), a report detailing compliance with the described BMPs and any changes to the BMP Plan.

Ambient Surface Water Monitoring

The regulations under 40 CFR 122.43(a) state that:

"(a) In addition to conditions required in all permits (122.41 and 122.42), the Director shall establish conditions, as required on a case-by-case basis, to provide for and assure compliance with all applicable requirements of CWA and regulations."

The permit requires the permittee to continue monitoring of the receiving water quality and reporting based on the existing requirements. Resolution shall take discrete samples at the specified upstream and downstream ambient monitoring points, QCAMP1 and QCAMP2, located on Queen Creek shortly after flow begins at QCAMP1 downstream through QCAMP2. The parameters to be included in ambient monitoring are arsenic, cadmium, copper, iron, lead, manganese, mercury, selenium, zinc, hardness, field pH, field temperature, field specific conductivity, flow rate, alkalinity, sulfate, and TDS. All ambient metals monitoring results shall be reported as dissolved and total recoverable fractions. All field sampling activities are to be recorded in a hardbound field notebook by the permittee. All ambient monitoring data and lab Quality Control (QC) samples shall be submitted in the annual report.

Receiving Water Bioassessment

The permit requires the permittee to continue an annual bioassessment of Queen Creek. The purpose of the bioassessment is to assess the effectiveness of stormwater and the mine dewatering treatment system pollution control measures implemented by the RCML - Superior Mine. Bioassessments are to be continued at a fixed annual date in April during each year of the permit. Bioassessments are to occur concurrently with required ambient monitoring at the upstream and downstream monitoring points designated in the ambient monitoring plan. The bioassessment for each year shall be submitted as an attachment to the annual report submitted to ADEQ. Bioassessment requirements in this permit may be reopened and modified to reflect changes in Arizona's SWQS regarding biological monitoring of receiving waters or formal adoption by rule of state bioassessment methodologies.

Permit Reopener

This permit may be modified based on newly available information; to add conditions or limits to address demonstrated discharge toxicity; to implement any EPA-approved new Arizona water quality standard; or to re-evaluate reasonable potential (RP), if assessment levels in this permit are exceeded [A.A.C. R18-9-B906 and 40 CFR Part 122.62 (a) and (b)].

XI. ANTIDEGRADATION

Antidegradation rules have been established under A.A.C. R18-11-107 to ensure that existing surface water quality is maintained and protected. The discharge from the RCML - Superior Mine is to an intermittent water where Tier 1 antidegradation protection applies. As long as the permittee maintains consistent compliance with these provisions, the designated uses of the receiving stream will be presumed protected, and the facility will be deemed to meet currently applicable antidegradation requirements under A.A.C. R18-11-107.

XII. STANDARD CONDITIONS

Conditions applicable to all NPDES permits in accordance with 40 CFR, Part 122 are attached as an appendix to this permit.

XIII. ADMINISTRATIVE INFORMATION

Public Notice (A.A.C. R18-9-A907)

The public notice is the vehicle for informing all interested parties and members of the general public of the

contents of a draft AZPDES permit or other significant action with respect to an AZPDES permit or application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit. This permit will be public noticed in a local newspaper after a pre-notice review by the applicant and other affected agencies.

Public Comment Period (A.A.C. R18-9-A908)

Rules require that permits be public noticed in a newspaper of general circulation within the area affected by the facility or activity and provide a minimum of 30 calendar days for interested parties to respond in writing to ADEQ. After the closing of the public comment period, ADEQ is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

Public Hearing (A.A.C R18-9-A908(B))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if the Director determines there is a significant amount of interest expressed during the 30-day public comment period, or if significant new issues arise that were not considered during the permitting process.

EPA Review (A.A.C. R18-9-A908(C))

A copy of this draft permit and any revisions made to this draft as a result of public comments received will be sent to EPA Region 9 for review. If EPA objects to a provision of the draft, ADEQ will not issue the permit until the objection is resolved.

IVX. ADDITIONAL INFORMATION

Additional information relating to this proposed permit may be obtained from:

Arizona Department of Environmental Quality
Water Quality Division – AZPDES Individual Permits Unit
Attn: Swathi Kasanneni
1110 West Washington Street
Phoenix, Arizona 85007

Or by contacting Swathi Kasanneni at (602) 771 – 4577 or by e-mail at sk5@azdeq.gov.

XV. INFORMATION SOURCES

While developing discharge limitations, monitoring requirements, and special conditions for the draft permit, the following information sources were used:

1. AZPDES Permit Application Form(s) 1, 2C & 2F, received July 9, 2015, along with supporting data, facility diagram, and maps submitted by the applicant with the application forms.
2. Supplemental information to the application received by ADEQ on July 28, 2015 and August 7, 2015.
3. ADEQ files on RCML - Superior Mine.
4. ADEQ Geographic Information System (GIS) Web site
5. Arizona Administrative Code (AAC) Title 18, Chapter 11, Article 1, *Water Quality Standards for Surface Waters,* adopted January 31, 2009.
6. A.A.C. Title 18, Chapter 9, Article 9. *Arizona Pollutant Discharge Elimination System* rules.
7. Code of Federal Regulations (CFR) Title 40:
   Part 122, *EPA Administered Permit Programs: The National Pollutant Discharge Elimination System.*

Part 124, *Procedures for Decision Making*.
Part 133. *Secondary Treatment Regulation.*
Part 503. *Standards for the Use or Disposal of Sewage Sludge*.

8. EPA Technical Support Document for Water Quality-based Toxics Control dated March 1991.

9. *Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs*, US EPA, May 31, 1996.

10. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA /821-R-02-013).

11. U.S. EPA NPDES Permit Writers' Manual, September 2010.