

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 effluent 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.

I. PERMITTEE INFORMATION	
Permittee's Name:	Arizona Minerals Inc.
Permittee's Mailing Address:	2210 East Fort Lowell Road Tucson, AZ 85719
Facility Name:	January Mine Hermosa Project
Facility Address or Location:	749 Harshaw Road Patagonia, AZ 85624
County:	Santa Cruz
Contact Person(s): Phone/e-mail address	Brent Musslewhite, Director—Environment and Permitting (520) 485-1300/Brent.Musslewhite@south32.net
AZPDES Permit Number:	AZ0026387
Inventory Number:	512453
LTF Number:	95353

II. STATUS OF PERMIT(S)	
AZPDES permit applied for:	Renewal
Date application received:	July 11, 2022
Date application was determined administratively complete:	July 26, 2022
Previous permit expiration date:	January 7, 2023
<u>208 Consistency:</u>	
In accordance with A.A.C. R18-9-A903(6), a permit cannot be issued for any discharge inconsistent with a plan or plan amendment approved under section 208(b) of the Clean Water Act.	
208 Plan consistency is not required for industrial facilities.	

Arizona Minerals Inc. has the following permits issued by ADEQ applicable to the January Mine Hermosa Project:

Type of Permit

Aquifer Protection Permit (APP)	P-512235	Regulates discharges to the local aquifer
Multi-Sector General Permit (MSGP)	AZMSG-81380	Regulates stormwater discharge

Voluntary Remediation Program:

Arizona Minerals Inc. (AMI) made a number of commitments regarding environmental corrective actions needed on the site to address an ADEQ-issued notice of violation dated October 10, 2014 relating to the previous site owner's Multi-Sector General Stormwater Permit for discharges to waters of the United States. In accordance with the VRP Site Code 505143-02, AMI acquired a Multi-Sector General Stormwater Permit and developed a Stormwater Pollution Prevention Plan (SWPPP) to address and manage stormwater discharges from the Trench Camp Mine Property (January Mine, Norton Mine, and Trench Camp Mine Claims) and developed a Remediation Work Plan that will effectively manage and treat the January Adit Mine Water and seepage from the historic tailing storage facilities.

Originally, AMI's remediation approach involved the construction of a passive treatment system for treatment of the January Adit mine water and historic tailing seepage. In 2016, AMI constructed a small-scale pilot passive treatment system, which operated for 24 weeks and adjusted accordingly, as analytical testing dictate, to ensure the system effectively treated the impacted inflows. Also, during this time AMI worked to improve the stormwater management system through the construction and reconstruction of the site stormwater diversion network to prevent commingling of impacted stormwater with unimpacted stormwater. AMI also implemented measures to ensure January Adit mine water and historic tailings seepage are not discharged into Alum Gulch. It also placed additional soil cover on and reseeded areas of the historic tailings and waste rock where needed to minimize stormwater contact with exposed tailings or waste rock. On October 19, 2016, AMI submitted a Remediation Work Plan to VRP based on a passive treatment system that would effectively treat the impacted water from the January Adit and historic tailings. This Work Plan was public noticed on October 21 and 28, 2016 for 45 days.

On January 24, 2017, AMI notified the VRP that it has decided to pursue an active water treatment system instead of a passive water treatment system. The active water treatment plant combined with placing the historic tailings onto a liner system provides for a more robust remediation Work Plan. The previous 2016 Work Plan did not contemplate placing the historic tailings on a liner system. On April 27, 2017 AMI submitted its Work Plan to VRP, which was public noticed on May 5 and 12, 2017 for 45 days.

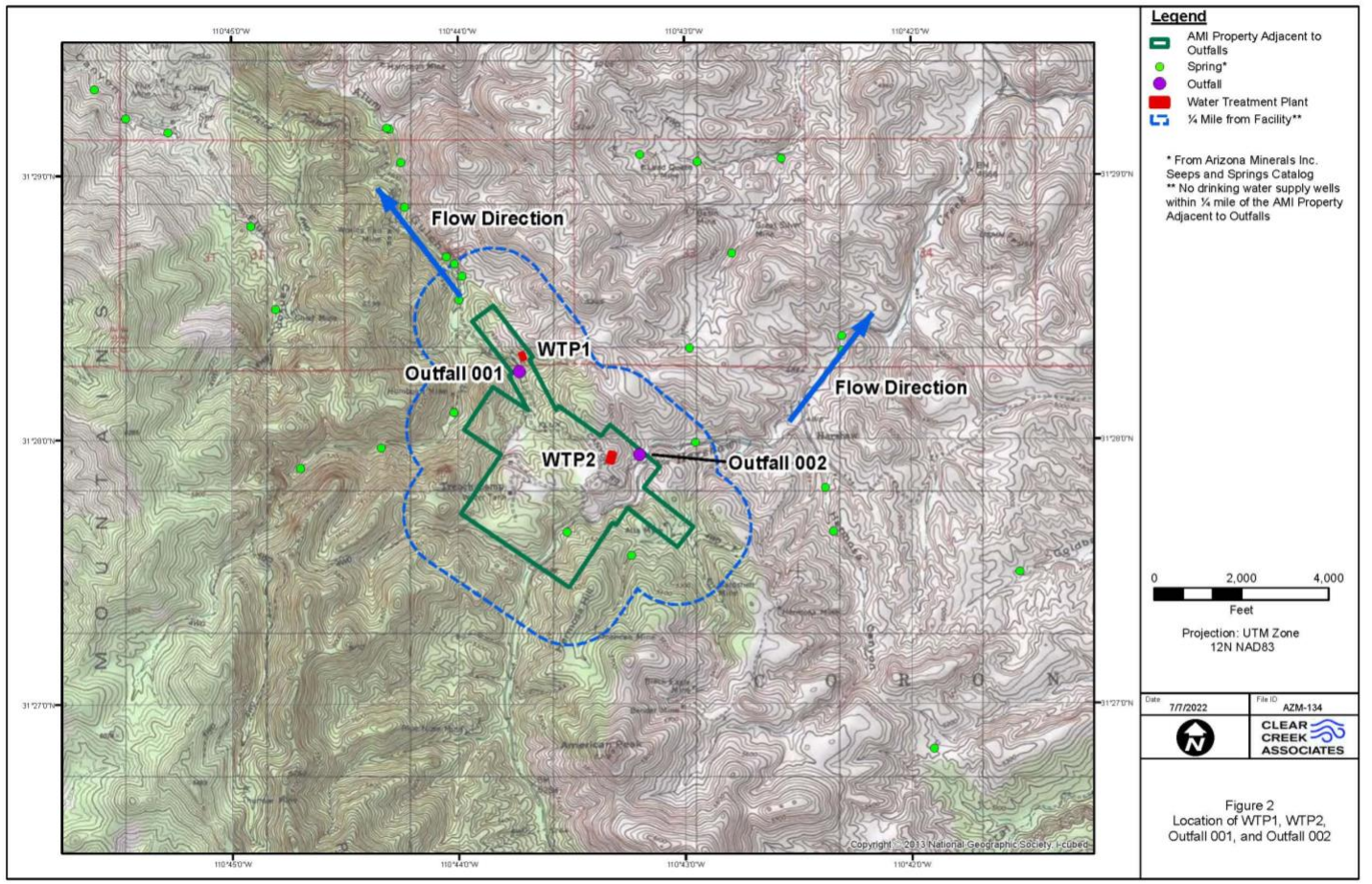
In April 2019, AMI submitted a Work Plan to remove sediment from the historic passive treatment wetland system, which was formerly used to treat mine drainage from January Adit. The Work Plan consisted of sampling clean backfill, building an access road, removing vegetation and former treatment structure, excavation, confirmation sampling, disposal of contaminated sediment, backfilling, and revegetation. The Work Plan was public noticed April 12, 2019 for 45 days.

III. GENERAL FACILITY INFORMATION	
Type of Facility:	Polymetallic mineral deposit mining operation
Facility Location Description:	5 miles south of Patagonia, AZ
Facility Background:	<p>Some of the historical mining operations are on property previously owned by ASARCO LLC (ASARCO). AMI acquired portions of the former ASARCO property and engaged in remediation of historic site activities under ADEQ’s Voluntary Remediation Program (VRP). Activities include capturing and treating mine impacted water from the January Adit, moving historic tailings onto a new lined tailings storage facility, and capturing and treating the water collected in the underdrain collection pond or UDCP (see Voluntary Remediation Program section above).</p> <p>AMI is conducting exploration activities to more fully assess the economic and technical viability of mining the underground polymetallic mineral deposit (primarily targeting zinc, lead, silver and manganese). This will be accomplished largely through advancement of two exploration shafts, which will necessitate dewatering of the local aquifer in the vicinity of the shafts to allow for their safe advancement. The VRP and exploration activities will require the continued use of water treatment plant 1 (WTP1) and the construction and use of water treatment plant 2 (WTP2).</p>
Nature of facility discharge:	<p>Discharge from WTP1 was authorized in the initial 2018 AZPDES permit. WTP1 treats mine drainage water (including water from the January Adit), stormwater runoff and seepage collected from the Tailings Storage Facility (TSF) in the underdrain collection pond (UDCP). To date, WTP1 has not discharged effluent to Alum Gulch; all water has been reused on site. AMI plans to continue to reuse water treated by WTP1 onsite, but 100% reuse onsite may not be possible at all times, particularly after precipitation events that raise water levels in the January Adit and increase the volume of water reporting to the UDCP. If 100% reuse is not possible, effluent from WTP1 may be discharged from Outfall 001 to Alum Gulch or routed to WTP2 after its construction is completed. Since issuance of the 2018 permit, WTP1 was upgraded to provide additional removal of total dissolved solids (TDS), sulfates, and selenium (see Applicable Treatment Processes below).</p> <p>Discharge from WTP2 was authorized in a 2021 amendment to the permit. WTP2 is still under construction at the time of this permit reissuance. WTP2 is designed and will be constructed primarily to treat water from depressurization wells, underground dewatering pumps, and operational water services. Additional inflows of water to WTP2 include water from the underdrain collection pond (UDCP) and January Adit, treated water from WTP1, stormwater, drilling water, and core cutting water (if not used onsite for other purposes).</p>

	<p>Subject to an approved amendment of the facility's APP, the tailings storage facility may in the future receive new dry stack tailings. Any residual moisture contained in those tailings that reports as runoff or seepage to the lined underdrain collection pond may be treated at WTP1 and/or WTP2 and then contribute to the discharge from Outfall 001 or 002. However, discharge of process wastewater (such as discharge directly from a potential new mill to a receiving water) remains prohibited under this permit.</p>
<p>Applicable Treatment Processes:</p>	<p>WTP1:</p> <p>WTP1 uses four steps for treatment. In step 1, suspended solids (metals) are removed through the addition of ferric compounds, flocculant, and sulfide reagents (and with pH adjustment, if required). Ultrafiltration is used to further clarify the solution. In step 2, the sulfate concentration is reduced using nanofiltration (NF) and precipitation (using ferric chloride and lime). In step 3, the selenium is reduced using a selenium electroreduction circuit (ERC) with an iron anode. In step 4, the feed from the ERC is then blended with the NF permeate, resulting in a blended water with reduced sulfate and selenium levels. The treated water can be directed to the moving bed biological reactor (MBBR) to oxidize ammonia (if present). Treated water will be reused on site, discharge from Outfall 001 to Alum Gulch, or routed to WTP2 for further treatment.</p> <p>WTP1 will produce residual solids. The solid residuals will be clarified from solution, filtered (i.e. dewatered by filter press), and deposited at the geomembrane-lined Tailing Storage Facility (TSF), as authorized by the facility's APP.</p> <p>WTP2:</p> <p>WTP2 will use a two-step treatment process. Treatment techniques consist of total suspended solid (TSS) and metal removal circuit sand ballasted clarification, multimedia filtration, thickener, sludge filter press, and fluid management systems. Step 1 treatment removes suspended solids through the addition of ferric compounds, flocculant, and sulfide reagents (and with pH adjustment, if required), and clarification to precipitate metals (including selenium) and separate solids. Step 2 uses ion exchange and electro reduction to remove selenite from the water treated by Step 1. Treated water from Step 2 will be reused on site as needed or piped about 700 feet to the east and discharged through an energy dissipater at Outfall 002. Outfall 002 includes an armored diversion berm to direct flow to Harshaw Creek.</p> <p>WTP2 will produce solid residuals. The solid residuals will be clarified from solution, dewatered by filter press, and deposited at the geomembrane-lined Tailing Storage Facility (TSF), as authorized in the facility's APP.</p>

Average flow per discharge:	No discharge occurred from Outfall 001 or Outfall 002 during the current permit term. WTP1 (Outfall 001) is designed to treat and discharge up to 0.172 million gallons per day (MGD). WTP2 (Outfall 002) is designed to treat and discharge up to 6.48 MGD. The highest flow rate from Outfall 002 is expected to occur in the first years of exploration activities, with flows declining over time.
Continuous or intermittent discharge:	Outfall 001 (Alum Gulch): Intermittent Outfall 002 (Harshaw Creek): Continuous
Discharge pattern summary:	Discharge from Outfall 001 will only occur when AMI is unable to reuse all water treated by WTP1 on-site. Discharge from Outfall 002 is expected to occur on a continuous basis after construction of WTP2 is completed.
<p>The mine was first established before promulgation of the 1982 effluent limitation guidelines applicable to ore mining and dressing, 40 CFR Part 440, Subpart J, and accordingly is not a “new source” as defined in 33 U.S.C. § 1316 (a)(2) and 40 CFR Part 122.2. The mine workings and historic tailings at the site date back to the first half of the 20th century. For this reason, ADEQ is considering the discharge from WTP1 and WTP2 to be an existing source rather than a new source or a new discharger under A.A.C. R18-9-A901.24 or R18-9-A901.25.</p> <p>An AZPDES permit was previously issued for this site to ASARCO (AZ0025054) on December 1, 2003, for discharges of treated mine drainage to Alum Gulch from a constructed wetland treatment system at two locations. The wetland treatment system was unable to achieve the applicable water quality standards, and permit AZ0025054 was not renewed. A new active water treatment facility was constructed by AMI to effectively manage and treat January Adit Mine Water and seepage from the historic tailing storage facilities.</p>	

Map of Facility:



IV. 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 (Federal):	Outfall 001: The Water of the U.S. Protected Surface Water (WOTUS PSW) for the outfall is Alum Gulch (Headwaters to 31°28'20"/110°43'51"). Outfall 002: The Water of the U.S. Protected Surface Water (WOTUS PSW) for the outfall is Harshaw Creek (Headwaters to confluence with Sonoita Creek).
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River Basin:	Santa Cruz River Basin
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<p>Outfall Location(s):</p>	<p>Outfall 001: Township 23 S, Range 16 E, Section 5 Latitude 31° 28' 15" N, Longitude 110° 43' 43" W</p> <p>Outfall 002: Township 23 S, Range 16 E, Section 4 Latitude 31° 27' 57" N, Longitude 110° 43' 12" W</p>
<p>Designated uses for the receiving waters listed above:</p>	<p>Alum Gulch (Outfall 001) and Harshaw Creek (Outfall 002):</p> <ul style="list-style-type: none"> • Aquatic and Wildlife ephemeral (A&We) • Partial Body Contact (PBC) • Agricultural Livestock watering (AgL)
<p>Designated uses for downstream receiving water:</p>	<p>A segment of Alum Gulch (From 31°28'20"/110°43'51" to 31°29'17"/110°44'25") that is 0.17 miles downstream of Outfall 001 has different designated uses than the segment of Alum Gulch where Outfall 001 is located. A Discharge Distance Determination (3D) Analysis was completed to determine the run-out distance of AMI's discharge from WTP1 to Alum Gulch. The 3D Analysis utilized the design capacity of WTP1 (0.172 MGD). Watershed characteristics were obtained from the U.S. Geological Survey StreamStats application. The 3D Analysis determined the discharge from WTP1 had the potential to reach the downstream segment of Alum Gulch with different designated uses. Therefore, the downstream designated uses, which are the most stringent designated uses, are being applied in determining effluent limitations for discharges to Alum Gulch (Outfall 001):</p> <ul style="list-style-type: none"> • Aquatic and Wildlife warm water (A&Ww) • Full Body Contact (FBC) • Fish Consumption (FC) • Agricultural Livestock watering (AgL)
<p>Per A.A.C. R18-11-113(D), the water quality standards that apply to effluent-dependent waters (EDWs) will be applied to derive discharge limitations for any point source discharge of wastewater to an ephemeral water. The AZPDES permit includes discharge limitations and monitoring requirements designed to achieve compliance with A&Wedw standards.</p> <p>Therefore, the following uses are being applied in determining effluent limitations for discharges to Harshaw Creek (Outfall 002):</p> <ul style="list-style-type: none"> • Aquatic and Wildlife effluent dependent water (A&Wedw) • Partial Body Contact (PBC) • Agricultural Livestock watering (AgL) 	
<p>Is the receiving water on the 303(d) list?</p>	<p>Alum Gulch was listed as impaired for cadmium, copper, low pH, and zinc in 1996. A TMDL was completed and approved in June 2003. Alum Gulch was listed as impaired for lead in 2022.</p> <p>This segment of Harshaw Creek is not on the 303(d) list and there are no TMDL issues associated.</p>

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.

V. DESCRIPTION OF DISCHARGE

No discharges have yet occurred from either Outfall 001 or Outfall 002; therefore, effluent monitoring data are not available.

VI. STATUS OF COMPLIANCE WITH THE EXISTING AZPDES PERMIT

This section is not applicable because this is a renewal permit for a facility that has never discharged.

VII. PROPOSED PERMIT CHANGES

The following table lists the major changes from the previous permit in this permit.

Parameter	Existing Permit	Proposed permit	Reason for change
Noncompliance Reporting Hotline	(602) 771-2330.	Noncompliance resulting in imminent threat to human health or the environment must be reported to (602) 771-2330, while all other noncompliance must be reported to (602) 771-1440.	Routing emergency calls to the emergency hotline, but all other calls to a non-emergency number.
Sample type for Chromium VI and Cyanide	8-hour composite.	Discrete.	Parameters are not conducive to composite sampling.
Sampling frequency for Cadmium, Copper, Hardness, Lead, Mercury, Total suspended solids (TSS), and Zinc.	1x/Quarter	1x/Month	Re-assessment of monitoring frequency based on the type of facility, the design capacity, and the type of pollutants being monitored. ADEQ believes monthly sampling for parameters in Tables 1.a. and 1.b. will provide sufficient data to ensure discharge meets surface water quality standards.

<p>Effluent Limitations</p>	<p>Separate acute and chronic limits based on duration of discharge for Outfall 001.</p>	<p>Limits set regardless of duration of discharge from Outfall 001.</p>	<p>Permit limits were developed for acute-only criteria pursuant to A.A.C. R18-11-113(E) for discharges from Outfall 001 that were short-term and infrequent. This provision of the A.A.C. is only applicable to A&Wdw standards. The A&Ww, FBC, FC and AgL designated uses assigned to the non-ephemeral segment of Alum Gulch shortly downstream of Outfall 001 are used to develop permit effluent limits for discharges from Outfall 001. Therefore, ADEQ has chosen to apply chronic criteria to all discharges from Outfall 001, regardless of duration or frequency in this permit renewal.</p>
<p>Use of Metal Translators to Calculate Total Recoverable Permit Limits from Dissolved Criteria (Applicable to Cadmium, Chromium VI, Copper, Lead, Mercury, Nickel, Silver, and Zinc).</p>	<p>No metal translators were used. Assumed the ratio of dissolved to total recoverable is 1 to 1 for all metals with water quality criteria expressed as dissolved.</p>	<p>WQBELs and ALs were converted from dissolved to total recoverable using the default metal translators from the EPA's <i>The Metals Translator: Guidance for Calculating A Total Recoverable Permit Limit from A Dissolved Criterion</i>.</p>	<p>New procedure for ADEQ to incorporate default metal translators when calculating total recoverable WQBELs and ALs from dissolved criteria.</p>
<p>Cadmium</p>	<p>The effluent limitation for Outfall 001 was based on a WQBEL.</p>	<p>The effluent limitation for Outfall 001 is based on the WLA assigned in the TMDL.</p>	<p>Re-evaluation of the 2003 Alum Gulch TMDL. The WQBELs for copper and zinc remain in the permit as they are more stringent than the WLAs from the TMDL.</p>
<p>Mercury and Lead</p>	<p>For Outfall 001, limits were based on TBELs only. For Outfall 002, limits were based on WQBELs.</p>	<p>Limits for Outfall 001 and Outfall 002 are both based on WQBELs.</p>	<p>WQBELs were calculated based on best-professional judgment to protect the designated uses of Alum Gulch. This change is consistent with the 2021 permit modification which incorporated WQBELs into the discharge limitations for Outfall 002.</p>
<p>Assessment Levels (ALs)</p>	<p>Expressed as a single concentration value.</p>	<p>Expressed as a monthly average and daily maximum.</p>	<p>Assessment Levels are calculated using the same method as WQBELs and are expressed as monthly and daily values.</p>

Discharge Characterization Testing	Not required.	Required.	In the event the facility does not discharge during the life of the permit, DC sampling will provide data for ADEQ to analyze potential impacts from the discharges to applicable surface water quality standards.
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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 effluent 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.

No limits have been removed from the permit. Limits are retained in the 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 Water Quality Standards (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; see Section XII for information regarding antidegradation requirements.

No limits are less stringent due to a change in the WQS in this permit.

The following limits are less stringent due to the use of default metal translators for dissolved metals:

- Outfall 001: copper.
- Outfall 002: cadmium, copper, lead, and zinc.

This is considered allowable backsliding in accordance with 303(d)(4). Harshaw Creek (Outfall 002) is in attainment of the WQS for these parameters and the new limits are consistent with antidegradation requirements. While Alum Gulch is not in attainment of the WQS for these parameters, the new limits are more stringent than the requirements of the TMDL; therefore, the cumulative effects of the new permit limits and the TMDL assures the attainment of the WQS.

VIII. DETERMINATION OF EFFLUENT LIMITATIONS and ASSESSMENT LEVELS

When determining what parameters need monitoring and/or limits included in the 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 regulations found at 40 CFR, Part 440, Subpart J require that mines that produce copper, lead, zinc, gold, silver, or molybdenum bearing ores, or any combination of these ores from open-pit or underground operations achieve specified treatment standards for Total Suspended Solids (TSS), pH, cadmium, copper, lead, mercury, and zinc based on the type of treatment technology available. These parameters will be monitored with technology-based effluent limitations (TBELs) as applicable at the outfall. These provisions have been applied based on Best Practicable Control Technology (BPT) currently available and Best Available Technology (BAT) economically achievable.

40 CFR 440.103(a) establishes discharge limitations applicable to mine drainage. The following limitations represent the degree of discharge reduction attainable by the application of the best available technology economically achievable (BAT):

Parameter 30-day Average (mg/L) Daily Maximum (mg/L)

Cadmium	0.05	0.10
Copper	0.15	0.30
Mercury	0.001	0.002
Lead	0.3	0.6
Zinc	0.75	1.5

40 CFR 440.102(a) establishes the following limitation that represents the degree of discharge reduction attainable for mine drainage by the application of the best practicable control technology currently available (BPT):

<u>Parameter</u>	<u>30-day Average</u>	<u>Daily Maximum</u>
Total suspended solids (TSS)	20 mg/L	30 mg/L
pH	Within the range of 6.0 to 9.0	Within the range of 6.0 to 9.0

There are no other applicable technology-based effluent limitations for Outfall 001 and Outfall 002 beyond the limitations on the discharge of process wastewater as specified in 40 CFR 440.102(c), 40 CFR 440.102(d), 40 CFR 440.103(c), and 40 CFR 440.103(d).

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 effluent at a level that could potentially cause any applicable numeric water quality standard to be exceeded. RP refers to an analysis, 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.

No discharges have occurred from either Outfall 001 or Outfall 002, effluent (discharge) data are not yet available; however, the Permittee has characterized the influent and treatment processes at WTP1 and WTP2 to show that numeric water quality standards will be met. The water quality for effluent from WTP1 and WTP2 are characterized by examination of the influent to each WTP, the performance of similar treatment plants, and the results of treatability studies for WTP1 and WTP2. Based on this knowledge, RP is determined from BPJ and WQBELs were established for cadmium, copper, lead, mercury, and zinc. RP could not be calculated for other potential pollutants that are subject to numeric water quality standards. Instead of WQBELs, assessment levels (ALs) were established for Trace Substances (Table 2.a and 2.b in the permit). ALs and relatively frequent monitoring are necessary for these parameters because they are commonly present in effluents at variable concentrations and at a level that could exceed the applicable water quality criteria for them. (See discussion under “Assessment Levels” below for further details.) For a number of other pollutants, Discharge Characterization (DC) monitoring is required at a lesser frequency and without established ALs or numeric limits (Table 4. in the permit). (See discussion under “Discharge Characterization” below for further details.)

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, effluent

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.

TMDL:

The 2003 Alum Gulch TMDL established chronic waste load allocations (WLAs) for cadmium, copper, zinc, and pH for the January Adit at a baseflow discharge of 0.04 cfs (only passive seepage from January Adit was considered during development of the 2003 TMDL). The WLAs are as follows:

Parameter	Waste Load Allocation (kg/day)
Cadmium (total)	0.0039
Copper (total)	0.011
Zinc (total)	2
H+ (pH)	0.00000025

To calculate total-recoverable permit limits, the WLA must be converted to a concentration value. The concentration value is determined as follows:

$$WLA_{conc} = \frac{WLA_{mass}}{Q \times 3.785 \times 1,000}$$

Where:

WLA_{conc} = the concentration-based waste load allocation with units of $\mu\text{g/L}$

WLA_{mass} = the mass-based waste load allocation from the above table with units of kg/day

Q = flow, 0.172 MGD

3.785 is a conversion factor with units of L/gal

1,000 is a conversion factor with units of mg/ μg

The concentration values for the WLA are as follows:

Parameter	Concentration-based WLA ($\mu\text{g/L}$)
Cadmium (total)	6.0
Copper (total)	32
Zinc (total)	3,100
H+	0.000038

A Long-Term Average (LTA) was calculated for the WLA cadmium, copper, and zinc. The LTA was used to calculate the average monthly limit (AML) and maximum daily limit (MDL) as per the method described in the Numeric Water Quality Standards section above. These limitations are compared to the WQBELs and the most stringent limit is incorporated into the permit (see table below, the most stringent limits are bolded). Therefore, the effluent limitation for cadmium will be based on the WLA from the TMDL. The effluent limitations for copper and zinc will be based on the WQBELs, as they are more stringent than the requirements of the TMDL.

Parameter	Average Monthly Limit (µg/L) based on TMDL	Maximum Daily Limit (µg/L) based on TMDL	Average Monthly Limit (µg/L) based on WQBEL	Maximum Daily Limit (µg/L) based on WQBEL
Cadmium (total)	4.9	9.8	5.99	12.0
Copper (total)	26	53	25	50
Zinc (total)	2,500	5,000	193	388

The pH value is calculated from the WLA as follows:

$$pH = -\log [H^+]$$

Where H+ is the concentration in moles. Since the atomic weight of hydrogen is one, 1 mole equates very closely to 1 mg/L. Using the WLA in mg/L (0.000000038 mg/L H+), the resulting pH is 7.4. Unlike other parameters where more stringent is inherently more protective, pH requirements should be evaluated based on environmental impact. Requiring a slightly basic discharge may be harmful to the ecosystem of Alum Gulch. The pH measurement from OOPATW-17, considered a natural background site, was 5.8 S.U., suggesting the pH of Alum Gulch may be naturally low. Therefore, the WQBEL for pH (6.5-9.0 S.U.) remains in the permit and ensures the discharge for WTP1 meets WQS.

Mixing Zone

Arizona water quality rules require that water quality standards be achieved without mixing zones unless the permittee applies and is approved for a mixing zone. Since the receiving stream for this discharge is ephemeral prior to the discharge, no water is available for a mixing zone and all water quality criteria are applied at end-of pipe. This means that the effluent concentration must meet stream standards.

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 permit should future monitoring data indicate water quality standards are being exceeded.

The requirement to monitor for these parameters is included in the permit according to A.A.C. R18-11-104(C) and Appendix A. ALs listed for each parameter were calculated in the same manner that a limit would have been calculated (see Numeric Water Quality Standards Section above).

Hardness

The permittee is required to sample hardness as CaCO₃ 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 of the influent that will be treated by WTP1 is very high (estimated influent concentrations provided in the application are 610-2000 mg/L). Therefore, a hardness value of 400 mg/L (the maximum allowable hardness value that can be used to calculate standards, per Title 18, Chapter 11, Article 1, Appendix B, footnote d(ii)) was used to calculate the applicable water quality standards and any assessment levels or limits for the hardness dependent metals (cadmium, copper, lead, nickel, silver and zinc) for Outfall 001 (Alum Gulch).

The hardness of the influent that will be treated by WTP2 is estimated to range from 258-340 mg/L. Therefore, a hardness value of 258 mg/L (the lower range of the estimated WTP2 influent hardness) was used to calculate the applicable water quality standards and any assessment levels or limits for the hardness dependent metals (cadmium, copper, lead, nickel, silver and zinc) for Outfall 002 (Harshaw Creek).

Whole Effluent Toxicity (WET)

WET testing is required in the 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 toxicity shall be conducted using the following three 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 Toxic Unit-Chronic (TUC) for a four-day exposure period. Using this benchmark, the limitations and/or action levels for WET included in the 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 a limit or action level will trigger follow-up testing to determine if effluent toxicity is persistent. If toxicity above a limit or 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 permit requires 8-hour composite samples be collected for WET testing. An 8-hour composite sample type was chosen over the suggested 24-hour composite for WET testing in order to have consistency with the type of sample required for other parameters requiring monitoring in this permit. WET sampling must coincide with testing for all the parameters in Parts I.A and B of the 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.

The required WET monitoring frequency for this facility is consistent with the WET testing frequency required for facilities with a similar design flow. The permit requires WET test results to be reported on discharge monitoring reports and submittal of the full WET lab report to ADEQ.

Discharge characterization (DC)

In addition to monitoring for parameters assigned either a limit or an AL, sampling is required to assess the presence of pollutants in the discharge at certain minimum frequencies for additional suites of parameters, whether the facility is discharging or not. This monitoring is specified in Table 4. Discharge Characterization Testing—General Chemistry, Selected Metals, Trace Substances, and WET.

NOTE: Some parameters listed in Table 4. are also listed in Tables 1.a., 1.b., 2.a., or 2.b. In this case, the data from monitoring under Tables 1.a., 1.b., 2.a., or 2.b. may be used to satisfy the requirements of Table 4., provided the specified sample types are the same. In the event the facility does not discharge to a Protected Surface Water during the life of the permit, DC monitoring of representative samples of the effluent is still required.

The purpose of DC monitoring is to characterize the effluent and determine if the parameters of concern are present in the discharge and at what levels. This monitoring will be used to assess RP per 40 CFR 122.44(d)(1)(iii)). DC monitoring is required in accordance with 40 CFR 122.43(a), 40 CFR 122.44(i), and 40 CFR 122.48(b) as well as A.R.S. §49-203(A)(7). If pollutants are noted at levels of concern during the permit term, this permit may also be reopened to add related limits or conditions.

Permit Limitations and Monitoring Requirements

Tables 1 and 2 of the fact sheet summarize 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*.

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Table 1. Permit limitations and monitoring requirements for Outfall 001 (Alum Gulch).

Parameter	Lowest Standard/Designated Use	Maximum Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/Rationale (1)
Flow	---	---	---	---	---	Discharge flow is to be monitored on a continual basis using a flow meter.
pH (2)	Minimum: 6.5 Maximum: 9.0 A&Ww and FBC A.A.C. R18-11-109(B) Minimum: 6.0 Maximum: 9.0 Technology-based limits 40 CFR 440.102	No Data	0	N/A	WQBEL or TBEL is always applicable.	pH is to be monitored using a discrete sample of the effluent 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.
Temperature	R18-11-109C the discharge shall not cause an increase in the ambient water temperature. A&Ww: no more than 3.0°C	No Data	0	N/A	N/A	Discharge temperature is to be monitored for discharge characterization by discrete sample. 40 CFR Part 136 specifies that discrete samples must be collected for temperature. Temperature sampling must also coincide with ammonia sampling when required.
Total Suspended Solids (TSS)	Monthly Average: 20 mg/L Daily Maximum: 30 mg/L Technology-based limits 40 CFR 440.102	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required and a TBEL remains in the permit.
Antimony	30 µg/L A&Ww chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Arsenic	30 µg/L FBC	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Barium	98,000 µg/L FBC	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Beryllium	5.3 µg/L A&Ww chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Boron	186,667 µg/L FBC	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.

Table 1. Permit limitations and monitoring requirements for Outfall 001 (Alum Gulch).

Parameter	Lowest Standard/Designated Use	Maximum Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/Rationale (1)
Cadmium (2)	6.2 µg/L A&Ww chronic 0.0039 kg/day (6.0 µg/L) WLA assigned in 2003 Alum Gulch TMDL 0.05 mg/L 30-day average 0.10 mg/L daily maximum Technology-based limits 40 CFR 440.103(a)	No Data	0	N/A	N/A	Monitoring with an effluent limitation based on the 2003 Alum Gulch TMDL WLA is required.
Chromium (Total)	1000 µg/L AgL	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Chromium VI	11 µg/L A&Ww chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Copper (2)	29 µg/L A&Ww chronic 0.011 kg/day (32 µg/L) WLA assigned in 2003 Alum Gulch TMDL 0.15 mg/L 30-day average 0.30 mg/L daily maximum Technology-based limits 40 CFR 440.103(a)	No Data	0	N/A	N/A	Monitoring with a WQBEL is required; the WQBEL is more stringent than the 2003 Alum Gulch TMDL WLA.
Cyanide	9.7 µg/L A&Ww chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Hardness	No applicable standard. Hardness is used to determine standards for specific metal parameters.	No Data	0	N/A	N/A	The hardness of the influent that will be treated by WTP1 is very high (estimated influent concentrations provided in the application are 610-2000 mg/L). Therefore, a hardness value of 400 mg/L (the maximum allowable hardness value that can be used to calculate standards, per Title 18, Chapter 11, Article 1, Appendix B, footnote d(ii)) was used to calculate the applicable limits for the hardness dependent metals. This number may be adjusted once effluent hardness data becomes available. Monitoring for hardness is required whenever monitoring for hardness dependent metals is required.

Table 1. Permit limitations and monitoring requirements for Outfall 001 (Alum Gulch).

Parameter	Lowest Standard/Designated Use	Maximum Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/Rationale (1)
Hydrogen sulfide	2 µg/L A&Ww chronic	No Data	0	N/A	RP Indeterminate (No Data)	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	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Lead (2)	10.94 µg/L A&Ww chronic 0.3 mg/L 30-day average 0.6 mg/L daily maximum Technology-based limits 40 CFR 440.103(a)	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required and a WQBEL is set.
Mercury	0.01 µg/L A&Ww chronic 0.001 mg/L 30-day average 0.002 mg/L daily maximum Technology-based limits 40 CFR 440.103(a)	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required and a WQBEL is set.
Nickel (2)	168 µg/L A&Ww chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Selenium	2 µg/L A&Ww chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Silver (2)	35 µg/L A&Ww acute	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Sulfides	No applicable standard	No Data	0	N/A	N/A	Indicator parameter for hydrogen sulfide. Monitoring for discharge characterization required. If sulfides are detected, monitoring for hydrogen sulfide is required for the remainder of the permit term.
Thallium	7.2 µg/L FC	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.

Table 1. Permit limitations and monitoring requirements for Outfall 001 (Alum Gulch).

Parameter	Lowest Standard/Designated Use		Maximum Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/Rationale (1)
Zinc (2)	379 µg/L A&Ww acute and chronic 2 kg/day (3,000 µg/L) WLA assigned in 2003 Alum Gulch TMDL 0.75 mg/L 30-day average 1.5 mg/L daily maximum Technology-based limits 40 CFR 440.103(a)		No Data	0	N/A	N/A	Monitoring with a WQBEL is required; the WQBEL is more stringent than the 2003 Alum Gulch TMDL WLA.
Whole Effluent Toxicity (WET)	No toxicity (A.A.C. R18-11-108(A) (6))	Pseudo-kirchneriella subcapitata (3)	No Data	0	RP Indeterminate (No Data)	RP Indeterminate (No Data) (4)	Monitoring required and an action level is set.
		Pimephales promelas	No Data	0	N/A	RP Indeterminate (No Data) (4)	Monitoring required and an action level is set.
		Ceriodaphnia dubia	No Data	0	N/A	RP Indeterminate (No Data) (4)	Monitoring required and an action level is set.

Footnotes:

1. The monitoring frequencies are as specified in the permit.
2. Hardness-dependent metal - the standard is for this parameter is based on the average hardness value of the effluent or receiving water as indicated above.
3. Formerly known as *Selenastrum capricornutum* or *Raphidocelis subcapitata*.
4. Monitoring with ALs or Action Levels always required for these parameters unless RP exists and limits are set.

Table 2. Permit limitations and monitoring requirements for Outfall 002 (Harshaw Creek).

Parameter	Lowest Standard/Designated Use	Maximum Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/Rationale (1)
Flow	---	---	---	---	---	Discharge flow is to be monitored on a continual basis using a flow meter.
pH (2)	Minimum: 6.5 Maximum: 9.0 A&Ww and PBC A.A.C. R18-11-109(B) Minimum: 6.0 Maximum: 9.0 Technology-based limits 40 CFR 440.102	No Data	0	N/A	WQBEL or TBEL is always applicable.	pH is to be monitored using a discrete sample of the effluent 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.
Temperature	R18-11-109C the discharge shall not cause an increase in the ambient water temperature. A&Wedw: no more than 3.0°C	No Data	0	N/A	N/A	Discharge temperature is to be monitored for discharge characterization by discrete sample. 40 CFR Part 136 specifies that discrete samples must be collected for temperature. Temperature sampling must also coincide with ammonia sampling when required.
Total Suspended Solids (TSS)	Monthly Average: 20 mg/L Daily Maximum: 30 mg/L Technology-based limits 40 CFR 440.102	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required and a TBEL remains in the permit.
Antimony	600 µg/L A&Wedw chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Arsenic	150 µg/L A&Wedw chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Beryllium	5.3 µg/L A&Wedw chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Cadmium (2)	4.5 µg/L A&Wedw chronic 0.05 mg/L 30-day average 0.10 mg/L daily maximum Technology-based limits 40 CFR 440.103(a)	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required and a WQBEL remains in the permit.
Chromium (Total)	1,000 µg/L AgL	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.

Table 2. Permit limitations and monitoring requirements for Outfall 002 (Harshaw Creek).

Parameter	Lowest Standard/Designated Use	Maximum Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/Rationale (1)
Chromium VI	11 µg/L A&Wedw chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Copper (2)	20 µg/L A&Wedw chronic 0.15 mg/L 30-day average 0.30 mg/L daily maximum Technology-based limits 40 CFR 440.103(a)	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required and a WQBEL remains in the permit.
Cyanide	9.7 µg/L A&Wedw chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Hardness	No applicable standard. Hardness is used to determine standards for specific metal parameters.	No Data	0	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 lower range of estimated WTP2 influent hardness of 258 mg/L as CaCO ₃ . Monitoring for hardness is required whenever monitoring for hardness dependent metals is required.
Hydrogen sulfide	2 µg/L A&Wedw chronic	No Data	0	N/A	RP Indeterminate (No Data)	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&Wedw chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.
Lead (2)	6.94 µg/L A&Wedw chronic 0.3 mg/L 30-day average 0.6 mg/L daily maximum Technology-based limits 40 CFR 440.103(a)	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required and a WQBEL remains in the permit.
Mercury	0.01 µg/L A&Wedw chronic 0.001 mg/L 30-day average 0.002 mg/L daily maximum Technology-based limits 40 CFR 440.103(a)	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required and a WQBEL remains in the permit.

Table 2. Permit limitations and monitoring requirements for Outfall 002 (Harshaw Creek).

Parameter	Lowest Standard/Designated Use	Maximum Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/Rationale (1)	
Nickel (2)	116 µg/L A&Wedw chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.	
Selenium	2 µg/L A&Wedw chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.	
Silver (2)	16 µg/L A&Wedw acute	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.	
Sulfides	No applicable standard	No Data	0	N/A	N/A	Indicator parameter for hydrogen sulfide. Monitoring required. If sulfides are detected, monitoring for hydrogen sulfide is required for the remainder of the permit term.	
Thallium	75 µg/L PBC	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required at an assessment level and for discharge characterization.	
Zinc (2)	262 µg/L A&Wedw acute and chronic 0.75 mg/L 30-day average 1.5 mg/L daily maximum Technology-based limits 40 CFR 440.103(a)	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring required and a WQBEL remains in the permit.	
Whole Effluent Toxicity (WET)	No toxicity (A.A.C. R18-11-108(A) (6))	<i>Pseudo-kirchneriella subcapitata</i> (3)	No Data	0	N/A	RP Indeterminate (No Data) (4)	Monitoring required and an action level is set.
		<i>Pimephales promelas</i>	No Data	0	N/A	RP Indeterminate (No Data) (4)	Monitoring required and an action level is set.
		<i>Ceriodaphnia dubia</i>	No Data	0	N/A	RP Indeterminate (No Data) (4)	Monitoring 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 effluent or receiving water as indicated above.
3. Formerly known as *Selenastrum capricornutum* or *Raphidocelis subcapitata*.
4. Monitoring with ALs or Action Levels always required for these parameters unless RP exists and limits are set.

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 of the 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 effluent limitations. Additionally, monitoring may be required to gather data for future effluent limitations or to monitor effluent 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 subsequent 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, an "8-hour composite" sample has been defined as a flow-proportioned mixture of two or more discrete samples (aliquots) obtained at equal time intervals over an 8-hour period (if only two samples are collected, they should be taken approximately 8 hours apart). 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.

Discrete (i.e., grab) samples are specified in the permit for parameters that for varying reasons are not amenable to compositing.

Monitoring locations are specified in the permit (Part I.A and Part II.A) in order to ensure that representative samples of the effluent 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.3) 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, Section B 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.

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 required 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.

Requirements for retention of monitoring records are detailed in Part II.C.3 of the permit.

XI. SPECIAL CONDITIONS (Part IV in Permit)**Permit Reopener**

This permit may be modified based on newly available information; to add conditions or limits to address demonstrated effluent 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)].

Translator Study

The permittee may perform a translator study on one or more metals for which effluent limits are established in this permit, to demonstrate what portion of metal in the effluent will be present in dissolved form in the receiving water. If accepted by ADEQ, the results may be used to modify total recoverable effluent limits for the metal(s) addressed in the translator study. Modifying an effluent limit based on the results of an approved translator study will not be considered anti-backsliding.

XII. 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 January Mine Hermosa Project will be to ephemeral washes which receive Tier 1 antidegradation protection. Except for flows resulting from rain events, the only water in the wash will be the effluent. Therefore, the discharge and the receiving water will normally be one and the same. Effluent quality limitations and monitoring requirements have been established under the proposed permit to ensure that the discharge will meet the applicable water quality standards in the receiving water and in the downstream portion of Alum Gulch (which has different designated uses). As long as the permittee maintains consistent compliance with these provisions, the designated uses of the receiving water will be presumed protected, and the facility will be deemed to meet currently applicable antidegradation requirements under A.A.C. R18-11-107.

XIII. STANDARD CONDITIONS

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

XIV. 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 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.

XV. ADDITIONAL INFORMATION

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

Arizona Department of Environmental Quality
Water Quality Division – Surface Water Permits Unit
Attn: Rachel Heinz
1110 West Washington Street
Phoenix, Arizona 85007

Or by contacting Rachel Heinz at (602) 771 – 0180 or by e-mail at heinz.rachel@azdeq.gov.

XVI. INFORMATION SOURCES

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

1. AZPDES Permit Application Form(s) 1 and 2C received July 11, 2022, 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 26, 2022.
3. ADEQ files on January Mine Hermosa Project.
4. ADEQ Geographic Information System (GIS) Web site
5. Information provided to ADEQ staff during a site visit to the facility on August 5, 2022.
6. Total Maximum Daily Load For: Upper Alum Gulch, Sonoita Creek Basin, Santa Cruz River Watershed, Coronado National Forest near Patagonia, Santa Cruz County, Arizona. HUC 15050301-561A. Parameters: Cadmium, Copper, Zinc, and Acidity. June 30, 2003.
7. Arizona Administrative Code (AAC) Title 18, Chapter 11, Article 1, *Water Quality Standards for Surface Waters*, adopted December 31, 2016.

8. A.A.C. Title 18, Chapter 9, Article 9. *Arizona Pollutant Discharge Elimination System* rules.
9. 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 440. *Ore Mining and Dressing Point Source Category*.
10. EPA Technical Support Document for Water Quality-based Toxics Control dated March 1991.
11. *Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs*, US EPA, May 31, 1996.
12. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA /821-R-02-013).
13. U.S. EPA NPDES Permit Writers' Manual, September 2010.
14. *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion*, US EPA, June 1996.

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