



Columbia Center on Sustainable Investment

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Legal Framework Governing Water Use¹

U.S. – Arizona

As of August 2016

1. Overview of legal framework in Arizona²

Arizona is the nation's leading producer of copper, responsible for about 60 percent of total U.S. copper production. The State also is a leading producer of molybdenum, sand and gravel and gemstones. More than one-fourth of the State's land is held in trust as reservations for the benefit of American Indians and is subject to a different set of mining and water laws.

Water appropriation in Arizona

Water management in Arizona has been described as a complex system of laws, rules and authorities that differ for type and source of water, as well as whether the water is being sourced on federal, tribal, or state land. Surface and ground water are regulated separately, while apportionment of water from Arizona's Colorado River water is governed by interstate compact, federal legislation and U.S. case law ("Law of the River").³ In addition, American Indian water rights are managed separately. The Arizona Department of Water Resources (ADWR) administers water management and water rights but several other Arizona governmental agencies, authorities and districts also affect aspects of water management and utilization.

Surface water is generally appropriated according to the doctrine of prior appropriation. Surface water permits are issued by the ADWR for a specific location (surface water rights attach to the land) and amount of water. **Ground water** use is subject to a reasonable use doctrine under the Arizona Ground Water Code⁴, with differing permitting rules on water withdrawals depending for different areas. Five areas of the State are designated as active management areas (AMAs), where the focus is on water conservation. Ground water use in AMAs is strictly regulated and limited. Outside of the AMAs, ground water can generally be withdrawn for reasonable and beneficial use. Mining is considered to be a beneficial use for these purposes.

¹ This project was managed by CCSI Senior Legal Researcher, Sophie Thomashausen. Research was conducted by CLS Law Student Sophie Stramm and Sophie Thomashausen. Interviews were conducted with Tom Buschatzke – Assistant Director of the Water Management Division of the Arizona Department of Water Resources (June 2015)

² For an overview of water in Arizona, see: "Layperson's Guide to Arizona Water," *Water Education Foundation and University of Arizona's Water Resources Research Center* (2007) available at:

http://www.azwater.gov/AzDWR/IT/documents/Layperson's_Guide_to_Arizona_Water.pdf.

³ Arizona Department of Water Resources (ADWR): "Arizona Water Atlas – Appendix C", available at:

www.azwater.gov/AzDWR/StatewidePlanning/WaterAtlas/documents/appendix_c.pdf.

⁴ Title 45, Chapter 2, Arizona Revised Statutes.



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The priority of **tribal claims to water** in the West was established in 1908 with the “Winters Doctrine.” Under this doctrine, an Indian reservation’s water right is linked to the date the reservation was established and its purpose. Since the *Arizona v. California* decision in 1963, an agricultural purpose has been assumed and the quantity of tribal water rights has been calculated based on a reservation’s “practicably irrigable acreage (PIA)”: land that could be farmed with irrigation at reasonable costs.

Waste water discharge

Water quality protection programs in Arizona are based on federal and state law and are administered by the U.S. Environmental Protection Agency (EPA) and the Arizona Department of Environmental Quality (ADEQ), respectively. Drinking water, groundwater and surface water all are protected through various permitting, monitoring and reporting, remediation, inspection and compliance assurance programs. The principal water quality protection programs in Arizona are the Safe Drinking Water Act (SDWA), the Aquifer Protection Permit program, the Water Quality Assurance Revolving Fund program and the Clean Water Act (CWA).

Arizona was the first state to recognize wastewater as a separate, growing source of water. Today, treated wastewater constitutes about 3 percent of the State’s supplies, with more being used to recharge groundwater aquifers for future use.

Cross-border water issues

The international border with Mexico presents special challenges for water management because even problems that are considered local can require the involvement of national level agencies. A special bi-national commission, the International Boundary and Water Commission (IBWC) has jurisdiction on matters involving cross-border waters.



2. Regulation of water use in the mining sector in Arizona

Water Quantity questions		
No	Question	Answer
1.	Which authority is responsible for water allocation?	The Arizona Department of Water Resources (ADWR)
2.	Water allocation process - How is water granted to a mining concessionaire/ permit holder? Is there a water licensing/ permitting process? A water market?	<p>Arizona has separate legal regimes governing the use of surface water, ground water and reclaimed water. Surface water is governed by the doctrine of prior appropriation⁵, whereas ground water is subject to the reasonable use doctrine and only ground water use outside of AMAs requires a permit. There is additionally a specific water allocation regime in relation to the Colorado River Water.</p> <p>There is a water market that mines may use if they are not getting all of the water they need via permit. It is the ADWR co-director's impression that this is not as commonly used as the permitting process. However, mines have become more conscious of their environmental impact and are attempting to use reclaimed water. They may bank reclaimed water and sell these credits to other users.</p>
3.	Scope of a water allocation permit/licence	
	(a) Requirements separate water permit – is a separate water permit required? What is the process for	<p>Separate permits are required for the use of surface water, ground water within AMAs and reclaimed water. No permit is required for ground water outside of an AMA.</p> <p>Surface water on public lands: Appropriation of surface water for mining purposes, a recognized beneficial use in Arizona, requires that an application for a permit to appropriate water be made to the ADWR.⁶</p> <p>The water appropriation application must state:</p> <ol style="list-style-type: none"> 1) The name and address of the mining company;

⁵ **The prior appropriation doctrine** states that water rights are determined by priority (“first use in time, first in right”) and beneficial use. This means that the first person to use water or divert water for a beneficial use or purpose at a specified rate of flow can acquire individual rights to the water. Moreover, the right continues as against subsequent users as long as the appropriator puts the water to beneficial use. For these purposes, beneficial use is defined as “the use of water by man for any purpose which benefits are derived, such as domestic, municipal, irrigation, livestock, industrial, power development, and recreation.”

⁶ Appropriable water as defined in A.R.S. § 45-141(A) is subject to appropriation and beneficial use by the public. Its use is governed by the provisions of Title 45, Chapter 1, A.R.S.



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		obtaining the permit	<p>2) The water supply from which the appropriation is applied for; 3) The nature and amount of the proposed use; 4) The location, point of diversion and description of the proposed works by which the water is to be put to beneficial use; and 5) The timing for when the required water to be used.⁷</p> <p>If for mining purposes, the application must also set forth the location and character of the mines to be served and the methods of supplying and utilizing the waters.⁸ The application may be accompanied by maps, drawings and data as prescribed by the director.⁹</p> <p>If the water use includes reservoir storage, the application must include a description of the dam, its capacity, and a description of the lands to be submerged.¹⁰</p> <p>The approval or rejection of a permit to appropriate is an administrative action, which is subject to the Uniform Administrative Appeal Procedure statutes.¹¹</p> <p><i>There is not much appropriable surface water left, and the process of applying for a surface water permit allows others to object on certain grounds, like an interference with existing water rights. As a result, very little surface water is currently permitted, and the water allocations that mining operations currently use were typically permitted a long time ago. Surface water permits are always good forever, as long as the water is used once within a five-year period.</i></p> <p>Groundwater permits: Because mining is a recognized beneficial use, groundwater may be used outside of AMAs without a permit if it does not interfere with the reserved rights of Native Americans to appropriate water or the rights of a prior appropriator.¹² Inside AMAs, groundwater use may be withdrawn and used only in accordance with the regulations described in the Groundwater Code. Groundwater rights for mining operations may be obtained through the acquisition of a Groundwater Withdrawal Permit, a Type 1 Non-Irrigation</p>
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⁷ ARS § 45-152(A)

⁸ ARS § 45-152(B)

⁹ ARS § 45-152(C)

¹⁰ ARS § 45-152; 45-161. For the purposes of this section, "dam" does not include any barrier constructed for the purpose of controlling liquid-borne material (i.e. tailings waste)(ARS § 45-1201). If the size of the dam falls within the jurisdiction of the Dam Safety Section of ADWR, a permit for storage will not be issued until the dam is approved by that Section

¹¹ *Id*; A.R.S. § 45-153(A)

¹² Interview with Marc Simon.



			<p>Grandfathered Right (GFR)¹³, or a Type 2 Non-Irrigation GFR.¹⁴</p> <p>Groundwater Withdrawal Permits are issued for a specific duration and amount of water when GFRs are not available. Most mines in Arizona are able to obtain the groundwater that they need through GFRs.¹⁵ However, there is a specific category of groundwater withdrawal permit for mineral extraction and metallurgical processing.¹⁶</p> <p>Permits to withdraw groundwater specifically for the purpose of extracting and processing minerals will only be granted if:</p> <ol style="list-style-type: none"> 1. The amount of groundwater available for mineral extraction, metallurgical processing and compliance with applicable environmental controls under a dewatering permit is insufficient; 2. Uncommitted municipal and industrial central Arizona project water is not available at the point where the operator's wellhead or distribution system would otherwise be, at a cost which does not exceed the current municipal and industrial central Arizona project delivery rates; 3. Other surface water of adequate quality or effluent of adequate quality is not available at the point where the operator's wellhead or distribution system would otherwise be, at a cost, including treatment costs, which does not exceed by 25% the cost the operator would otherwise incur in withdrawing groundwater; 4. The mining company does not own or lease type 2 non-irrigation grandfathered rights originally based on withdrawals of groundwater for the extraction or processing of minerals that the mining company is not using or leasing and that can be used at the proposed location without imposing an unreasonable economic burden on the mining
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¹³ **Grandfathered Rights** are rights to withdraw and use groundwater based on the fact of lawful withdrawals and use of groundwater prior to the date of the designation of an active management area (A.R.S. § 45-402).

¹⁴ A Type 1 Non-Irrigation GFR applies to land that has been retired from irrigation after January 1, 1965 in anticipation of specific non-irrigation use (A.R.S. § 45-463). A Type 1 GFR may not be transferred to another location, although water pumped from the original location may be transported to a new location. A Certificate of Grandfathered Right is issued for these rights by the Arizona Department of Water Resources. A Type 2 Non-Irrigation GFR is a right to use non-irrigation withdrawals of groundwater equal to the maximum groundwater withdrawal and use for any one year during the five-year period prior to 1980 (A.R.S. § 45-4640). Certificates of Grandfathered Rights for Type 2 Non-Irrigation GFRs are transferrable anywhere within the active management area (AZ Permit Guide, p 55).

¹⁵ Interview with Marc Simon.

¹⁶ A.R.S. § 45-514.



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			<p>company.¹⁷</p> <p>There are various fees associated with groundwater withdrawal applications and well drilling set forth in A.A.C. R12-15-151, including an application for groundwater withdrawal permit (\$150 submitted with the application and \$50 with the issuance of the permit), application for hydrologic testing (\$50), conveyance of a groundwater withdrawal permit (\$35) and the registration of an existing well (\$10). A notice of intent to drill a new non-exempt well is \$10. A permit for a new non-exempt well or the enlargement of an existing well is \$80.</p> <p>Reclaimed Water Permits: Permits are required for mines where reclaimed water is applied or used. Gray water use is also regulated under the reclaimed permit rules. No permit is required for the construction or operation of conveyances of reclaimed water, but technical standards are prescribed in rule under Article 6.¹⁸ A reclaimed water individual permit is required for reclaimed water uses that do not otherwise fall into one of the general permit categories.</p> <p>Direct reuse does not include the use of water after discharge under an AZPDES permit or an Aquifer Protection Permit, or in a workplace subject to a federal program that protects workers from workplace exposures. A reclaimed water individual permit requires an initial fee of \$1,000 and is reviewed on an hourly basis up to a maximum fee of \$32,000. Flat fees apply to the general permits.</p> <p>Colorado River Water: This water is delivered through the Central Arizona Project. These allocations are formally made by the secretary of the interior. ADWR makes recommendations on allocations of these waters. Most of the water was already allocated in the 1980s and there is very little left to allocate.</p> <p>Water appropriation on Indian lands in Arizona: Native American tribes in Arizona have reserved rights to appropriate the water they need, and where a new user may interfere with their rights, they have the ability to object to the new use.¹⁹</p>
		<p>(b) Time required to obtain permits</p>	<p>For both ground water and surface water permits, it typically takes less than 30 days for approval by ADWR and is fairly straight forward because of the rights granted to beneficial water users under the Arizona Revised Statutes.²⁰</p>

¹⁷ A.R.S. §45-514(A)(1)-(4)

¹⁸ 18 A.A.C. § 9-6,7

¹⁹ Interview with Marc Simon.

²⁰ Interview with ADWR.



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		<p>– how long does it generally take?</p>	<p>The deadlines for processing Type 1 and Type 2 GFRs are 120 days, including 30 days to determine completeness and 90 days for substantive review. The time frame for processing groundwater withdrawal permits are 30 days for completeness and 70 days for substantive review. The time frame for processing a Notice of Intention (NOI) to drill, deepen or modify a well is 15 days after receipt of a complete and correct notice.²¹ The time frame for processing a non-exempt well permit is 60 days after receipt of a complete and correct application.²²</p> <p>For reclaimed water, ADWR looks at hydrologic modeling to see how the water use would impact the relevant aquifer. A simple permit can take a few months, but a more complex one might take up to a year to be approved.</p>
		<p>(c) Duration of water permit</p>	<p>Surface water permits are always good forever, as long as the water is used once within a five-year period.</p> <p>Groundwater permits may be granted for up to five years, subject to renewal under the same criteria used in granting them originally.²³ If, during the duration of a mineral extraction and metallurgical processing permit, the director determines that uncommitted municipal and industrial central Arizona project water is available or surface water of adequate quality or effluent of adequate quality is available to the mining company at a cost comparable to groundwater, the director may require the mining company to use such water in lieu of groundwater.²⁴</p>
		<p>(d) process for permit renewal</p>	<p>N/A for surface water.</p>
	<p>How does the process of securing a water allocation relate to the general mining permit approval process (i.e. is a water permit required before a mining permit, or is information about water</p>	<p>An Environmental Impact Statement (EIS) is required before a mine will be approved to begin operating. A mine would need to have all of its water sources and permits secured before submitting this document, as this information is a component of the statement.</p>	

²¹ A.R.S. § 45-596.D.

²² A.R.S. § 45-599.D.

²³ A.R.S. §45-514(B).

²⁴ A.R.S. §45-514(C).



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	<p>use required for an EIA which is required for a mining permit)?</p>	<p><i>Before opening, as a part of the EIS, and NEPA requirements, water supplies must be identified. Therefore, a mine will already have had its permits approved by ADWR before it begins operations.</i></p>
<p>4.</p>	<p>Tariffs for water use Do mines have to pay for water usage? If yes, who sets the tariffs?</p>	
<p>5.</p>	<p>Requirements for recycling water</p>	<p>There are no formal requirements under Arizona law for mines to recycle water. However, if the mine is located in an Active Management Area, there are requirements to use best management practices to try to be as efficient as possible. Regulatory requirements are embedded in AMA management plans. Where a mine produced reclaimed water, it owns the effluent until it relinquished control of the reclaimed water, and it can sell it.</p> <p>Conservation requirements for reclaimed water are created in a way to try to incentivize reuse instead of creating discharge into the river.</p> <p>Conservation Requirements for Mines Inside AMAs: AMAs are geographical areas which has been designated as requiring active management of groundwater or, in the case of the Santa Cruz active management area, active management of any water, other than stored water, withdrawn from a well.²⁵</p> <p>Chapter 2, Article 9 of the A.R.S. § 45 establishes a series of management plans applicable within the five AMAs, which establish conservation requirements for all water users, including mines.²⁶</p> <p>Conservation requirements in the management plans for metal mines include provisions to regulate transport tailings density, to reduce water loss from tailings impoundments, to minimize water use in leaching processes, and to prepare a long-range conservation plan.²⁷</p> <p>Exemptions are provided when these requirements conflict with other environmental regulations. An alternative program is also provided if the mine demonstrates that the best available conservation technologies consistent with reasonable economic return are being applied to the mine.²⁸</p>

²⁵ ARS §45-402.2

²⁶ Arizona Bureau of Land Management – Arizona State Office: “Arizona Mining Permit Guide” p. 56, available at: <http://www.blm.gov/pgdata/etc/medialib/blm/az/pdfs/3809.Par.10193.File.dat/az-mine-permit-guide.pdf>.

²⁷ Ibid.

²⁸ Ibid.



6.	<p>What rights, if any, does the Authority have to change the amount of water allotted to a mine? Is the mining company allowed compensation for such changes?</p>	<p>Applications for permit to appropriate public water must be approved by the Director of ADWR, and will be approved or denied based on whether or not:</p> <ul style="list-style-type: none"> - The proposed use will interfere with vested or existing water rights; - The director perceives the use to “threat(en) public safety;” - The use threatens the public interest and welfare. ²⁹ <p>ADWR does not directly have rights to change the amount of water allotted to a mine, but for permits that must be renewed, ADWR may consider other users and any interference a mine poses when deciding whether or not to reapprove a mine’s water allocation.</p>
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5. Regulation of water quality and waste water discharge in mining in Arizona

Water Quality questions		
No	Topic	Answer
1.	<p>Requirements for a permit for mine waste discharge</p> <p>Does a mine have to apply for a permit to discharge waste/ waste water into surrounding water courses? If so, what permits are required? What is the permitting process?</p>	<p>Mining operations require several discharge permits under federal and state law: If a mine plans to discharge into ground water, it must obtain an Aquifer Protection Permit. If a mine discharges from a point source into waters of the U.S., it must obtain an AZPDES permit, the Arizona-administered version of the National Pollutant Discharge Elimination System (NPDES) permit.³⁰ If a mine has stormwater discharge, it will be required to obtain an AZPDES stormwater permit.³¹ A mine proposing to discharge dredged or fill material into U.S. waters, including wetlands, must obtain a Section 404 permit from the Corps.³² Finally, a mine proposing construction activity in or near or altering any navigable water of the United States must obtain a Section 10 permit.³³</p> <p>1. Aquifer Protection Permits (APPs): Any person who discharges or who owns or operates a facility that discharges must obtain an aquifer protection</p>

²⁹Arizona Department of Mines & Mineral Resources: “Arizona Mining Permitting Guide”, 53, available at: http://repository.azgs.gov/sites/default/files/dlio/files/nid1128/arizona_mining_permitting_guide_2011.pdf.

³⁰ Arizona Mining Permitting Guide, 108; 40 C.F.R 440.

³¹ Stormwater discharge associated with industrial activity means the discharge from any conveyance which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing, or raw material storage areas at an industrial plant.

³² Bureau of Land Management – Arizona State Office: “Arizona Mining Permit Guide”, p 111, available at: <http://www.blm.gov/pgdata/etc/medialib/blm/az/pdfs/3809.Par.10193.File.dat/az-mine-permit-guide.pdf>.

³³ Mining Permit Guide at p 131.



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		<p>permit from the director of ADEQ.³⁴ General and individual APPs are available.³⁵</p> <p>The director must provide public notice and an opportunity for public comment on any request for a determination from the director under §49-241(B) that there will be no migration of pollutants from a facility. A public hearing may be held at the discretion of the director if sufficient public comment warrants a hearing. The director may inspect and may require reasonable conditions and appropriate monitoring and reporting requirements for a facility managing pollutants that are determined not to migrate under §49-241(B). The director may identify types of facilities, available technologies and technical criteria for facilities that will qualify for such a determination. The director's determination may be revoked on evidence that pollutants have migrated from the facility. The director may impose a review fee for a determination under subsection B of this section. Any issuance, denial or revocation of a determination may be appealed pursuant to section §49-323.³⁶</p> <p>To obtain an individual APP a mine must demonstrate the following: that Best Available Demonstrated Control Technology (BADCT) will be utilized to prevent or eliminate the discharge of pollutants, that aquifer water quality standards will not be violated in groundwater at the point of compliance, that the mining company has financial and technical capability to comply with the permit, and that the property has been properly zoned for the activity.³⁷</p> <p><i>ADEQ encourages mining companies to have a pre-application meeting to discuss issues relevant to permitting such as groundwater monitoring, design, operations, and closures. A pre-application meeting will help the mining company finish the Individual Permit Application and prepare supporting documentation. A thorough, complete application may result in faster processing times and lower processing fees.³⁸ ADEQ offers an optional administrative completeness review (ACR) meeting where the project management team meets with the mining company to assess the completeness of the application packet. The Administrative Completeness</i></p>
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³⁴ A.R.S. §49-241(A).

³⁵ An individual permit is a permit specifically tailored for an individual facility. A general permit covers multiple facilities within a specific category. The more complex the point source discharge, the more likely an individual permit is required.

³⁶ §49-241(C)

³⁷ "BADCT" means the best available demonstrated control technology, process, operating method, or other alternative to achieve the greatest degree of discharge reduction determined for a facility by the Director under A.R.S. § 49-243 (18 A.A.C. 9).

³⁸ "Water Quality Division: Permits: Aquifer Protection Permits (APP), available at: <https://www.azdeq.gov/envirom/water/permits/app.html#indiv> .



*Checklist will aid the mining company in preparing a complete submittal. At the end of the meeting, ADEQ will either accept the application as "administratively complete" or return it to the mining company with an explanation of the problems. Applications that are administratively complete will go to the substantive review phase. This may save 4-6 weeks of processing time.*³⁹

Information about Permit Fees can be found on the ADEQ website.⁴⁰ A \$2,000 initial fee is required at the time an application is submitted to the Department for review of any water quality protection service subject to an hourly fee. For APP Compliance Schedule Item (CSI) review, the Department has established Alternative Initial Fees for Compliance Schedule Items that are not Aquifer Protection Permit (APP) Amendments, which are significantly less than \$2,000.00 (A.A.C. R18-14-103).⁴¹

Individual permits are issued for the operational life of the facility. **Individual permits review may take from six months to more than a year to complete, depending on the complexity of the project, the extent of public involvement, and the responsiveness of the mining company.**⁴²

2. Arizona Pollutant Discharge Elimination System (AZPDES) Permit

For information on the NPDES Permit Program, see the [Federal template](#)

This permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.⁴³ The permit was administered federally until 2002 when ADEQ was delegated to administer the point discharges under section 202 of the Clean Water Act for state lands.

Allowable discharges from mining facilities can generally be classified as either stormwater or mine drainage, and both are required to comply with the **Arizona Water Quality Standards**.⁴⁴ Discharges of mine drainage are also subject to the technology based effluent guidelines promulgated for mining facilities at 40 C.F.R. 440. Water quality standards are typically more stringent than the effluent guidelines in 40 C.F.R. 440.⁴⁵

3. AZPDES Permit for Stormwater Discharge: Stormwater discharge associated with industrial activity such as mining means the discharge from

³⁹ Ibid.

⁴⁰ ADEQ – Water Quality Division – Fees, available at: <https://www.azdeq.gov/envirom/water/permits/fees.html>.

⁴¹ This schedule can be accessed at: <https://www.azdeq.gov/envirom/water/permits/download/aif.pdf>.

⁴² Arizona Mining Permitting Guide, 101.

⁴³ Arizona Mining Permitting Guide, 108; 40 C.F.R 440.

⁴⁴ CWA §502(14).

⁴⁵ Arizona Mining Permitting Guide, 108.



any conveyance which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing, or raw material storage areas at an industrial plant. **Since 1998, runoff from waste rock dumps and haul roads constructed of waste rock, which does not mix with other mine drainage, is considered stormwater.** No permit is needed if industrial activities are not exposed to stormwater.⁴⁶ For coverage under ADEQ’s general stormwater permit, discharges are authorized 48 hours after notice of intent is postmarked, unless otherwise notified by ADEQ.

AZPDES Permitting process: A mine will either be issued an individual or general permit.⁴⁷ An individual permit is a permit specifically tailored for an individual facility.⁴⁸ A general permit covers multiple facilities within a specific category. The more complex the point source discharge, the more likely an individual permit is required.⁴⁹ EPA has developed a general permit for industrial facilities discharging stormwater into waters of the U.S. - the stormwater Multi Sector General Permit (MSGP), and mining operations discharging only stormwater may apply for coverage under the MSGP.⁵⁰ For discharges of mine drainage, or for discharges of mine drainage mixed with stormwater, an individual AZPDES permit is required. ADEQ will determine which type of permit (individual vs. general) is most appropriate for a specific discharge and may require a specific facility to apply for an individual permit for discharges of stormwater. **Once a complete AZPDES permit application is received, processing time is generally between six months to one year, depending on the complexity of the project and there is no fee.**⁵¹

4. Section 404 Dredge and Fill Permits: Any person or entity proposing a project that will result in a discharge of dredged or fill material into waters of the United States, including wetlands, must obtain a Section 404 permit from the Corps.⁵² Mining companies must demonstrate that a proposed project has been designed in a manner that avoids impacts to waters of the U.S. to the

⁴⁶ 40 CFR 122.26(b)(14).

⁴⁷ A.R.S. § 255.01.

⁴⁸ EPA: “Water Quality Standards Academy”, available at: http://water.epa.gov/learn/training/standardsacademy/permit_page4.cfm.

⁴⁹ Ibid.

⁵⁰ “EPA’s Multi-Sector General Permit”, available at: <http://water.epa.gov/polwaste/npdes/stormwater/EPA-Multi-Sector-General-Permit-MSGP.cfm>.

⁵¹ Arizona Mining Permitting Guide, 109.

⁵² Arizona Mining Permitting Guide, 111. The “Tulloch” Rule defines the term “discharge of dredged material” to include: “any addition, including any redeposit, of dredged material, including excavated material, into waters of the United States which is incidental to any activity, including mechanized land clearing, ditching, channelization, or other excavation.”



		<p>maximum extent possible.⁵³ Furthermore, a Section 401 water quality certification from ADEQ is required prior to issuance of a 404 permit.</p> <p>The Bureau of Land Management suggests that exceptions are limited, and that a mine should assume that a Section 404 permit is required and consult with the Army Corp of Engineers to discuss any doubts.⁵⁴ A fee is charged upon issuance of an individual permit (\$10 for non-commercial projects, \$100 for commercial/industrial projects). No fee is charged for general permit authorizations or Letters of Permission.⁵⁵ It takes an average of 30-60 days for most general permits and letters of permission. Individual permits typically require 180 days processing time.⁵⁶ Longer processing times may be expected for complex projects or instances where there are endangered species or cultural resource concerns.⁵⁷</p> <p>5.Underground Injection Control: Solution mining techniques that use injection and extraction wells require an additional permit for such activities through the U.S. Environmental Protection Agency’s Underground Injection Control (UIC) Program.⁵⁸</p>
<p>2.</p>	<p>Other licensing/permitting processes that cover water quality/discharge</p>	<p>Discharge into State drinking water sources is regulated by State permit pursuant to the Safe Drinking Water Act. Under the SDWA States establish drinking water standards and may establish permit programs to allow discharges that may affect drinking water sources.</p>
<p>3.</p>	<p>Nexus with environmental impact assessments/statements</p> <p>What is the process for obtaining an environmental impact assessment? At which stage of the mining process must it be obtained? To what extent are water issues covered in it?</p>	<p>An Environmental Impact Statement is required before a mine will be approved to begin operation. A mine would need to have all of its water sources and permits secured before submitting this document, as this information is a component of the statement.</p>

⁵³33 C.F.R. 320-332; Arizona Mining Permitting Guide, 111

⁵⁴ Arizona Mining Permitting Guide, 112.

⁵⁵ Ibid.

⁵⁶ Ibid.

⁵⁷ Ibid.

⁵⁸ Information on the UIC Program is available at <http://water.epa.gov/type/groundwater/uic/>.



4.	Are there regulations regarding the storage of tailings/ waste water by mines?	As a part of the post-closure plan required in submission, a mine must address how it will deal with acid mine draining. A mining company for an individual APP must adequately characterize any tailing or other waste materials that are subject to the APP program requirements (e.g., materials that discharge). In the case of waste rock, the mining company should conduct an ABA analysis if that waste rock facility will discharge, and if it has the potential to be acid generating (e.g., if the rock contains significant sulfide minerals and/or minimal carbonates). Sufficient documentation of the nonacid generation potential must be submitted to ADEQ. Conservation requirements in the management plans required for mining operations in AMAs include provisions to regulate transport tailings density, to reduce water loss from tailings impoundments, to minimize water use in leaching processes, and to prepare a long-range conservation plan. ⁵⁹
5.	Acid mine drainage regulations	Environmental impacts regarding acid mine drainage are typically handled at the post-mine closure stage of a mine’s life cycle, the regulation of which is handled at a State level.
7.	Any specific regulation of waste for copper and/or gold mining?	No

5. Monitoring

General questions		
No	Question	Answer
1.	Are there any monitoring requirements?	Yes. Monitoring is conducted by the Arizona Department of Environmental Quality (ADEQ). Monitoring related to NPDES permits is conducted at ADEQ’s discretion, and usually done once every two years. ⁶⁰
2.	Are there any reporting requirements?	<p>Reports required in accordance with Arizona Revised Statutes (A.R.S.) 45-632 are submitted annually and contain the following information:</p> <ul style="list-style-type: none"> • The amount of water used for dust control, tailings revegetation, domestic use, and transportation of tailings to the impoundments. The water quantities for dust suppression and revegetation should be measured and reported separately. • The quantity of water, including effluent, used for equipment washing, leaching, and milling.

⁵⁹ Arizona Mining Permitting Guide, 56.

⁶⁰ Interview with Ken Greenberg, ADEQ.



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		<ul style="list-style-type: none"> • The volume of water, including effluent, obtained from tailing impoundments and pit dewatering. • Average gallons of water consumed per ton of mineral produced. • Average percentage of solids by weight in tailings transported to impoundments for that year and each of the two previous years. • Average annual depth of water at the deepest portion of the stilling basin(s). • Copies of aerial photos of tailing impoundments with scale indicated, to determine the wetted surface area of the tailings impoundments. • Description of additional conservation techniques that were used at the facility. If there are contiguous mining operations owned by the same proprietor, and some are pre-1985 and others post-1984, these could be reported together in one document.
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6. Regulation of water issues related to post mine closure in Arizona

Post-mine closure questions		
No	Question	Answer
1.	Requirements for closure	<p>In order for a mine to obtain a mineral lease permit, one of the first steps towards beginning operations, it must agree to certain closure obligations contained: "Upon any partial or total relinquishment, or the cancellation or expiration of the permit other than by issuance of a mineral lease, the mining company shall fill any holes, ditches or other excavations, as may be required by the commissioner, and, as far as reasonably possible, reclaim the surface to its former condition."⁶¹</p> <p>Preparation of a mine closure and reclamation plan as part of a mineral lease permit application: To obtain a mineral lease permit, a mining company must prepare a Mineral Development Report for approval by the Arizona State Land Department (A.R.S. §27-252). This report is a comprehensive document, which must include a geological evaluation of the mine location, an economic feasibility assessment, an environmental assessment, and a mine operation and reclamation and closure plan.</p> <p>The issuance of a mining lease generally requires six to nine months from the</p>

⁶¹ A.R.S §27-252(B).



		<p>time of application. Approval of a mine operation and reclamation and closure plans requires around 60 days from the date of receipt.</p> <p>Post-mine closure standards are also incorporated into initial permits for water use as a part of mining. For example, mining companies for the Aquifer Protection Permit (APP) must follow Best Available Demonstrated Control Technology (BADCT) in accordance with the A.R.S. When considering technologies, processes, operating methods and other alternatives for purposes of a BADCT design, a facility must be evaluated in terms of 1) siting; 2) design, construction, and operation; and 3) closure and post-closure. Thus, the mine must employ BADCT in its post-closure plan before it will be allowed an APP.⁶²</p> <p>If a mine maintains an underground storage tank, its temporary or permanent closure must be completed in a way that prevents the release of regulated substances. The director shall prescribe by rule standards for these activities.⁶³</p> <p>When a mine wishes to close, it must submit a notice of its intent to do so, followed by a closure plan, which in summary includes the following:⁶⁴</p> <ul style="list-style-type: none"> - As-builts of closed facilities that will remain (such as the heap leach and tailings impoundments). - Assessment of soil conditions after closure. - Monitoring plan for physical inspections of closed facilities. that will remain and sampling for groundwater quality. - Contingency plan for discharges above approved levels, groundwater quality degradation, or physical damage to closed facilities. - Recordkeeping and reporting schedule. - Future updates of the groundwater model. <p>The plan must be approved by the director of the Arizona Department of Environmental Quality.</p>
	<p>(a) Closure plan: What are the requirements for a closure plan? Who</p>	<p>This mine operation and reclamation and closure plan must include the following components:</p> <ul style="list-style-type: none"> - Site information, such as topography, property lines, structures, and facilities. - A description of closure procedures, including an analysis of alternative measures. - Site-specific and regional hydrologic and geologic characteristics

⁶² ADEQ: “Arizona Mining Guidance Manual BADCT: Part 1 – General BADCT Information - The BADCT Process.”, available at: <https://www.azdeg.gov/environ/water/wastewater/download/badctmanual.pdf>.

⁶³ ARS §49-1008.

⁶⁴ Arizona Administrative Code, Title 18, Chapter 9: R18-9-A209. Temporary Cessation, Closure, Post-closure, available at: http://apps.azsos.gov/public_services/Title_18/18-09.pdf.



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	approves it, if anybody?	<ul style="list-style-type: none"> - Detailed closure methods for each facility. - Groundwater model demonstrating that future impacts to water quality from facilities that will continue to discharge (such as drainage from unlined impoundments) will not be above regulatory levels. - Financial assurance that the company is fiscally sound to complete the closure. - Demonstration that the mining company (or its subcontractors) have the technical ability to complete closure. <p>See here for ADEQ’s closure and post closure plan and cost estimator checklist.</p>
	(b) Bond requirements	Financial assurance is required to be provided and will be released once closure has been approved.
3.	Post-mine closure monitoring plans	Monitoring post closure must be submitted as part of the closure plan submitted to the Department of Environmental Quality prior to closure.
4.	Are there any reporting requirements in relation to a mine’s preparation for post-closure?	Yes – these will depend on the monitoring requirements agreed to with the Department of Environmental Quality.

7. Enforcement/ Regulatory actions

General questions		
No	Topic	Answer
1.	Enforcement actions available to the government/ public authorities/ citizens take for breach of any of the relevant laws/ regulations	<p>The public may file complaints with the ADWR, after which ADWR will conduct an independent investigation which may involve any level of enforcement action, from nothing to a criminal case. Citizens can initiate citizen suits for CWA violations under section 505(a)(2).</p> <p>ADEQ, EPA and ADWR are able to take action for breach of relevant laws/regulations, discussed further below.</p>
2.	Bodies responsible for regulatory enforcement and associated procedures	Arizona Department of Environmental Quality (ADEQ), EPA, ADWR are granted enforcement capacity through the ARS and the CWA.
3.	Is there an online database of penalties/fines related to water use in the mining sector	ADEQ: Arizona Unified Repository for Informational Tracking of the Environment stores ADEQ’s information on all places which are the facilities, sites, or objects that ADEQ regulates, monitors or generally is interest in.



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		<p>AZURITE is also used for environmental enforcement and compliance reporting to the Permit and Compliance (PCS) system and to the Air Facility System Universal Interface (AFS-UI).⁶⁵ It can be accessed here: https://www.azdeq.gov/databases/ltfsearch.html</p> <p>EPA: The Echo database contains information on compliance/enforcement actions. It can be accessed here: http://echo.epa.gov/</p>
4.	Procedure for bringing a case and court in which case would be brought	<p>ADWR has the capacity to initiate judicial proceedings for violations of the Surface Water Code in the Arizona Superior Court in the County where the violation is alleged to have occurred. In these proceedings, ADWR may request injunctive relief, but may not seek civil penalties. Final decisions are made by the Superior Court Judge, and may be appealed under the Arizona Rules of Appellate Procedure.⁶⁶ All other enforcement hearings related to ADWR regulatory programs are set before OAH upon request of ADWR through the Legal Division.⁶⁷</p>
5.	Who has standing to bring a case?	<p>Citizens can have standing to directly bring a case for a violation of the CWA, or the CWA or ADEQ may initiate a case.</p>

⁶⁵ http://www.epa.gov/enviro/html/fii/prog_sys.html#azurite

⁶⁶ ADWR: "Compliance and Enforcement Manual" at p. 20.

⁶⁷ See A.R.S. §§ 45-136(A), 318(A), 634(A), 881.01(A), 062(A) and 1221(A).



ANNEXURE

A. Relevant Legislation (policies, laws, and regulations) governing water issues in the mining sector in Arizona⁶⁸

No.	Name of Legislation	Brief description of how it applies
Mining laws		
	Mining Law of 1872 (30 U.S.C. §§ 401-413)	The Federal Mining Law provides rights of free access to unrestricted public lands for purposes of claiming and recovering most metallic minerals. It also provides mechanism for claimants to obtain full title to claimed public lands.
Environmental and water laws		
	Comprehensive Environmental Response, Compensation, and Liability Act 1980 (“CERCLA”)	<p>CERCLA creates a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over five years, \$1.6 billion was collected and the tax went to a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites. CERCLA sets forth a number of obligations and requirements:</p> <ul style="list-style-type: none"> • It establishes prohibitions and requirements concerning closed and abandoned hazardous waste sites; • It provides for liability of persons responsible for releases of hazardous waste at these sites; and • It establishes a trust fund to provide for cleanup when no responsible party could be identified. <p>CERCLA authorizes both short term removal actions and long term remediation response programs.</p> <p>CERCLA was amended by the Superfund Amendments & Reauthorization Act (SARA) of 1986. SARA, among other things, increases the level of state involvement in CERCLA remediation.</p>

⁶⁸ Specifically copper and gold, which are hard rock minerals. Also note that there may be some references to water use, environmental/ water discharge, and post-closure obligations in the mining code/ general mining legislation.



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	Federal Water Pollution Control Act 1972 ((The “Clean Water Act” or “CWA”) (33 U.S.C. § 1251 et seq.)	Under the Clean Water Act, mining companies must apply for Section 402 and/or Section 404 permits for mining-related discharges or dredge and fill operations in bodies of water.
	Arizona Groundwater Code (1980)	The goals of the groundwater code are to 1) control severe groundwater depletion and 2) provide the means for allocating Arizona’s limited resources to most effectively meet the state’s changing water needs. The state is divided into Active Management Areas (AMAs) (Prescott, Phoenix, Pinal, Tuscan, and Santa Cruz) and Irrigation Non-Expansion Areas (INAs). AMAs are subject to regulation under the Groundwater Code and INAs are subject to separate restrictions on irrigation.
	Arizona Revised Statutes (ARS)	Statutory laws in the state of Arizona. There are 49 titles, applicable titles include §27 “Minerals, Oil and Gas” and §49 “The Environment.”
	Arizona Administrative Code (AAC)	Official Rules of the State of Arizona.
Land Management Laws		
	Federal Land Policy and Management Act (“ FLPMA ”) (43 U.S.C. §§ 1701-1782)	The FLPMA governs the way the Bureau of Land Management (BLM) and U.S. Forest Service (USFS) administer public lands, including mining on public lands. Under the FLPMA, any actions related to land use made by the BLM or U.S. Forest Service are subject to the approval of the EPA. Federal land managers generally require Plans of Operation, which include reclamation plans and provide details of the proposed operations.
	The National Environmental Policy Act of 1969 (“ NEPA ”) (42 U.S.C. §§ 4321-4327)	NEPA establishes a public, interdisciplinary framework for Federal decision-making and ensures that agencies take environmental factors into account when considering Federal actions, notably in relation to Environmental Impact Statements/findings of no substantial impact.



B. List of relevant departments/ agencies/ authorities involved in the regulation of water issues in the mining sector in Arizona

No.	Name (In English and local language)	Brief description of its role
	U.S. EPA	<p>The central coordinating agency for implementation of environmental quality standards legislation. The EPA:</p> <ul style="list-style-type: none"> • Administers the National Pollutant Discharge Elimination System (NPDES) (as authorized by the Clean Water Act) in collaboration with State environmental agencies; • Issues underground injection control permits, as authorized by the Safe Drinking Water Act; and • Issues hazardous waste identification number pursuant to RCRA.
	U.S. Army Corps of Engineers (USACE)	The USACE administers discharge permits under Section 404 of the Clean Water Act.
	<u>Arizona Department of Water Resources</u> (ADWR)	<p>The ADWR is a, cabinet-level agency. It:</p> <ul style="list-style-type: none"> • Administers state water laws except those related to water quality; • Oversees the use of surface and groundwater resources under state jurisdiction; and • Negotiates with external political entities to protect and augment Arizona’s water supply.
	<u>Arizona Department of Environmental Quality</u> (ADEQ)	The ADEQ is a state cabinet-level agency that directs all of Arizona’s environmental protection programs. ADEQ’s mission is to “protect and enhance public health and the environment in Arizona.” The department oversees the state’s environmental laws and authorized federal programs to prevent pollution of the air, water, and land, and to ensure clean up of such pollution when it occurs. ⁶⁹
	<u>Bureau of Land Management – Arizona State Office</u>	The Federal Government office with the complete set of land and mineral records for Federal lands in a particular State is the BLM State Office.

⁶⁹ <https://azdeq.gov/function/about/index.html>



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		<p>The BLM State Office is the only office where the mining claim records are filed and available for public inspection. The BLM has been delegated by the Secretary of the Interior with the primary responsibility for administering the laws and regulations regarding the disposal of all minerals from all federally owned lands.⁷⁰</p>
	U.S. Forest Service (USFS)	<p>Exploration and mining activities on lands administered by the USFS are subject to the regulations in 36 CFR 228(A). Any proposed operation that could likely cause significant disturbance of surface resources must obtain the prior approval of the USFS.</p>

⁷⁰ The BLM's statutory authority here is derived from the General Mining Law of 1872, as amended (30 U.S.C. §§ 22 et seq.), the original public land authority in 43 U.S.C. §§ 2, 15, 1201 and 1457, and FLPMA (43 U.S.C. 1701 et seq.). These statutes, together with the implementing regulations (43 CFR Groups 3700 and 3800) and numerous judicial and administrative decisions that have interpreted them, make up the body of the mining law system.⁷⁰