

Stakeholder Proposal Submitted January 6, 2022:
Alternative Mining Conservation Program

The Alternative Mining Conservation Program (AMCP) for Large-Scale Metal Mining and Processing Facilities utilizes water conservation and management practices to maximize efficiency and reduce the amount of groundwater pumped from within the _____ AMA for use at the mines. Water is required for many activities at a mine site, including ore processing, dust and fire suppression, drinking and sanitation, and mine site reclamation. Mines also lose a substantial amount of water to system and evaporation losses. For that reason, the goals of the AMCP are to: (1) minimize system and evaporation losses; (2) reduce overall water consumption; (3) encourage recycling and reuse of process water; and (4) promote use of alternative water supplies (e.g., Central Arizona Project water and municipal effluent) to offset groundwater use.

While regulated under the AMCP, a mining facility must comply with the **general industrial conservation requirements**, provide **an annual Water Conservation Report** to the Department, and choose and implement at least two BMPs from each of the six BMP categories below (except where an exclusion applies).

Mining Operation Best Management Practices Program
WATER USE CATEGORY 1. DUST CONTROL
EXCLUSION: UNDERGROUND OPERATIONS ONLY REQUIRED TO CHOOSE ONE BMP.
BMP 1.1 Use compaction aids like soil agglomerates to minimize the use of groundwater for dust suppression.
BMP 1.2 Use road binders or seal high-traffic roads to minimize dust production.
BMP 1.3 Reduce the number and extent of haul trips.
BMP 1.4 Convert to conveyors for material transport.
BMP 1.5 Use alternative water supplies (e.g., reclaimed process water, municipal effluent, etc.) for dust suppression.
BMP 1.6 Use of another dust control measure not in this category that reduces water use (e.g., chemical suppressants).
BMP 1.7 Reduce groundwater use for dust control covering stockpiles
BMP 1.8 Implement progressive reclamation or cover inactive tailings in a manner that minimizes the quantity of water used for dust control purposes.
BMP 1.9 Use automated systems that apply dust control based on live conditions (operating level, ore moisture content, road moisture content etc.).
WATER USE CATEGORY 2. PROCESSING & CONVEYANCE
BMP 2.1 Employ techniques to optimize tailings particle size to balance mineral recovery and reduce tailings entrainment.
BMP 2.2 Eliminate heap leaching or reduce water used for heap or dump leaching operations by prioritizing the use of delivery methods that use less water than a sprinkler delivery system (e.g., converting existing sprinkler systems to high efficiency drip or installing high-efficiency drip systems in new facilities).
BMP 2.3 Use dewatering water (e.g., underground working or open pit) for mining and metallurgical processing needs.
BMP 2.4 Use alternative water supplies (e.g., reclaimed process water, municipal effluent, etc.) for mining and metallurgical processing needs.
BMP 2.5 Eliminate or reduce pass through water within each process before passing to another process.
BMP 2.6 Keep fine process materials under control during operations by using techniques such as particle recovery and/or other methods that reduce water consumption.
BMP 2.7 Modify conveyance system or tailings thickeners to increase the density of tailings.
BMP 2.8 Convert piping to materials equal or greater in strength to high density polyethylene piping to increase density of transported tailings.
WATER USE CATEGORY 3. TAILINGS STORAGE FACILITY MANAGEMENT
EXCLUSION: THIS CATEGORY NOT APPLICABLE TO HEAP AND LEACH OPERATIONS OR OPERATIONS THAT UTILIZE DRY STACK TAILINGS.
BMP 3.1 Reduce water use by using alternative technologies that thicken or dewater tailings.
BMP 3.2 Deposit a layer of tailings immediately up-slope from the free water level in each tailings impoundment to minimize losses and improve water recovery.

BMP 3.3 Deposit tailings in a manner that minimizes the free water surface area in each tailings impoundment to optimize/increase the rate of recovery of decant water from the stilling basins.
BMP 3.4 Increase water recovery by installing drains in the tailings storage facility.
WATER USE CATEGORY 4. REDUCE SYSTEM AND EVAPORATION LOSSES
BMP 4.1 Visually inspect water distribution systems monthly for leaks to ensure leaks are promptly identified and repaired.
BMP 4.2 Conduct a comprehensive inspection or audit of water storage and distribution systems every three years, assess opportunities for upgrades and evaluate preventative maintenance options.
BMP 4.3 Use of low-volume spray nozzles on conveyors and chutes.
BMP 4.4 Redesigned bin liners and chutes that minimize spillage and water waste at ore processing facilities.
BMP 4.5 Keep filters on recycled water pumps clean from scale build-up and debris to increase pump efficiencies.
BMP 4.6 Separate metering of freshwater and reclaimed systems.
BMP 4.7 Reduce unregulated evaporation losses through use of covers, or other evaporation controls on open water reservoirs, sumps, etc.
BMP 4.8 Reduce evaporation losses by using high-efficiency drip systems on leach pads.
BMP 4.9 Use a chemical suppressant on the tailings surface to minimize the wetted surface area and subsequent evaporation.
BMP 4.10 Angle exhaust on haul trucks so it is not pointed at ground, to reduce evaporation from haul roads.
BMP 4.11 Maintain a site water balance to assist in prioritizing conservation and reuse efforts.
BMP 4.12 Measure evaporation losses (evaporation buoys) in conveyance systems and mitigate these losses in a manner consistent with reasonable economic return.
WATER USE CATEGORY 5. COOLING SYSTEMS
BMP 5.1 Use of adiabatic cooling system for cooling towers
BMP 5.2 Use high efficiency motors for cooling systems.
BMP 5.3 Increase cooling cycles (For example if current cycle is three, increase from three to six) or optimize existing high-efficiency cooling systems.
BMP 5.4 Do not use water for single pass cooling or heating purposes unless the water is reused for other purposes.
BMP 5.5 Recycle cooling water for other purposes.
WATER USE CATEGORY 6. RECYCLED AND RECLAIMED WATER
BMP 6.1 Install a water treatment unit to reuse water for processing
BMP 6.2 Harvest and reuse storm water runoff on site.
BMP 6.3 Install gray water systems for on-site use.
BMP 6.4 Reuse water recovered from the tailings storage facility drains or recovered from high-efficiency tailings thickeners within the mining facility.
BMP 6.5 Drill interceptor wells down-gradient from each tailings impoundment. The interceptor wells shall be designed, located, and operated in such a manner as to intercept the maximum amount of seepage water possible from each tailings impoundment to be reused at the mining facility.

BMP 6.6 For post-1984 mining facilities design and construct tailings impoundments to maximize recovery of water from the stilling basins and to minimize seepage water. Any interceptor wells down gradient of tailings impoundments shall be constructed to maximize recovery of seepage water.
BMP 6.7 For pre-1985 facilities, expand decant tower barge pumping capacity where necessary to increase the capacity to recycle water from each tailings impoundment back to the mill concentrator.
BMP 6.8 For post-1984 facilities, use decant towers, barge pumps, or sump pumps to recycle water from each tailings impoundment back to the mill concentrator.
BMP 6.9 Utilize multiple decant towers or reclaim pumps in single impoundments to increase decant/reclaim rate.
BMP 6.10 Reuse, to the maximum extent possible, tailings impoundment water, rather than pumping additional groundwater.
BMP 6.11 Develop an Alternative Water Supply Analysis (including source and volume) potentially available to the metal mining operation

Proposed Revision to Definition of “large-scale metal mining and processing facility”

7. “Large-scale metal mining and processing facility” means an industrial facility at which mining and processing of metallic ores is conducted **that uses groundwater**, and that uses or has the potential to use more than 500 ac-ft of water per reporting year. For the purposes of this definition, the annual water use or potential annual water use includes all water from any source, including reclaimed water, used or projected to be used within or by the facility, regardless of the nature of the use.