

Cactus Mine  
Aquifer Protection Permit No. P-513324  
Place ID 2833, LTF No. 86457

**I. Introduction:**

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an Aquifer Protection Permit (APP) for the subject facility that covers the life of the facility, including operational, closure, and post-closure periods unless suspended or revoked pursuant to Arizona Administrative Code (A.A.C.) R18-9-A213. The requirements contained in this permit will allow the permittee to comply with the two key requirements of the Aquifer Protection Program: 1) meet Aquifer Water Quality Standards (AWQS) at the Point of Compliance (POC); and 2) demonstrate Best Available Demonstrated Control Technology (BADCT). BADCT's purpose is to employ engineering controls, processes, operating methods or other alternatives, including site-specific characteristics (i.e., the local subsurface geology), to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer or to prevent pollutants from reaching the aquifer.

**II. Permittee & Facility Location:**

Elim Mining (USA) Inc.  
22580 W. Maricopa/Casa Grande Highway  
Casa Grande, Arizona 85193

**III. Facility Description:**

The proposed Cactus Mine is an existing mine site that was formerly operated by ASARCO. The site is located approximately 6 miles northwest Casa Grande in Pinal County, Arizona. The scope of the project is to transfer material from the existing waste rock dump on a double-lined heap leach pad measuring approximately 110 acres. The existing waste rock dump (WRD) was created through dumping of waste material on bare ground consisting of alluvium. The waste material is comprised of rock that was excavated from the historical Sacaton open pit mine operated by ASARCO during the period 1974 to 1984. All oxide copper mineralization, and sulfide copper mineralization below the working grade control cutoff of 0.3% copper (Cu), as well as non-mineralized Gila Conglomerate from the west and east sides of the open pit, was deposited on the WRD. During ASARCO's operating period, the material placed in the existing WRD was of low grade and oxidized copper resources that were not considered suitable for processing in their copper floatation mill. Elim plans to leach the WRD (stockpile) materials and process the pregnant leach solution in a solvent extraction/electrowinning (SX/EW) facility to be constructed as part of this project.

Approximately 35 million tons (MT) of material from the stockpile will be placed on the lined leach pad at the rate of approximately 30,000 tons per day. The leach pad will be irrigated with a leach solution at the rate of 3,334 gallons per minute (gpm).

Leach solution from the Raffinate Pond will be pumped to the top of the Heap Leach Pad and dispersed by either drip lines, sprinkler heads (wobblers) or a combination of both. The solutions will percolate through the Heap Leach Pad and once it comes in contact with the liner at the bottom of the Leach Pad it will follow the contour of the liner and directed via a channel to the Pregnant

Leach Solution (PLS) Pond. At this point the solution will either be sent back to the Heap Leach Pad, if the copper grade is not adequate, or the solutions will be pumped by HDPE pipeline to the Stripper Units at the Electrowinning Plant if the copper grade is adequate. Once the copper is stripped the solution will be pumped to the Raffinate Pond. From the Raffinate Pond the solution will be re-acidified and pumped to the top of the Heap Leach Pad to start the process again.

**IV. Amendment Description:**

Not applicable.

**V. Regulatory Status**

Not applicable.

**VI. Best Available Demonstrated Control Technology (BADCT):**

The APP includes the following facilities:

- A 60-mil double-lined heap leach pad with collection channels located to the east, west, and the south.
- A 60-mil double-lined PLS Pond.
- A 60-mil double-lined Raffinate Pond.
- A 60-mil double-lined Event Pond.

BADCT description for each of the above facilities is provided in Table 7 of the APP.

**VII. Compliance with Aquifer Water Quality Standards (AWQS):**

**Pollution Management Area (PMA)**

The PMA is described in A.R.S. §49-244(1) as (1) the limit projected in the horizontal plane of the area on which pollutants are or will be placed, (2) horizontal space taken up by any liner, dike or other barrier designed to contain pollutants in the facility, and (3) an imaginary line circumscribing the several discharge activities if a facility contains more than one discharging activity. The PMA at the Cactus Mine circumscribes the Heap Leach Pad, PLS Pond, Raffinate Pond, and Event Pond.

**Discharge Impact Area (DIA)**

The DIA, as defined by A.R.S. §49-201.13, is the potential aerial extent of pollutant migration, as projected on the land surface, as the result of a discharge from a facility. Groundwater modeling was conducted to project the DIA during 30-years of operation followed by 20-years post mine closure. The simulated flow conditions after 50-years do not show significant change relevant to the 2019 pre-operational flow regime. Groundwater flow beneath the site is primarily controlled by the mining related features on the property. For example, groundwater flows radially towards the open mine pit in the northeastern corner of the property. Whereas flow directions change relative to the observed groundwater mounding beneath the TSF and WRD facilities located in the northwestern and southeastern corners of the property, respectively. In general, these features appear to have a significant impact on the observed northwest and southwest flow components beneath the site.

The Heap Leach Pad and pond impoundments will be lined and designed to adhere to BADCT. The water pumped from the open pit and underground workings will be diverted to the Heap Leach Pad, where flow will be controlled and contained within the BADCT designed facility. Therefore, the DIA will coincide with the PMA.

**Point(s) of Compliance:**

There are 3 POC wells situated along the perimeter of the PMA boundary in accordance with A.R.S. § 49-244. The APP requires both quarterly and semi-annual compliance monitoring of hazardous and non-hazardous constituents at all POC locations. Monitoring parameters are provided in Section 4.2, Tables 11 and 12 of the APP.

**Discharge Monitoring**

No routine discharge monitoring is required under this permit. One-time discharge characterization of the PLS Pond and Raffinate Pond shall be done within 180 days after commencement of leaching operations. Results of the discharge monitoring shall be submitted to the Groundwater Protection Value Stream within 30 days from receipt of the laboratory analytical results. Operational monitoring of the Heap Leach Pad, PLS Pond, Raffinate Pond, and Event Pond will be required including liner integrity and freeboard.