

Freeport-McMoRan Morenci Operations  
Aquifer Protection Permit No. P-100193  
Place ID 2512, LTF No. 90007  
Significant Amendment

**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:**

Freeport-McMoRan Morenci Inc.

**III. Facility Name & Location:**

Morenci Mine  
4521 U.S. Highway 191  
Morenci, Arizona 85540

**IV. Facility Description:**

This facility is one of the largest open-pit copper mines in the world. The mine and supporting operations cover an area of approximately 72 square miles. Copper has been actively mined from the Morenci District since the late 1800s. The current Morenci operation includes an open pit with several mining areas, leach operations, and a tailings deposition area. Copper and molybdenum concentrates are produced through conventional milling and froth flotation processes. Cathode copper is produced through solution extraction and electrowinning (SX/EW) processes, and through the concentrate leach process. Gold and silver concentrates are also produced as minor components in the copper concentrate. According to the APP application, submitted in March 1996, approximately 850,000 tons of rock per day are mined from the Morenci open-pit mining areas, and between 2,000 and 2,500 tons of copper concentrate, and about 650 tons of cathode copper, are produced per day.

There are a total of 112 APP discharging facilities consisting of tailings impoundments, process solutions impoundments, non-stormwater impoundments, leach stockpiles, vehicle wash facilities, a wastewater treatment plant, and miscellaneous facilities. A list of the facilities is provided in Section 2.1 of the APP.

## V. Amendment Description:

The purpose of the amendment is to permit three new APP discharging facilities, four new point of compliance (POC) wells, remove a hydrologic sink monitoring well, and update the closure and post-closure cost estimates.

The new facilities added to the permit include:

1. Producer Leach Stockpile
2. Producer PLS Impoundment
3. Producer Process Water Impoundment

FMMI proposed four additional point of compliance (POC) wells namely GG-30, GG-32, GG-33, and GG-34.

Groundwater monitor well GG-06 was removed from the permit. This well was not a designated POC well, but rather monitored groundwater elevation and quality as part of the hydrologic sink verification. Due to the construction of the Silver Basin Leach Stockpile (permitted in 2015), this well was abandoned in February of 2020. The hydrologic sink is still being monitored in the vicinity by groundwater well GG-15.

The closure and post-closure cost estimates were increased from \$271,864,224 to \$656,055,224 and from \$86,396,131 to \$92,324,691 respectively. The total cost estimates were increased from \$358,260,355 to \$748,379,915, and the Net Present Value (NPV) cost was increased from \$194,406,115 to \$311,205,115.

The permittee shall provide an updated financial capability for the estimated NPV amount of \$311,205,115 as per the compliance schedule in Section 3 of the permit. In addition, a corporate guarantee in the undiscounted (no NPV) amount of \$8,856,342, was previously submitted under LTF No. 74213.

### Rationale for Amendment Category:

The permit amendment is for the addition of a new leach stockpile and two impoundments. Therefore, the amendment category is a Significant Amendment as per A.A.C. R18-9-A211(B)(1):

*“Part or all of an existing facility becomes a new facility under A.R.S. § 49-201;”*

## VI. Regulatory Status

Currently, there are no open enforcement actions for this facility.

## VII. Best Available Demonstrated Control Technology (BADCT):

As discussed in the “Amendment Description” section above, three new APP discharging facilities: Producer Leach Stockpile, Producer PLS Impoundment, and Producer Process Water Impoundment, were added to permit.

The Producer Leach Stockpile will be developed using Individual BADCT method. The stockpile will fill all or parts of the Gold Gulch, West Gold Gulch, East Gold Gulch and Pinkard Gulch drainages and will extend from the Gold Gulch/Pinkard Gulch confluence in the southwest to the

existing Producer Development Rock Stockpile (exempt facility) to the north. The foundation of the stockpile will be partially lined along the major channels with geomembrane for slopes 10% or less and spent mine-for-leach (MFL) ore for slopes greater than 10% to as high as 30%. The maximum crest elevation of the stockpile is 5,875 ft above mean seal level (amsl).

The Producer PLS Impoundment and the Producer Process Water Impoundment will be constructed using Prescriptive BADCT method. The ponds will be double-lined with 100-mil HDPE with a leak collection and removal system. The ponds shall maintain 2 feet freeboard. Solutions from these ponds will be pumped to the Modoc and Metcalf SX Plants for processing.

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

The Pollutant Management Area (PMA) was updated under this amendment to include the Producer Leach Stockpile facilities. The Discharge Impact Area (DIA) is contiguous with the PMA, and also includes the new facilities proposed in this amendment.

The application in support of this amendment identified the quantity and characteristics of the potential discharge from the Producer Leach Stockpile facilities as well as the method of discharge control and site-specific conditions to demonstrate BADCT (see section VII above). The application also included a hydrogeologic study and a numerical groundwater model to evaluate the effectiveness of downgradient interceptor wells in providing hydraulic containment. All of the information submitted in the application supports the demonstration and conclusion that no pollutants discharged from the Producer Leach Stockpiles facilities will (1) cause or contribute to a violation of AWQS at the applicable POCs, or, (2) further degrade at the applicable POCs the quality of any aquifer that at the time of permit issuance violates the AWQS for a particular pollutant.

Further, groundwater monitoring is required at the POC wells listed in Table 9 of the APP to ensure compliance with A.R.S. 49-243(B)(2) and (3). Additionally, the groundwater monitoring requirements are described in Tables 11 through 14. Ambient groundwater monitoring as described in Table 10 will be performed for the new POC wells listed above (GG-30, GG-32, GG-33, and GG-34).