

Freeport-McMoRan Morenci Operations
Aquifer Protection Permit No. P-100193
Place ID 2512, LTF No. 74213
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 & Facility Location:

Freeport-McMoRan Morenci Inc.
4521 U.S. Highway 191
Morenci, Arizona 85540

III. 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 114 APP discharging facilities consisting of tailing 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.

IV. Amendment Description:

The purpose of this amendment is for the construction of four new facilities (Morenci Canyon Stockpile, MRC PLS Pond, MRC Process Pond, and SB PLS Pond), and modifying the BADCT description for the existing facility (Silver Basin Leach Stockpile) to reflect design modifications and accommodate Phase 4.

V. Regulatory Status

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

VI. Best Available Demonstrated Control Technology (BADCT):

BADCT descriptions for the APP facilities are provided in Section 4.0, Table 2 of the APP. A significant component of BADCT employed at the Morenci Mine is the passive containment of groundwater in the vicinity of the open pit mining areas (see following Section VII). Below is a summary of the number and types of APP facilities:

- Eight (8) Tailings Facilities [there are six (6) Tailings Stormwater Ponds (TSPs) and six (6) Seepage Collection Ponds (SCPs) located within the footprint of the tailings facilities]
- Thirty one (31) Non-stormwater Impoundments
- Eighteen (18) Process Solution Impoundments outside the Passive Containment Capture Zone (PCCZ)
- Nine (9) Process Solution Impoundments within the PCCZ
- Seven (7) Leach Stockpiles outside the PCCZ
- Fourteen (14) Leach Stockpiles within the PCCZ
- Two (2) Leach Stockpiles Partially within the PCCZ
- One (1) Wastewater Treatment Plant
- Four (4) Vehicle Wash Facilities within the PCCZ
- Three (3) Vehicle Wash Facilities outside the PCCZ
- Four (4) Miscellaneous Facilities outside the PCCZ

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

The permittee has demonstrated that the open pit mine will create a passive containment, as described in Arizona Revised Statutes § 49-243(G). The hydrologic sink will therefore provide pollutant capture for those facilities located within the PCCZ during operations and after closure. For facilities located outside the PCCZ, the permittee will rely on engineering and operational factors to maintain compliance with AWQS at the POCs.

There are 20 designated POC wells at the Morenci Mine; all monitor for both hazardous and non-hazardous substances (see Table 4). The APP requires quarterly monitoring at all POC locations. The parameters to be monitored are listed in Table 5 of the APP. In addition, an expanded list of parameters is required to be monitored biennially (See Tables 7.A, 7.B, and 7.C). The ALs and AQLs are listed in Tables 6, 7.A, 7.B, and 7.C. The ALs and AQLs are calculated in accordance with the memorandum “Proposed Approach for the Calculation of Alert Levels” prepared by Dames & Moore, dated May 5, 2000, as allowed in the APP, Section 2.5.2.3.

Two conceptual POC wells were added in relation to the new Morenci WWTP, and the expansion in the Los Taos area.