



# Fact Sheet

Aquifer Protection Permit  
Place ID 5425, LTF 47813  
Significant Amendment  
Freeport McMoRan Safford, Inc.

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an aquifer protection permit other amendment 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. This document gives pertinent information concerning the issuance of the permit. 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.

## I. FACILITY INFORMATION

### Name and Location

Permittee's Name:	Freeport McMoRan Safford, Inc.
Mailing Address:	P.O.Box 1019 Safford, Arizona 85548
Facility Name and Location:	8500 N. Phelps Dodge Road Safford, Arizona 85546

### Regulatory Status

The Notice of Disposal for this site was received on January 21, 1985. The Aquifer Protection Permit (APP) Application for this site was received on October 2, 1998. It was then issued on May 18, 2006. The application for an APP, Other Amendment was received by ADEQ on March 5, 2007. It was then issued on October 23, 2007. The Arizona Pollutant Discharge Elimination System (AZPDES) permit for this site, number AZ0024309, was issued on April 13, 2004. The application for this APP, Significant Amendment was received by ADEQ on June 10, 2008.

### Facility Description

The Dos Pobres/San Juan Project area is located in Graham County, Arizona, approximately 8 miles north of the Town of Safford, in the foothills of the Gila Mountains. The project is located on Phelps Dodge patented land. The plans for this site involve open-pit copper mining on the Dos Pobres and San Juan properties, and leaching of the ore on a lined leach pad. The resulting pregnant leach solution will be

processed at an on-site solvent extraction/electrowinning (SX/EW) plant. The project will consist of the development of two open pits, one heap leach pad, one process solution impoundment, two non-stormwater impoundments, a SX/EW process plant, and infrastructure and support facilities associated with copper mining with a truck and wheel wash facility. Domestic wastewater discharges will be authorized separately under Type 4 general APPs. This permit authorizes the operation of the discharging facilities described below:

### **Heap Leach Pad (PAD)**

This facility will be utilized for the storage and leaching of copper ore and other solid, copper-bearing materials, including sediment and wash water generated from the mine vehicle wash facilities. The pad will have an area of approximately 748 acres, with an ultimate height of the ore pile of up to 600 feet above the liner surface. It will be lined by a Linear Low Density Polyethylene (LLDPE) geomembrane liner, constructed over a prepared subgrade of compacted low permeability soil. The LLDPE geomembrane will vary in thickness with an 80-mil-thick liner material within the center area of the pad. A 60-mil-thick (minimum) liner material shall underlie the slopes of the stockpile. Raffinate will be applied to the ore pile, with the resulting leachate being collected in a series of leachate collection pipes installed on top of the geomembrane liner. The collection pipes will be protected by approximately 24 inches of 1.5-inch crushed aggregate material. Pregnant leach solution (PLS) will be routed through the collection pipe system into a stainless steel PLS tank at the downgradient edge of the pad, and from there to the SX/EW process plant.

### **Excess Process Solution Impoundment (EPSI)**

This impoundment is designed to capture excess solution and stormwater from the PLS tank and from the Heap Leach Pad. It has a design capacity of 15 million gallons. It will be double-lined, with a leakage collection and recovery system. The primary liner is a minimum 80-mil high density polyethylene (HDPE). The secondary (bottom) liner is a 60-mil HDPE composite liner. Collected fluid will be pumped to the PLS tank, SX/EW Plant, or back into the operations cycle. Overflow will pass through an HDPE lined channel into the Non-stormwater Impoundment.

### **Non-stormwater Impoundment (NSI)**

This impoundment will receive overflow through the spillway from the Excess Process Solution Impoundment. It will have a composite liner consisting of a minimum 60-mil HDPE liner in the general impoundment area overlying a minimum 6 inches of 3/8 inch minus bedding soil, compacted to 95 percent maximum dry density, and a 100-mil HDPE liner in the area of pump operation. The total storage capacity at the emergency spillway elevation will be 430 acre-feet, with a maximum depth below the spillway of 47.5 feet. Accumulated fluid will be pumped back into the operations cycle. Potential discharges from the Non-Stormwater Impoundment to nearby receiving waters named Talley Wash are addressed under the terms and provisions of an individual AZPDES permit (Permit No. AZ0024309).

### **San Juan Non-stormwater Evaporation Impoundment (SJNEI)**

This impoundment captures stormwater and seepage from the historic San Juan leach stockpiles. The impoundment is an existing unlined facility that will be upgraded with a composite liner system consisting of a 60-mil HDPE liner over 6 inches minimum thickness of compacted low permeability clay. The maximum storage capacity of the impoundment will be 7.7 acre-feet at the crest elevation.

Seepage is collected in a lined intercept trench equipped with six reclaim wells, located downgradient of the stockpiles and upgradient of the impoundment, from which water is pumped into the impoundment. Accumulated fluid in the impoundment is evaporated.

### **Amendment Description**

The permit amendment is being initiated by Phelps Dodge Safford, Inc. to request the addition of a truck wash and a wheel wash facility. The permit is being amended to allow the deposition to the Leach Pad of truck wash sediments and water as well as sulfuric and petroleum contaminated soils resulting from accidental spills. The volume of sediment and wash water generated annually by the truck and wheel wash facilities is estimated to be 2,250 tons of sediment and 225,000 gallons of water.

## **II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY**

Four major facilities, in two pollutant management areas/discharge impact areas, are permitted:

The PAD area, southwest of the Dos Pobres Pit, remains to be constructed. This area will include mining of the Dos Pobres pit, and the construction of the PAD system, SX/EW facility, and associated infrastructure. The three individually permitted facilities at this location will be constructed to meet prescriptive BADCT.

The PAD shall be constructed using a composite liner system over a prepared subgrade. The composite liner system design shall consist of a 60-mil LLDPE geomembrane underlain by a minimum of 12 inches of compacted 3/8-inch minus, low permeability soil (hydraulic conductivity no greater than  $10^{-6}$  cm/sec). The geomembrane shall be covered by approximately 24 inches of nominal 1-inch crushed material, overlying a network of leachate collection pipes laid on top of the geomembrane. The geomembrane shall be secured by an engineered trench. The PAD footprint consists mainly of slopes ranging from less than 10:1 to 3:1 (H:V). Surface water run-on from the 100-year, 24-hour storm event shall be diverted around the operational phase of the facility. The design and construction details of the PAD, approved by ADEQ, are contained in the APP application, dated October 1998.

The EPSI is designed to contain the seepage from the PAD, collected through a system of leachate collection pipes. The impoundment shall be constructed using a

double liner, incorporating a leakage collection and recovery system (LCRS). The primary liner shall be 80-mil HDPE which shall overlie a geonet for the rapid collection of leakage through the primary liner. The geonet and LCRS shall be underlain by a 60-mil HDPE secondary liner. The secondary liner shall be a composite liner placed directly over a minimum 12-inch layer of compacted 3/8-inch minus soil underliner with a saturated hydraulic conductivity no greater than  $10^{-6}$  cm/sec. The design and construction details of the EPSI approved by ADEQ, are contained in the APP application, dated October 1998. The impoundment has a minimum of 2 feet of embankment above the spillway elevation. The impoundment has been divided into two cells to facilitate selective usage during facility operation. Each cell has a capacity for a maximum of 12.5 million gallons of process solution and stormwater. The spillway for the impoundment is designed to pass the peak flow from the 100-year, 24-hour storm event plus operational flow at 241 cubic feet per second, with a minimum of 11 inches of freeboard. Overflow from the impoundment will be conveyed through the HDPE lined channel and concrete lined inlet structure to the NSI.

The NSI is designed with a composite liner system that consists of a single 60-mil HDPE geomembrane overlying a minimum of 6 inches of 3/8-inch minus bedding soil compacted to 95 percent maximum dry density. The impoundment receives fluid overflow from the spillway of the EPSI through an HDPE-lined channel and concrete inlet structure. The design and construction details of the NSI, including the overflow channel and inlet structure, approved by ADEQ, are contained in the APP application, dated October 1998. Storage capacity of the impoundment is approximately 390 acre-feet at an elevation 2 feet below the emergency spillway, and shall be 430 acre-feet at the emergency spillway elevation. The impoundment is designed to accommodate the 100-year, 24-hour storm event plus process upset flows during a 24-hour power outage, with a minimum of 2 feet of freeboard. The maximum depth of the impoundment below the emergency spillway is approximately 34 feet, with the crest of the embankment 5 feet above the emergency spillway elevation. The stormwater from the impoundment will report to the raffinate tanks through an outlet HDPE pipe via gravity.

The San Juan area stockpiles will be moved to the new PAD for reprocessing. The remaining ore reserves in the San Juan Pit will be mined and processed during the leaching operations. A Truck Shop Complex will be constructed in the area. The one individually permitted facility at this location will be upgraded to meet individual BADCT.

The existing SJNEI was an unlined existing facility that is upgraded with a composite liner system consisting of 60-mil HDPE geomembrane over 6 inches (minimum thickness) of compacted low permeability soil (clay). The impoundment liner is extended into the upgradient gravel-filled trench to capture any shallow, subsurface seepage from the historic San Juan leach stockpiles. The intercept trench, excavated into competent bedrock, is lined on the downgradient face with 60-mil HDPE geomembrane, with a 10-ounce geotextile placed above and underneath the

geomembrane. Seepage collected from the intercept trench by six upgradient reclaim wells is pumped into the impoundment and allowed to evaporate. Each well is equipped with an automatic pump to discharge a maximum of 3 gallons per minute into the impoundment. The impoundment is designed to contain the surface water run-on generated from the 100-year, 24-hour storm event. A “witness” drain is installed underneath the geomembrane liner to detect leakage through the liner. To capture any seepage from the evaporation impoundment, the seepage collection system shall be installed downgradient of the impoundment. The seepage collection system shall consist of a concrete intercept curb and an HDPE lined concrete sump placed in bedrock. The sump shall be equipped with an automatic pump to transfer solution from the sump to the SJNEI. The design and construction details of the facility upgrades, approved by ADEQ, are contained in the APP application, dated October 1998. The impoundment shall have a storage capacity of 5.4 acre-feet, with a minimum of 2 feet of freeboard. The maximum storage capacity of the impoundment at the crest elevation is 7.7 acre-feet.

BADCT in both of the described areas is supplemented by a required inspection and maintenance program, and groundwater monitoring at the applicable POCs.

### **III. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS**

#### **Monitoring and Reporting Requirements**

Seven additional POC wells are required to be installed in the PAD area 12 months prior to the startup of leach operations. Two POC wells are already installed in the future PAD area. One existing POC is located downgradient of the SJNEI. The permit requires 12 consecutive months of monitoring to establish alert levels and aquifer quality limits at the POC. Once these limits are established, a biennial expanded list, along with a quarterly reduced list, of constituents are required to be monitored at the ten POC wells.

The quarterly monitoring list is composed of the following constituents: Depth to water, water level elevation, field pH, field specific conductance, field temperature, copper, beryllium, cadmium, cobalt, nickel, selenium, fluoride, magnesium, nitrate plus nitrite as N, sulfate, and total dissolved solids.

The biennial monitoring list is composed of the following constituents: Depth to water, water level elevation, field pH, field specific conductance, field temperature, total dissolved solids, total alkalinity, carbonate, bicarbonate, hydroxide, chloride, sulfate, sodium, potassium, calcium, magnesium, nitrate plus nitrite as N, fluoride, aluminum, antimony, arsenic, beryllium, barium, cadmium, chromium, iron, lead, nickel, selenium, thallium, copper, cobalt, manganese, zinc, gross alpha particle activity, radium 226 plus radium 228, total uranium, benzene, toluene, ethylbenzene, total xylene, and total petroleum hydrocarbons.

The depth to water at the site varies in relation to the northwest trending Butte fault. North of the fault, the depth to water ranges from near the surface in the vicinity of

springs, to greater than 500 feet below ground surface (bgs). The measured depth to water exceeds 400 feet in some wells, but is typically less than 300 feet bgs. South of the fault, measured depth to groundwater typically is 600 to greater than 800 feet bgs in wells directly south of the fault, to less than 100 feet bgs in the southwestern part of the project area.

Depth to water in the two existing POC wells in the vicinity of the future PAD (POC # 2 and POC # 8) was measured at 634 feet bgs (3/1998) and 522 feet bgs (2/1998), respectively. The depth to water in the existing POC well in the vicinity of the SJNEI (POC # 10) was measured at 12 feet bgs (1/1998).

The nearest downgradient wells not owned by Phelps Dodge are located approximately 4.5 miles southwest of the proposed PAD.

**Points of Compliance**

WELL ID	ADWR REGISTRATION NUMBER	CADASTRAL LOCATION	LATITUDE	LONGITUDE
POC No. 1	None	D(6-26)3bdb	32° 56' 33" N	109° 40' 32" W
POC No. 2 (AP-22)	55-556053	D(5-26)4dac	32° 56' 11" N	109° 41' 02" W
POC No. 3	None	D(6-26)9abc	32° 55' 48" N	109° 41' 23" W
POC No. 4	None	D(6-26)9cbb	32° 55' 26" N	109° 41' 50" W
POC No. 5	None	D(6-26)8add	32° 55' 34" N	109° 42' 03" W
POC No. 6	None	D(6-26)5ddc	32° 55' 58" N	109° 42' 09" W
POC No. 7	None	D(6-26)5dba	32° 56' 19" N	109° 42' 18" W
POC No. 8 (AP-11)	55-556049	D(5-26)32dcc	32° 56' 51" N	109° 41' 55" W
POC No. 9	None	D(5-26)33cbb	32° 57' 09" N	109° 41' 27" W
POC No. 10 (AP-25)	55-556055	D(6-26)2dbb	32° 56' 15" N	109° 39' 15" W

POCs 1 through 9 are located in the vicinity of the leach pad impoundment, southwest of the Dos Pobres Pit. POC 10 is located downgradient from the San Juan Pit, historical stockpiles, and SJNEI.

**IV. STORM WATER AND SURFACE WATER CONSIDERATIONS**

The site is located within the Gila River basin. A perennial reach of the Gila River is located approximately five miles south of the project area. The project area is dissected by several southwest flowing ephemeral tributaries of the Gila River, including Watson Wash, Talley Wash, Cottonwood Wash, and Peterson Wash. Four springs are located upslope of the project area.

A series of diversion channels and dams will divert stormwater runoff around the permitted facilities. All permitted facilities are designed to contain the precipitation falling on the facility from the 100-year, 24-hour storm event, with a 24-hour power outage, and still maintain appropriate freeboard. An AZPDES permit has been issued for the Talley Wash area, in the vicinity of the PAD.

## V. COMPLIANCE SCHEDULE

- The compliance schedule regarding point of compliance wells and construction requirements is displayed in Section 4, Table 4.4.1 of the permit.
- Prior to the startup of heap leach operations, the applicant shall submit for ADEQ approval a contingency plan that meets the requirements of A.A.C. R18-9-A204. Startup of heap leach operations is defined as the first placement of acidified ore on the leach pad.
- Financial Capability is to be provided pursuant to A.A.C. R18-9-A203 upon transfer from Phelps Dodge Safford Inc to Freeport-McMoRan Copper and Gold Inc. within 1 year of the previous permit issuance.

## VI. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT

### **Technical Capability**

Phelps Dodge Safford, Inc. has demonstrated the technical competence necessary to carry out the terms and conditions of the permit in accordance with A.R.S. § 49-243(N) and A.A.C. R18-9-A202(B).

ADEQ requires that appropriate documents be sealed by an Arizona registered geologist or professional engineer. This requirement is a part of an on-going demonstration of technical capability. The permittee is expected to maintain technical capability throughout the life of the facility.

### **Financial Capability**

Phelps Dodge Safford, Inc has demonstrated financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203 and as amended. The permittee shall maintain financial capability throughout the life of the facility. The estimated closure and post-closure costs are \$1,065,900 and \$240,875 per year, respectively. The financial capability was demonstrated through A.A.C. R18-9-A203(C)(8).

### **Zoning Requirements**

Phelps Dodge Safford, Inc has been properly zoned for the permitted use and the permittee has complied with all Graham County zoning ordinances in accordance with A.R.S. § 49-243(O) and A.A.C. R18-9-A201(B)(3).

## **VII. ADMINISTRATIVE INFORMATION**

### **Public Notice (A.A.C. R18-9-108(A))**

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft permit or other significant action with respect to a permit or application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit. This permit will be public noticed in a local newspaper after a pre-notice review by the applicant and other affected agencies.

### **Public Comment Period (A.A.C. R18-9-109(A))**

The aquifer protection program rules require that permits be public noticed in a newspaper of general circulation within the area affected by the facility or activity and provide a minimum of 30 calendar days for interested parties to respond in writing to ADEQ. After the closing of the public comment period, ADEQ is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

### **Public Hearing (A.A.C. R18-9-109(B))**

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if the Director determines there is a significant amount of interest expressed during the 30-day public comment period, or if significant new issues arise that were not considered during the permitting process.

## **VIII. ADDITIONAL INFORMATION**

Additional information relating to this proposed permit may be obtained from:

Arizona Department of Environmental Quality  
Water Quality Division – APP & Drywell Unit  
Attn: Steven Vevang  
1110 W. Washington St., Mail Code: 5415B-3  
Phoenix, Arizona 85007  
Phone: (602) 771-4621