

## 9.0 GROUNDWATER PROTECTION

The Rosemont Project will be covered under the ADEQ APP permit process. This requires that facilities be constructed, operated, and maintained so that aquifer water quality standards (AWQS) are not violated, as monitored at the applicable point of compliance. Alternatively, if ambient water quality is already above the AWQS, no additional degradation of the aquifer relative to the pollutant may occur, again as monitored at the point of compliance. The Rosemont facilities are being designed to meet the standards of prescriptive Best Available Demonstrated Control Technology (BADCT) under the Aquifer Protection Program (APP) process and therefore will be protective of water quality during operations and at closure.

Because there has been little drilling associated with determining the background water quality at the site, the actual standards for groundwater compliance are not known at this point. Once the point of compliance monitoring wells are installed, Augusta will work with the State of Arizona to set protective standards.

### 9.1 Waste Rock

Approximately 70% of the waste rock material tested to date can be defined as inert based on the ADEQ draft policy titled "*Policy for the Evaluation of Mining Rock Materials for the Determination of Inertness*." Testing is currently on-going to understand the potential for metals to leach from any acid generating or potentially acid generating materials. Humidity cell and precipitation leach testing results performed to date have not exhibited elevated concentrations of metals and major ions (*Baseline Geochemical Investigation*, Tetra Tech, June 2007).

### 9.2 Tailings Disposal

Dry tailings disposal will be employed at the Rosemont site. This method places tailings at moisture contents ranging from 10 to 15% by weight. During placement, the tailings are anticipated to dry out to an average moisture content of 6%. Based on preliminary results of seepage modeling, the tailings material will be dry enough to prevent any downward flow to the alluvial material located below the facility (*Dry Stack Tailings Report*, Tetra Tech, June 2007). Groundwater level conditions in the general area are anticipated to be about 100 feet below the existing ground surface, though groundwater levels observed within the floodplain of the Barrel drainage range from 46 to 81 feet below ground surface.

### 9.3 Leach Facilities

The ponds and heap leach pad facilities will meet the prescriptive BADCT requirements for these types of facilities as regulated by ADEQ. Specific operating controls as found in ADEQ's BADCT guidance manual were included in the designs (*Leaching Design Report*, Tetra Tech, June 2007). These design parameters include:

- Three feet of operating freeboard.
- Double-lined process ponds placed on a geosynthetic clay liner (GCL) with leak detection.
- Stormwater overflow to a lined facility capable of managing a 100-year, 24-hour storm event with three feet of freeboard.
- Lined leach pad placed on GCL with associated piping and drain fill to insure low hydraulic heads on the liner.

#### **9.4 Open Pit**

The hydrogeology and geochemistry of the open pit are being investigated to determine if passive containment will be achieved and to determine the resultant water quality. Modeling is planned for this facility to verify the appropriate management and permitting scenario. Testing and analyses performed to date indicate limited potential for material exposed in the pit walls to generate acid.

#### **9.5 Groundwater Monitoring**

Proposed point of compliance monitor wells (designated as Rosemont Project, or RP wells), as described in ARS §49-244.2, are shown in Figure 34. In addition to the RP wells, proposed hydrogeologic characterization (HC) and pit characterization (PC) wells are also shown on Figure 34. The PC wells located on Augusta land were installed in early 2007 to characterize hydrogeologic conditions in the vicinity of the pit, to monitor ambient groundwater quality, and to determine groundwater characteristics for evaluation of pit dewatering requirements. The RP and HC wells are planned to document groundwater levels, characterize ambient groundwater quality, monitor groundwater quality over time, and define the hydrogeologic characteristics of the planned operational areas.

Water quality at the facility will be monitored as required by permit. Ambient groundwater quality will be determined for each RP monitor well using a comprehensive suite of chemical analyses as required under the APP program. Following the ambient groundwater quality assessment and selection of Aquifer Quality Limits and Alert Levels, subsequent monitoring of selected indicator constituents and other parameters will be on a periodic basis as specified by permit.

The proposed Pollutant Management Area (PMA), as defined in the APP program, is shown on Figure 34. The PMA is the area in which materials and process are to be managed. Groundwater monitoring and protection is more fully discussed in the *Groundwater Protection Plan* (Tetra Tech and Errol Montgomery & Associates, June 2007).