

Ensuring Waste Rock Dumps Don't Pollute

Overburden and any rock that has no economic value but must be mined to get at the ore, is called waste rock. It is normally free-dumped near the underground portal or open pit from which it was extracted, in a designated location. The mine operator is required by the Water Pollution Control Permit to analyze (characterize) the waste rock and demonstrate that there is no potential to generate acidic water and/or metals as it comes into contact with rain or snow when left exposed. These characterization tests are recognized world-wide, are based on sound scientific practice, and must be performed by a Nevada-certified laboratory. The Meteoric Water Mobility Procedure (MWMP) is first used to determine if there is any potential for meteoric water to release metals from the waste rock. The potential for acid generation is first determined by Static Testing (also referred to as acid-base accounting or ABA) which determines acid neutralization potential (ANP) and acid generation potential (AGP). If the ANP/AGP ratio is greater than or equal to 1.2 (or 3.0 for sites on federal land), then the material is considered non-acid generating, no further testing is required for acid generation potential, and the waste rock can be placed on the surface. If the ANP/AGP ratio is less than 1.2, then Kinetic Testing (also referred to as Humidity Cell Testing or HCT) is required to investigate further the potential for acid generation and metals liberation.

The test results dictate how the waste rock is to be managed, taking into the material's relative potential to release metals and/or generate acid, specific site conditions, and ultimate placement location. The Division requires that the initial characterization results, methods to be utilized for sample collection and evaluation going forward, and proposed actions to mitigate potential acid generation and any other release of pollutants, as warranted, must be included in a waste rock and ore management plan to be submitted with the Water Pollution Control Permit application and regularly updated as required.

When the tested waste rock is determined to be potentially acid-generating and/or capable of releasing metals, the operator has several options, including the construction of a lined waste rock facility with engineered containment, the treatment of the problematic waste rock with lime or some other neutralizing agent, encapsulating the problematic waste rock with benign (non-reactive) material, and if the waste rock dump is no longer in use, the operator can also cover the problematic material with a geosynthetic liner and a soil layer to preclude infiltration of rain and snow melt water into the material. If a waste rock dump is found to be seeping low pH acidic water from the toe, the operator is required to collect the seepage in a lined basin and treat the waste rock or cover it.