

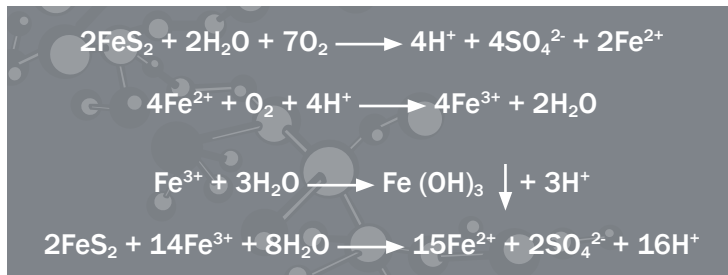
# TECHNICAL UPDATE

## AGAT Laboratories' Mining Geochemistry Services

### Acid Rock Drainage

Acid Rock Drainage (ARD) occurs when sulphide minerals (i.e. pyrite or chalcopyrite) from tailings deposits and mine rock piles oxidize with the potential of deleterious products (acid and dissolved metals) leaching into the environment.

The following reactions explain this process:



Static Tests are used to quickly determine the likelihood of these reactions occurring at a mine site. The information gathered from these analyses can lead to a more in-depth examination involving Kinetic Testing.

### Static Testing

ARD potential is often initially estimated using rapid, accurate determinations on the likelihood of a sample to exhibit characteristics of generating acid.

Acid-Base Accounting (ABA) is the analytical cornerstone for static test predictions of ARD potential. ABA methods estimate the amount of acid-bearing material by measuring either total sulfur or sulfide-sulfur. Based on this information, AGAT Laboratories reports Neutralization Potential (NP), Acid Producing Potential (APP) and Net Neutralization Potential (NNP). NNP values that are less than 20 kg CaCO<sub>3</sub>/t indicate a high probability of this sample to produce acid. NNP values that are greater than 20 kg CaCO<sub>3</sub>/t indicate that there is not a high probability of the sample to produce acid.

AGAT Laboratories is proud to be the only laboratory in Canada to be accredited to ISO 17025 by the Standards Council of Canada (SCC) for ABA procedures. Our accreditation illustrates that our analyses are being determined using established procedures and qualified analysts with results of the highest quality.

### Kinetic Testing

Kinetic Cells, also known as "Humidity Cells", involves a longer process after the initial determination of samples of interest using ABA and/or SFE analysis. Kinetic tests attempt to mimic natural oxidation during weathering conditions using a much larger sample contained in a cell and require a longer time for completion. Each cell provides detailed information on acid production and drainage water quality, which are reported on a weekly basis.

Shake Flask Extractions (SFE) can be used as a rapid means for obtaining leached elements of interest in a sample. Using our state-of-the-art ICP-MS technology, leached elements such as arsenic, selenium and mercury can be quickly obtained.