

CALENDAR

■ **Mineral Exploration Roundup 2011**

January 24 – 27, 2011
Westin Bayshore Resort & Marina
Vancouver, BC, Canada
www.amebc.ca

■ **Mining Indaba 2011**

February 7 – 10, 2011
Cape Town International Convention Centre
Cape Town, South Africa
www.miningindaba.com

■ **2011 SME Annual Meeting and Exhibit / CMA 113th National Western Mining Conference**

February 27 – March 2, 2011
Colorado Convention Complex
Denver, Colorado
www.smenet.org
Visit PAH/Runge at Booths 629 and 631

■ **PDAC 2011 – International Convention, Trade Show and Investors Exchange**

March 6 – 9, 2011
Metro Toronto Convention Centre
Toronto, ON, Canada
www.pdac.ca
Visit PAH/Runge at Booth 1523

■ **CIM Conference**

May 21 – 25, 2011
Palais des Congres of Montreal
Montreal, QC, Canada
www.cim.org
Visit PAH/Runge at Booths 6943 & 6945

Mine Buffer Zone Considerations

Introduction

One potential component of mine development is designing buffer zones to address safety, aesthetic-disturbance, environmental, and cultural issues/impacts. The following presents a very cursory summary of the purpose/types of buffer zones used in mining operations. In most cases, buffer zones are site-specific, and based on technical assessments and a risk evaluation performed by experts.

Waste Rock Dumps

Buffer zones are established around waste rock dumps primarily for safety reasons to prevent injuries to nearby residential, commercial and worker areas and infrastructure from rolling boulders, slope failure and landslides. Buffer zones are also required for surface water control such as collection channels and sedimentation ponds. The basis for a waste rock dump buffer zone is a geotechnical evaluation of the potential for a rock slide given seismicity, material involved, etc. If, in a brownfield situation, the dumps

and residences/infrastructure are already in place, a thorough geotechnical risk evaluation should be conducted. If the evaluation results in unacceptable risks, action should be taken to reduce the risk by either modifying the design/slopes of the waste rock dump and/or moving the residences/infrastructure.

Tailings Management Facilities (TMF)

TMF also can pose a risk to individual and/or community safety and infrastructure; especially where high tailing dams are involved. Depending upon the specific location, failure of a tailings dam could potentially pose safety and damage risks kilometers downstream. For this reason, formal evaluations are generally undertaken to assess the potential risk associated with dam failure. These types of evaluations involve consideration of not only dam stability under various climatic and seismic conditions and the time for a dam breach to occur, but also consideration of down gradient populations and infrastructure.

Blasting/Flyrock

Buffer zones are established to prevent injury and damage due to flyrock. PAH recently visited a greenfield site in Sweden in which a 1 kilometer buffer zone was required around the pit – necessitating acquisition of 30 some dwellings and relocation of the residents. In the absence of specific regulations associated with blasting; experts are available to determine the appropriate size of a protective buffer zone. In such a determination, not only residences/inhabitants need to be considered, but also mine infrastructure, roads, walking paths, etc.

Noise and Ground Vibration

Buffer zones are sometimes established around mines due to noise and ground vibration emanating from the operations (e.g., blasting, trucks, dumping, crushing, process plant, etc.). In other words, the buffer zone attenuates noises from the operations prior to reaching residential/commercial areas. For greenfield projects, facilities can be located in a manner to reduce noise impacts. In lieu of an actual buffer zone, barriers are sometimes constructed to block and dissipate the noise. This would include both constructed barriers, such as walls or berms, and vegetative barriers (e.g., tree line). In

cases of facilities particularly sensitive to ground vibrations, buffers zones may not be sufficient for ground vibration control and other isolation measures may be required.

Air Quality/Dust

Air quality issues can necessitate development of a buffer zone to mitigate possible health risks to the local population from dust, etc. Some sort of risk evaluation considering the nature of the operation, climatic conditions, air quality issues involved, etc. dictates the size/type of buffer zone. Experts are available to perform this type of evaluation.

Visual

Buffer zones are considered for visual impacts associated with a mining operation, to mitigate deterioration of local scenery and views, and annoyance of the public. The design for a greenfield project can be developed to reduce the visibility of various components of the operation (e.g., plant, waste rock dumps, stockpiles, etc.) by situating the facilities in lower lying areas or behind hills. Or, for greenfield and brownfield sites, visual barriers can be constructed and/or vegetative barriers developed. Night time “light pollution” from the lighting required for safe operation of a mine at night has become a visual issue in some regions.

This can be mitigated through design of lighting systems to minimize the amount of light projected laterally or upward.

Access/Security

While not necessarily a specific buffer zone issue, access to mining/processing sites is often strictly controlled in part, to prevent safety and health issues associated with some of the potential hazards noted above (e.g., flyrock, air quality, etc.). Access control is determined on a site-specific basis, considering potential risks, etc., but can range from manned road gates to security fencing around an entire facility.

Environmental / Ecological / Cultural Buffer Zones

Some mining operations establish – or are required to establish – buffer zones around archeological/ecological/environmental features to prevent surface disturbance, contamination, wildlife disturbance, etc. Examples of this type of buffer zone would include restriction of work activities around unique habitats for endangered species, and vegetative zones along streams and lakes to prevent sedimentation and/or other water quality issues. Similarly, buffer zones are sometimes established around archeological sites and/or sites of cultural heritage importance (e.g., sites of spiritual/religious significance).

Environmental News

EPA MOVES TO REDUCE MERCURY EMISSIONS FROM GOLD MINES

According to MineWeb and other sources, the United States Environmental Protection Agency (EPA) has enacted legislation under provisions of the Clean Air Act to reduce airborne mercury emissions from gold mines. The new regulations are oriented towards gold mines using autoclaves and roasters. The EPA estimated that 20 gold ore processing facilities in the country are subject to the final rule. This will include a number of mines in Nevada, along with mines in Arizona, Utah, California, South Dakota, Alaska, Colorado, Montana, and Washington.

Mercury emission limits are established for four types of gold production processes, including: ore-pretreatment processes; carbon processes with mercury retorts; carbon process without mercury retorts; and non-carbon concentrate processes. Reportedly in Nevada, the new standard will reduce annual mine mercury emissions by more than 75% from 2007 levels. The new regulations allow only 84 pounds of mercury in emissions for every million tons of processed ore; existing precious metals operations produce approximately 130 pounds of

mercury emissions for every million tons of ore processed. EPA states that some of the Nevada gold processing facilities have already made significant progress towards the proposed reductions under the Nevada Mercury Air Emissions Control Program. Nevada's rules require the use of specific technology while the EPA is limiting the amount of emissions.

MINNESOTA CHAMBER OF COMMERCE SUES MINNESOTA POLLUTION CONTROL AGENCY OVER WILD RICE – MINING ISSUE

The following is from a December 2010 article in the Minneapolis Star Tribune Newspaper:

“The state’s largest business group filed suit against the Minnesota Pollution Control Agency on Friday, raising the heat in an increasingly contentious fight over mining in northern Minnesota and what’s good for wild rice.

The Minnesota Chamber of Commerce, which represents PolyMet Mining Corp. and other minerals companies, accused the agency of holding them to a different standard from other industries on how much sulfate they can discharge into

Minnesota’s wild rice waters. High concentrations of sulfates are toxic to wild rice, and the debate about how much is too much has become a flashpoint in the broader environmental conflict over the proposed expansion of mining on the Iron Range.

The chamber contends that the state’s 1973 sulfates rule is outdated, was intended for commercially grown paddies, not natural stands, and should be loosened — in addition to accusing the PCA of applying it unequally.

Mark Tomasek, supervisor of the PCA’s water quality unit, said Friday he could not comment on the lawsuit. But he said it’s clear from both the language of the rule and the historical record that the standard is intended to apply natural wild rice.

Tomasek also said the agency will enforce the rule whenever it finds through monitoring and data collection that an industry is out of compliance.

The state is reviewing the sulfate standard and other water quality standards as part of a scheduled review conducted every three years or so.

But the sulfate standard has not been included in the regular

review in decades. Nor was it enforced on industry and other potential polluters until earlier this year, when it popped up as an issue in the proposed PolyMet copper-nickel mine near Babbitt and Hoyt Lakes.

In February the federal Environmental Protection Agency sharply criticized the government review of the \$600 million copper-nickel mine — citing as one reason the state's disregard for its own sulfate standard.

Now the state and federal governments are conducting a second environmental review of the mining project. This time the EPA insisted that the state clarify how and if the sulfate rule will be applied — and assess how the project will affect wild rice waters.

Since then the state has told mining companies — but not municipal wastewater treatment facilities — that they will be expected to comply with the rule. The cost could run into the hundreds of millions of dollars, said Mike Peterson, an environmental consultant for the chamber.

That set the stage for the chamber's unusual legal action."

COLORADO APPROVES PLAN FOR URANIUM MILL IN MONTROSE COUNTY, COLORADO

The following is summarized from a January 6, 2011 article in the Denver Post Newspaper:

On January 5, 2011 Colorado environmental regulators approved a radioactive-materials license that clears the way for construction of the nation's first conventional uranium mill since the Cold War.

According to the Colorado Department of Public Health and Environment's radiation unit, Energy Fuels Resources Corp.'s proposed Piñon Ridge mill in western Montrose County is being designed and operated more like a chemical plant than like a mill historically has been operated. A 432-page state analysis concluded that Energy Fuels' application satisfied state requirements to assess impacts on public health, rivers and groundwater. Health department reviewers decided toxic material escaping from the mill would be minimal.

Mining industry leaders called the permit a step toward energy independence. Although the U.S. is the largest consumer of nuclear energy, about 95 percent

of uranium is imported. Today, about 20 percent of the electricity Americans use comes from nuclear power plants fueled by the uranium "yellowcake" that mills produce.

The Colorado Mining Association reports that there is only one operating uranium mill in the United States, and the issuance of this license should help provide a path to bring production online from other uranium operations in Colorado and along the Colorado-Utah border. There are 34 permitted uranium mines in Colorado, though none is producing ore.

Energy Fuels would crush 500 tons a day of uranium and vanadium — if the company can line up \$140 million to fund mill construction. It has hired a Hong Kong-based agent to hunt for capital in China, South Korea and other Asian nations where demand for uranium to fuel new power plants is growing.

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