

# 5th Annual Elko Roundtable discussion: Strides toward sustainability in mining

by Brian Ulrich and Rick Frechette



**Pebble Project, Alaska. Photo by Louise Shannon.**

The majority of individuals involved in the mining industry can appreciate and understand that mining is an activity that is necessary to satisfy the very basic needs of society, and to assist in accommodating our ever-changing world. As the expression goes, “if it can’t be grown, it has to be mined.” And at this point in time, society has granted the mining industry the right to go about the business of mining, with the general anticipation that the work will be carried out without causing undue harm to the environment or populations in and around the mining operation. The term “sustainable development” is gaining momentum as a popular concept, and indeed it has become something of a catch-all phrase, but it is important that the idea behind the term is not cast aside as a nonsense buzz word, as it simply is an indication that development (e.g. mining) can be satisfactorily carried out with an eye toward stewardship of the environment and society.

On Feb. 19, 2010, a roundtable discussion (Roundtable 2010) on “Strides Toward Sustainability in Mining” was hosted by Knight Piésold and Co.

(Knight Piésold) at the Red Lion Inn and Casino in Elko, NV. Knight Piésold had local representatives (Bryan Ulrich and Steve Boyce), as well as representatives from other office locations (Cynthia Parnow and Rick Damiani from Denver, CO, and Rick Frechette from Tucson, AZ) to help facilitate the discussion. The meeting played host to 30 attendees from five states. Attendees included personnel from nine mining properties and various corporate offices. The majority of participants were people who are directly involved with environmental work on a day-to-day basis. Others were project managers whose jobs involve some level of environmental focus.

The purpose of the roundtable is to exchange ideas and information pertaining to sustainability efforts and issues associated with almost any aspect of a mining operation. This type of forum tends to provide a much less inhibited format for discussion, when compared with traditional conferences and symposia. In the roundtable format, lively discussions are encouraged.

This was the fifth in the series of Elko Roundtable events. Previous roundtables pertained to heap leach pad design, construction and operation; design, construction and operation of tailings

**B. Ulrich, and R. Frechette, members SME, are senior vice president, Nevada operations and Arizona operations manager, Knight Piésold and Co. e-mail bulrich@knightpiesold.com.**

storage facilities; site-wide water considerations and mine closure and cover design.

The initial subtopics for Roundtable 2010 included:

## Sustainability

- Defining Sustainability.
- Baby steps vs. giant steps.
- Using hammers – the catalytic converter approach.

## Key drivers for a sustainable mining industry

- Risk
  - Political
  - Permitting
- Environmental
  - Prevention
  - Legacies
- Regulations
  - Stability
  - Clarity
  - Reasonableness
- Public image
  - Media
  - Passive/active
- Community/social
  - Relations
  - Sustainable operations
  - Power and renewable energy
- Employment
  - Education
  - Health/safety
  - Recruiting
  - Work force
- Financial
  - Operating costs
  - Commodity prices
  - Materials
  - Fuel
- Others

## Evidence that the importance of sustainable development is being recognized

- University engineering departments.
- University strategic alliances and secondary degree programs.
- Spin-off companies.
- Consulting arms.

## Examples of recent strides at the mines

- Project permitting strategies.
- Operating project alliances.
- Reclamation and closure strategies and opportunities.
- Forming of partnerships.

The roundtable created a good environment to discuss the current practice and challenges of

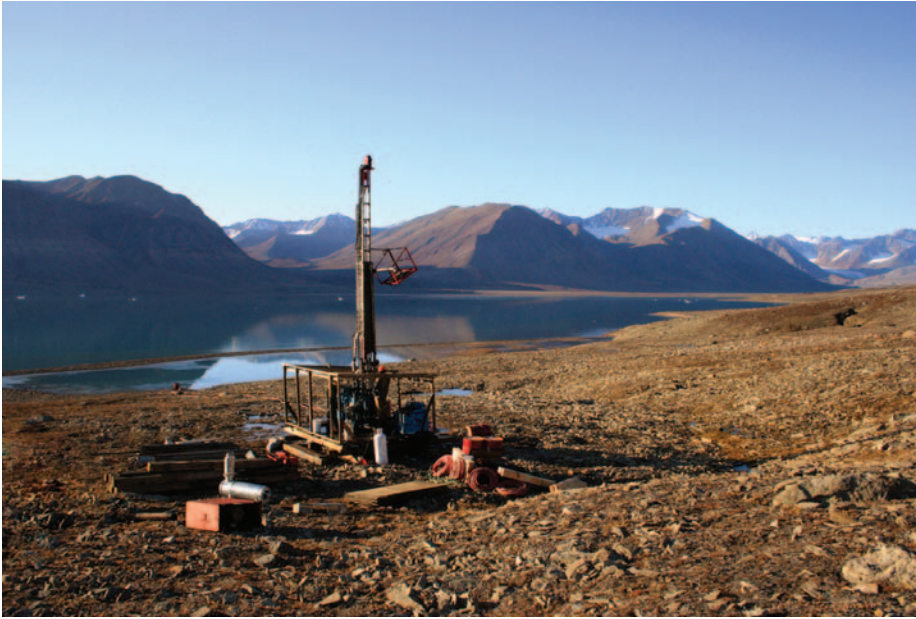


**Settlement near the Ingula Pumped Storage Scheme, KwaZulu-Natal, South Africa. Photo by Dawid Mouton.**

sustainable development. Since there is considerable overlap between the roundtable's subtopics, the conversations frequently wandered from topic to topic and back again. The following is partly a tangential discussion and partly the proceedings of the roundtable.

First, it should be recognized that the notion of environmental protection as a collective concept is relatively young, as may be inferred by the formation of the U.S. Environmental Protection Agency (EPA), which occurred in 1970. Indeed, the term "smog" was not popularized until the 20th century, although there had been a campaign against air pollution in London for 700 years prior. The roles and responsibilities of engineers and scientists have evolved very rapidly during the past few decades. In Samuel Florman's otherwise insightful 1976 book, "The Existential Pleasures of Engineering," caution is advised against "slogans" such as an "abstraction called 'social responsibility,'" although Florman also acknowledges that the "towers of arrogance [that had led up to the new concept of environmental protection] were demolished by the environmental crisis" that had developed in the absence of regulations. Florman's dismissal of the term "social responsibility" seems almost bewildering by today's standards, yet the existence of the phrase apparently was foreign only a few decades ago. Just as mining and other industries now recognize that social responsibility is a necessity, so to has it recognized that sustainable development efforts are needed.

Since the concept of sustainable development is relatively new, its meaning has different connotations to stakeholders of various industries, including the mining industry. It can simply mean being able to operate a mine for a long period of time, or it can mean rehabilitating the post-mined land into an ecosystem that is viable, useful and fitting for its setting. Or it can imply providing, in some way, for the population around a mine property, possibly even after mining ceases. It does not seem to suggest that the post-mine land use must



**Geotechnical drilling at Mestersvig Fjord, Eastern Greenland. Photo by Ryan Veenstra.**

be equal to the pre-mining land use.

The United Kingdom government defines sustainable development as a process that leads to a better quality of life for everyone, now and in the future. This seems overly broad, overly ambitious, and emplaces almost unreasonably high expectations, after all, how can any one effort improve everybody's quality of life? There are a few examples that seem applicable, such as having cleaner air. But since every significant technological development involves a process, sometimes complex, it becomes difficult to 'weed through' the direct and indirect costs and benefits of any endeavor.

**Heap leach facility at Fort Knox, Alaska. Photo by Shaun Persaud.**

There are specific activities that are undoubtedly sustainable, such as a well regulated and performed hunting, fishing and trapping industry, which helps nature to balance animal populations,



especially in the absence of other natural predators. There are also scientific applications and developments that are significant examples of benefiting populations, such as the eradication of the pull tab from aluminum beverage containers. It is now practically unheard of to observe a pull tab carelessly discarded on the ground, while it was all too common of a sight before the invention of the current pop top.

Written procedures, step-by-step recipes, if you will, aimed at achieving sustainable development, are notably unavailable for the practitioner, even though some of the sustainable development initiatives (such as MMSD, or Mining, Metals and

Sustainable Development, which ran from 1998 until 2002) produced enormous amounts of documents and discussion. The preponderance of literature on the topic, rather, is aimed at providing thought-provoking illustrations, examples, and sets of guiding principles to assist in formulating plans and approaches for achieving sustainable development. An amalgamated definition of sustainable development, as it pertains to the mining industry, indicates that "sustainable development is an asymptotically approached ideal where positive strides are necessarily engaged, appropriate solutions are employed at appropriate scales, while considering the concept of diminishing returns, to formulate a project that is financially viable and socially responsible, from cradle to grave, while avoiding post closure legacy issues."

But still, the concept of sustainable development is somewhat nebulous since, as the description above suggests, it can be approached, but never achieved, similar to the theory of the "frog on a log," where the frog makes an endless series of jumps, with each jump putting the frog half way to the end. It can be generally accepted that at some point the frog is close enough to the end of the log to declare it to have essentially reached its goal, for all intents and purpose. Perhaps the attainment of sustainable development should be viewed similarly, that is, that significant advances are sustainable development accomplishments.

At the core of the sustainable development concept is the desire to balance social, economic, and environmental impacts. Perhaps a term such as "agreeable development," or "conscientious development" would be easier to get our

arms around. Or, perhaps it is better simply to revert back to the doctrines of “best practices.” Nevertheless, with or without concrete definitions for the term sustainable development, there are many positive attributes of the notion that should be embraced.

One of the most provocative activities for the roundtable attendees was to describe what the term sustainable development means to them individually, either in part, or in full. In addition to the discussion above, participants indicated that aspects of sustainable development, as it pertains to the mining industry, should include:

- Being very site specific, and tailored to each individual project independently of, but not without consideration of, successes and failures of other operation;
- Employing best-practices that are economically viable, both for short-term and long-term outcomes;
- Close consideration of post-mining land use;
- Considering ways of prolonging the mining operation, such as re-processing previously processed materials;
- Considering post-mining employment possibilities;
- Recognizing that the mining operation is also a member of the community;
- Considering how populations and communities may evolve in mining areas, and consider the impact of those communities during the post-mining era;
- Considering partnering with the neighboring communities;
- Considering remaining adaptable as circumstances evolve; and
- Considering leaving behind a positive legacy.

On top of all these considerations, it was recognized that sustainable development should not indicate an open checkbook. There are also aspects such as recycling and the reduction of energy requirements that work well with the concept of sustainable development in mining. Applications of renewable energy were also discussed. Since many mining operations are situated in areas prone to wind, wind energy is one interesting application that may help satisfy some energy needs of mining operations, and also provide for the post-mining communities. Like other concepts, such as paste tailings, renewable energy should not be seen as a panacea, but it should be considered sensibly when and where it may be appropriate.

It may be surmised from the plethora of far-



reaching definitions provided by the group, that a single definition is elusive, but most attendees would agree that even though it is difficult to define the term, one would likely know a successful illustration of sustainable development if one was provided with a good example, much in the way that good art is hard to define, but easy to recognize.

Mining has made some significant strides toward sustainable development along several avenues, including prolonging the lives of current mining operations, and working with neighboring communities to help stabilize the necessary growth of those population centers. Very few mining operations would desire to leave behind ghost towns upon their closure. Many mines have been in operation for decades, and have been at the helm of community growth efforts. Mines with initial design lives of 10 years have gone on to continue to operate for several decades, becoming intimate partners with the community. While it is quite common to revert post-mining lands to grazing and wildlife habitat areas, there are other opportunities being met by mining companies too, such as donating portions of operations, especially operations with historical significance, as “living” museums and donating unused buildings to communities for their own use.

This year’s subject offered far more challenges with respect to generating conversation than previous topics, but by the end of the afternoon, an impressive amount of information had been shared and it was generally agreed that the time was spent productively. By all accounts, this year’s roundtable was seen as being highly successful. Next year, Knight Piésold will once again be hosting a roundtable discussion in Elko, where the topic will return to more traditional engineering and scientific subject matter. ■

**Local women pounding palm fruits to make palm oil, Sinthiourou Tiouladi, Guinea. Photo by Bryon Boyle.**