

**HOOF, MOUTH, AND MANURE
LIVESTOCK AND MINE LAND REHABILITATION
“Sustainable Mine Land Rehabilitation: the Overview”¹**

by

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Abstract. Communities and local, state and federal government agencies are becoming increasingly serious about long-term sustainability of natural, human and economic resources, including those associated with mine sites. Because of this, and because environmental and social responsibility is important to mining firms, many are beginning to look for approaches to rehabilitation of disturbed land (e.g., large-scale tailings impoundments, waste rock disposal sites, facility areas) and surrounding areas that result in sites that are “naturally self-sustaining.” To produce such results, firms will increasingly look to both new tools and technologies, and to the management process they use and pass on to entities who may own or manage the land in its post-mining state. Holistic Management offers a methodology for planning and achieving long-term sustainability. This paper and presentation offer insights into the process and its value to the mining industry.

Additional Key Words: management, process, whole systems, monitoring, biological diversity, sustainability.

Introduction

Throughout the world communities, businesses and government are seeking greater “sustainability” of biological, economic and human resources. This is a trend that has gone from being “fashionable” to being essential. And, it is a trend that has certainly become important among mining companies, communities surrounding their sites, and the various agencies that regulate mining and rehabilitation activities.

Although the word “sustainable” is used often, and by many, there is no agreed upon definition of the term. And, what is “sustainable” for one community or business may not be sustainable for another. There is, however, some agreement around the world on some basic principles that underlie a community, company, or nation that is “more sustainable.” These include:

- economic growth;
- ecological balance; and
- social progress.

These principles speak to a more “holistic” way of looking at natural resources and human economic activity and social needs – as elements of a whole that is not separable into its parts. Key to this view is the understanding that human activity – whatever it is – has to meet the needs of the present without sacrificing the ability of future generations to also meet their own needs.

In the mining industry, these principles are especially important in the rehabilitation and closure phase of an operation, though they are becoming more common in the siting and permitting phases as well. This is sometimes called “the triple bottom line” – which includes consideration of social, environmental and financial performance issues.

This emerging “sustainable” approach is a significant change from the principles used for most mine rehabilitation in the US and overseas. The standard methodology for mine rehabilitation generally relies on technologies that can be applied in one-shot or short-term applications that produce the quickest possible results:

- stabilization of slopes,
- suppression of dust, and
- establishment of “native” vegetation with minimal cost of direct inputs or management.

The focus is on meeting regulatory standards, and limited consideration is given to the

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“handover” or transition of the land to the next owner and management for the land’s long-term productivity.

For Mining companies to achieve greater financial, social and biological sustainability in their closure and rehabilitation they need:

- a design and process for post-mining land-use that includes stakeholder input;
- focused and effective decision-making;
- a process for assessing each tool/technology proposed;
- cost efficient, and effective, use of tools and technologies;
- a way to monitor the tools used and quickly modify the plans if need be;
- a means for planing the long-term hand-over of the land.

During the last ten years, a few pioneers in range land restoration have adapted reclamation technologies developed originally by Allan Savory, founder of the Center for Holistic Management, for use in range, desert and grassland environments to mine land rehabilitation. Initially, interest in these methodologies has revolved principally around the technologies of animal impact and grazing (alone or with additional inputs such as seed, mulch, green waste, etc.). However, while these tools are of great value in disturbed land rehabilitation, the planning, decision-making and monitoring/re-planning potential in Holistic Management to assist mine companies to achieve sustainable rehabilitation is significant and often overlooked.

Holistic Management process is simply a thought-model or organizing framework to help mining companies work through the process of engaging stakeholders to create a long-term plan for hand-over and a process for making the rehabilitation activities increasingly sustainable and in line with the company’s efforts to produce greater sustainability (at home and abroad).

What is the basic framework of Holistic Management planning and decision- making? How does Holistic Management work? And how might it be adapted to mine rehabilitation work? The basic process of Holistic Management is as follows.

Identify Decision-Makers and Those Who Will be Affected

Holistic Management offers an effective way to identify people tied to the site and their specific role/function. This includes those who are, and will be, impacted by the site and/or the rehabilitation. The stakeholder group is, then, brought in at key junctures to assist with the long-term planning and monitoring of the site.

Establish Post-Mining Landscape and Uses

After identifying decision-makers and stakeholders, the Holistic Management planning facilitates the establishment, with stakeholder input, of a description of the post-mining landscape and possible uses. This sets the stage for the planning team to also begin designing a long-term transition and management plan .

Assess the Tools and Treatments

Any methodology working to achieve longer term sustainability also needs a focused and effective way to assess the treatments and technologies that are possible for use at the site. The Holistic Management process provides a means for companies, agencies and stakeholders to make focused and effective decisions toward the landscape description they have created. This process follows the ‘triple bottom line’ rationalization by requiring the management to test each decision for its social, financial and biological soundness toward the landscape description that the company and stakeholders have developed together.

Monitor and Re-Plan

Producing long-term sustainability from the initial rehabilitation treatments requires also some process of monitoring and re-planning. Sustainability (of the natural world and humans in it) is not a static state but a dynamic ongoing progression. It requires monitoring and, when needed, “tweaking.” This is true of mine rehabilitation that is working toward greater natural sustainability. Holistic Management offers an “early warning” monitoring process specifically designed

for periodically determining if the tools and technologies being used are moving the site toward the landscape description agreed to by the stakeholders and the company.

As you can see from the description above, Holistic Management is a decision-making framework that is founded on the concept of sustainability. This approach recognizes the essential connection between human well-being and the health of the environment on which we depend, and makes it an integral part of resource decision-making.

Using a decision-making and management approach that emphasizes long-term sustainability has value for any mining company. This value includes:

- building “naturally sustaining” biological resources;
- creating community and regulatory support;
- enhancing the bottom line through cost-efficient rehabilitation and reduction of long-term environmental and social liabilities, and
- improving the company’s reputation.

This type of approach to long-term land rehabilitation and management takes some effort and does not happen overnight. It is, however, more sustainable in the long run, and will result in improved profitability for mining companies that are seeking to create value for society as a whole. Holistic Management has a great deal to offer mining companies looking for an effective and efficient planning, decision-making and monitoring approach to long-term sustainable land rehabilitation.

Literature Cited

Savory, Allan 1999. *Holistic Management: A New Framework for Decision Making*, Island Press, Washington, DC.

Stigson, Bjorn, President, World Business Council for Sustainable Development, “Sustainable Business: Performing Against the Triple Bottom Line, ICME Newsletter, Vol. 6, No. 3.