
Are You Comfortable? Changes in Community Attitudes and Influences on Strategic Mine Planning

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Introduction

This paper discusses some issues arising in the wider community that influence the context in which mining projects are planned and developed. Challenges these issues present for people involved in project evaluation and strategic planning are then discussed, with reference to a change in emphasis, from seeking and presenting technical solutions, to strategic planning that encompasses both the technical and societal aspects of mining projects.

The mining industry is subject to increasing pressures from the wider community about the way in which it is able to conduct its business. These primarily relate to attempts to control the impacts a mining project has on the surrounding environment and community. These impacts may or may not be real and there are often fundamental differences in opinion about their effects. The mining industry suffers from a poor public image and perhaps more importantly, from inaccurate perceptions about its ability to pay the cost of meeting more wide-ranging and higher standards of environmental management that are gradually being required of it. The mining industry is sometimes portrayed as somehow existing separately from the community, not actually contributing to the community's continued enjoyment of high standards of living and as being opportunistic, rapacious and uncaring about its impacts on the

environment and society. There is little the industry can effectively do to correct these perceptions without further alienating the extensive array of people in the community who take the view that the industry uses its supposed strength and influence to suppress the views of those who object to its activities. It is likely that the wider community will continue to seek to make the mining industry subject to increasingly stringent regulatory standards, particularly in environmental and occupational health and safety management.

The industry is also under pressure because of the lower than average returns it provides to investors. This under-performance will combine with the added regulatory pressures to make fewer funds available to new mining projects. Potential projects will be viewed as being unable to meet the evolving environmental management criteria whilst generating acceptable returns to investors. Not only will there be increased pressure for financial success but the failure of projects will make it even more difficult for other future projects to commence if the community sees undesirable outcomes arising from past failures.

The Challenge for Strategic Planning

This scenario means that effective strategic mine planning will become continually more important. There will be increased pressure on those involved in the planning process to

produce robust and defensible mining projects that can demonstrate an acceptable return on investment from not only the management of mining and processing of ore, but also from an ongoing program of whole of mine management where a project is planned to be bought to an orderly conclusion in terms of the long term stability and sustainability of the resultant disturbed land forms, associated ecosystems and communities. Whole of life mine plans are now beginning to be required by regulators before approvals are granted. It is no longer acceptable for companies to say that these issues will be addressed during the life of the operation. Substantial amounts of money can be required to be spent after mine production and associated cash flows have ceased if operational planning does not consider the ultimate fate of the mine site. Governments will not take on the responsibilities of post-mining monitoring, remediation and management.

Regulators and financiers will require higher standards of planning and analysis before they will approve or finance mining projects. To meet this challenge, the scope of strategic mine planning will need to be broadened beyond the technical analysis of mining and processing options to include whole of life environmental management planning and consideration of the social context in which the mining project will occur.

Before looking further at the external context in which strategic mine planning exists, it is worth reviewing what it is that mining companies do. Rudenko (1998) said "*..the primary aim of resource companies is to find, develop and extract mineral resources...where...a mineral resource is an economic occurrence of an element in nature..*" This seems a self-evident definition but is it really this simple? Mining companies spend investors money to carry out these activities. Ideally, successful extraction of mineral resources will take place over a sufficient period of time to

allow a return on the initial investment in that project, as well as generating sufficient cash for the concurrent expenditure of more money to find, develop and extract minerals from a new project, replacing the initial project at the end of its finite life. In effect, mining companies attempt to perpetuate their own existence by working through a cycle of exploration, development and production. If companies are successful, they hopefully develop and sustain a reputation that will cause investors and financiers to continue to support their activities.

The requirement for exploration to find mineral occurrences and to define economic resources upon which mining projects can be developed is peculiar to the mining industry, though perhaps there are parallels in the continual identification and development of new retail marketing opportunities, where a continuous process of product reinvention occurs. People continue to invest in the minerals industry and specifically, they continue to invest in exploration for mineral deposits, where such exploration is generally an unsuccessful activity. Considerable sums of money are sunk in exploration activities, money that is a substantial part of the cost of sustaining the supply of economic mineral deposits to the industries of the world. This investment in relatively high-risk activities is supported by a large number of participants with small individual levels of exposure compared to their total investment portfolios. It may be possible that because the exposure to failure of mining investors is spread amongst more participants than in other areas of investment that the price of poor management is more easily accepted. Whilst there may be a difference in the acceptable levels of risk for companies funding activities by equity and by debt finance, Joukoff (1997) made a strong case for the application of sound principles of strategic mine planning in the early stages of exploration, well before a mine is even defined. Exploration is more likely to be

funded by equity and carries a higher risk of failure, but careful application of strategic planning techniques can extend the value of the funds available and increase the likelihood of exploration success.

Economic mineral resources are normally considered to be finite in their extent within the limits of prevailing forecasts about production rates, costs and commodity prices. Once mined, deposits are unlikely to be revisited in the future, although technology change in exploration techniques, extraction processes or the usage of metals may mean that previously worked areas can be reworked. Deposits that were previously uneconomic may become viable over time as a result of the effect of changing commodity prices or technology change in mining or processing.

Unexploited mineral deposits do not disappear over time through natural causes, the metal will always be there in the future. What may change are the preferences of society in its choice of acceptable land use which may result in the sterilisation of mineral deposits in national parks or other preferred land uses.

However, contrast the rational decision to leave uneconomic minerals in the ground with the preference of mankind to discount future benefits, particularly when there is doubt about whether the opportunity will even exist in the future to gain those benefits. People would rather accrue benefits arising from some activity now or in the very near future rather than at some uncertain future date. Where a deposit is clearly uneconomic, a decision not to proceed is easily made. But what about situations where a project could be made to work with the application of the right costs or prices or process recoveries? Is it possible that the low conversion rate of mineral deposits into mines tends to induce a factor of optimism into feasibility studies and evaluations of whether a deposit can be commercially exploited? According to the Concise Oxford Dictionary, feasible means

"..practicable, possible, (loosely) manageable, convenient, serviceable, plausible..". Rudenno (1998) says that a "..feasibility study - is a technical and financial study of a project at sufficient level of accuracy and detail to allow a decision as to whether the project should succeed".

This is a reasonable definition if feasibility is limited to studying whether the project is practicable or possible, but when feasibility studies which only focus on the plausible become the basis for getting projects up, then that is another matter entirely. Is there a tendency in some cases to do everything possible to make a marginal deposit into a mine, during which process various risks are ignored or glossed over? This might tend to produce mines which to succeed, require the most remarkable confluence of positive factors to combine to produce an acceptable return on the resources invested in them. Such mines are balanced on a knife-edge, needing only the slightest push in the wrong direction to head down a path of certain failure. Perhaps it might be better to leave these deposits in the ground and direct the funds, effort and energy into the development of some other project that has sufficient margins to weather any reasonably foreseeable problems that may be encountered.

There are also other pressures that can be brought to bear on a company to develop a deposit. These may take the form of government incentives to encourage investment in a region in the hope that jobs are created and that flow-on effects bring other benefits to the wider community. However, consider the effect on a community, of hopes being raised and then dashed through the failed development of a mineral deposit? This can result in antagonism toward future proposals that may actually stand a greater technical chance of success but which are tainted by the failure of previous and unrelated ventures which may have left local communities and businesses carrying debts and other problems. When this happens it is

extremely difficult for the new proponents to convince the community that they are going to be able to deliver on their promises and the community naturally discounts the potential for such future benefits very severely. It is even possible the community is actually completely indifferent to the supposed benefits and at the same time is applying what might be termed a compounding factor to the negative impacts that a project might bring, which is then manifested as outright opposition to the project.

If these are some of the challenges facing strategic mine planning in the future, what will be the necessary features of the strategic planning process? Analysis and decision-making is obviously already a central activity in the development and operation of mining projects. A direct consequence of the greater influence from external factors will be the need for more wide-ranging analysis as the basis for the decision-making process. Decisions will need to be robust and defensible against increasing levels of external scrutiny. Disclosure of increasing amounts of information about proposed developments will be required. Planning management systems will need to be used that clearly and explicitly allow for audit and review of internal decision-making processes.

Those involved in strategic mine planning will need to adopt methods of more effectively utilising the resources available to them. There will be continual pressure to do more with less. The management of effective strategic mine planning teams will need to ensure that the participants have time to reflect upon where their work is leading and be allowed to be wide-ranging and broad-minded in their planning activities. It is likely that the application of mechanistic checklists of key activities under the pseudonym of management systems will not make sufficient allowance for the exercise of imagination and professional expertise. At the same time,

participants need to be aware of the appropriate amount of effort to direct at a problem. The planner must be able to recognise when effort is being expended for no reasonable return and to be able to call a halt, so that the limited human inputs to project evaluation can be redirected elsewhere, where there is a greater likelihood of a useful return on effort.

In recent years optimization methods have been widely adopted in the mining industry in Australia and elsewhere, as a tool for assisting in the mine planning process. However optimization methods alone don't give clear direction because they give as many answers to scenarios as planners care to generate. The process of optimization in strategic mine planning should be recognised as one of the many tools that will assist in the critical evaluation of alternative options for the use of resources that a company has available to it.

People can also get trapped in the process of mastering the tools they have available to them without actually producing much in the way of useful outcomes. The ability to competently use a particular suite of software or technique can be quite beguiling to people who pride themselves on their technical prowess. Employment advertisements for mining and geology professionals often seek specific skills or experience in using particular software packages but they must be subordinate to other skills and attributes which are much more important in professional analysis and decision-making. If an individual has competence in one mining package they can soon learn to operate another package, but if they don't have an enquiring and analytical outlook when problem solving, then that is a rather more difficult skill to acquire.

The advances in technology that have resulted in a continual stream of more powerful computers and upgraded software tools, has also produced an ability to acquire data much more easily than ever before. However the transformation of data into

information and then into knowledge does not seem to have advanced at the same rate. Data collection and analysis of information can become a significant consumer of scarce resources without necessarily assisting in the ultimate decision-making processes. The collection of information becomes a significant function because it is an interesting and challenging activity to engage in.

In the mining industry, there is much emphasis upon measurement, recording of data and statistical modelling in an attempt to understand or to reduce the uncertainty present in the operational environment. Information gathering is expected to ensure that soundly based decisions will be taken. Sometimes it only serves to increase ambiguity because measurement and data collection is poorly planned and executed. The opposing approach is to measure or analyse everything so that the information will always be available when it is needed. The information stream becomes a security blanket or form of insurance against future problems but the task of collecting all the information becomes so overwhelming that it is likely to fail and produce incomplete data of limited value.

A related problem is focusing too much on historical information. Whilst experience gained in the past is generally seen as an important influence on decisions about future activities it is also possible to over analyse past events. The planning process becomes paralysed by analysis of historical information in the hope that some vital clue will emerge that will stop the repeating of past errors and mistakes. A similar paralysis can occur by over evaluating possible future options where the differences between them are actually much less significant than the uncertainties that may exist in the fundamental assumptions that underlay all the cases.

Strategic mine planning is not going to get easier, it is going to become more involved and more difficult to effectively manage.

The increasing complexity of issues to be addressed will mean that the inefficient use of scarce human and technical resources in the planning process will yield results that are less likely to be acceptable in the face of increasing external scrutiny. The challenge will be to work within the constraints of a management system that can continually facilitate the assessment of work done to date and effectively direct the utilisation of the available resources in response to that progress. The system will need to adopt risk analysis techniques when determining priorities as the planning progresses. Effort will have to be directed at those factors that have the greatest leverage on the project outcome. This may be difficult to achieve when there are many different professional disciplines involved who all believe that their contribution is critical to the project when in fact the relative importance can vary significantly from project to project.

The time spent communicating the outcomes of project planning work to other project team members, to other personnel within the company and to external organisations will be crucial. As planning becomes more complex as the number of issues to be considered increases, the task of communicating both the complexity and the essence of the planning outcomes becomes even more difficult. The products of planning need to be presented in a way that highlights the quality of the arguments and analysis rather than relying on sheer quantity of paper and reports aimed to deter methodical and detailed critical scrutiny. Reports and documentation need to be succinct and pertinent so that the essence of the arguments and conclusions reached is readily apparent. This is particularly important when dealing with community groups where attempts at obfuscation can affect trust and relationships that may have been developed over quite some time. It may be necessary to present information in different forms depending on whom it is directed at. If this is not done carefully, it can lead to over simplification that

undermines the inherent complexity of the arguments being presented. What is communicated will also vary between the different groups of people who are involved. It is important that this does not lead to the propagation of inconsistencies between what is said at different times or to different groups.

Conclusion

The mining industry is judged not by its successes but by its failures. In a society that is becoming more critical and demanding through the standards that it applies to the mining industry, failure of projects to perform as expected will make it more difficult for the industry to operate. People involved in strategic mine planning must always be mindful of their responsibility to increase the likelihood of a successful outcome. If that means arguing against a marginal project from proceeding where the risk of failure is high, then that should be recognised as being as acceptable as an elegant solution for improving the profitability of a robust project.

Mining is a misunderstood activity in the wider community. Its technical sophistication, capital intensive structure and wide geographical distribution means that it directly impacts on relatively few members of the community yet it struggles with adverse perceptions that it is an exploitative and uncaring industry.

Effective strategic mine planning will enable the mining industry to continue to contribute to the well being of the community through being aware of the context in which mining projects exist and responding accordingly.

References

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