

Thinking beyond closure: Toward a Mine Closure Database

K. Svobodova¹, A. Littleboy², J. Owen³, M. Edraki⁴, R. Higgins⁵

1.
Research Fellow, Sustainable Mineral Institute, St Lucia QLD 4072. Email:
k.svobodova@uq.edu.au
2.
Program Leader - Mine Life Cycles, Sustainable Mineral Institute, St Lucia QLD 4072. Email:
a.littleboy@uq.edu.au
3.
Professorial Research Fellow, Sustainable Mineral Institute, St Lucia QLD 4072. Email:
j.owen@uq.edu.au
4.
Principal Research Fellow, Sustainable Mineral Institute, St Lucia QLD 4072. Email:
m.edraki@cmlr.uq.edu.au
5.
Adjunct Professor, Sustainable Mineral Institute, St Lucia QLD 4072. Email: r.higgins@uq.edu.au

INTRODUCTION

The business of mine closure is global. Delivering against mine closure plans has proven difficult for the industry. As shown in the example provided in Figure 1, there is a small percentage of mines that are able to disclose the year in which they expect mining activities to formally close. Planning for closure requires careful consideration of a number of issues. As a planning principle, it is accepted that mine closure planning should be integrated into the systems and decision-making processes throughout the life of mine. The assumption is, that done well, this will provide an opportunity to demonstrate industry's commitment to sustainable development by incorporating physical and social aspects into the mine planning process.

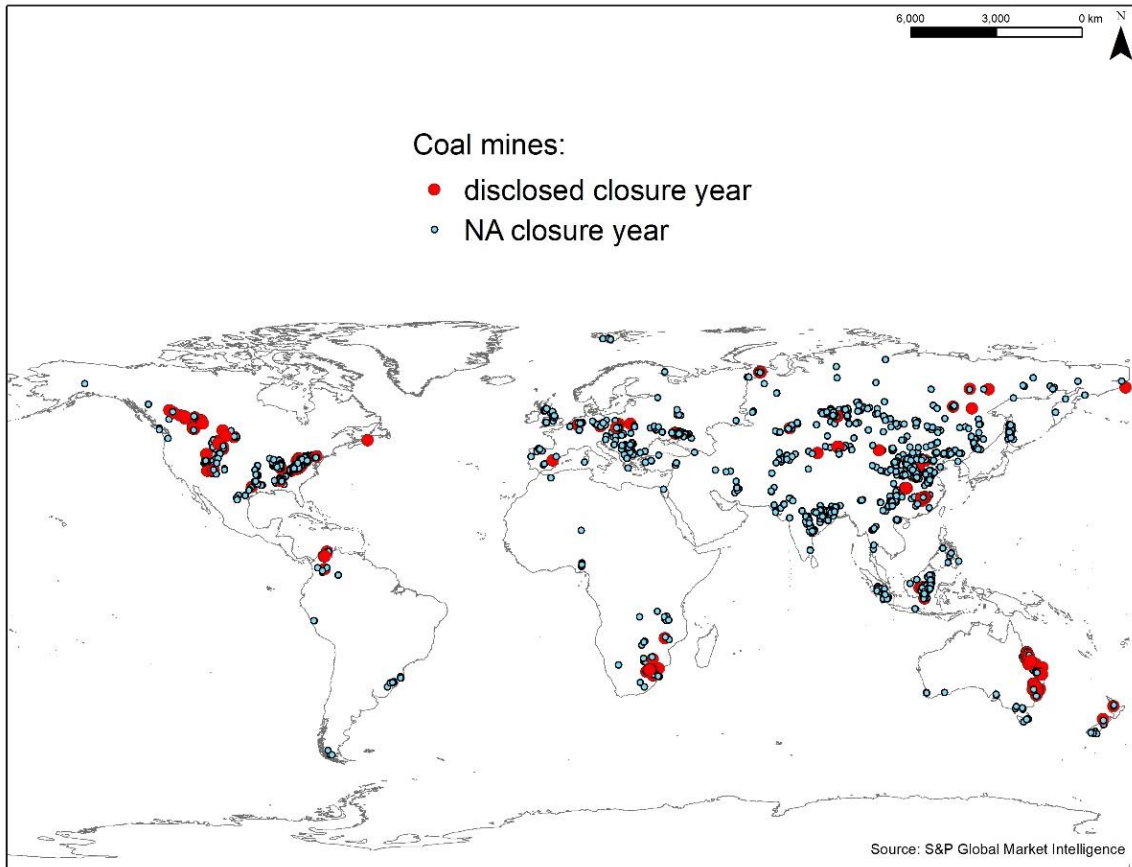


FIG 1 – Coal industries have been challenging by a growing global movement towards emission reduction. Implications of this change will be substantial, amounting to major disruptions to regional economies, demographics and social organisation worldwide. Based on the data from the S&P Global Market Intelligence database (S&P 2019), we can demonstrate the critical number of operating mines that expect mining activities to formally close in a particular year - about 13% of all operating coal mines.

Mines close typically after many decades of operation. As mine footprints develop and mature, closure becomes a more salient issue – for the mine operator, the investor, the regulator, and the local community. There is no single policy jurisdiction in the world that provides an ideal model for mine closure (APEC 2018). Research indicates that closure issues are considered on a site by site basis (Vivoda et al., forthcoming). However, even though mine closure planning is unique, there are commonalities between the sites that indicate critical factors influencing closure process.

The previous two decades research on mine closure has highlighted a range of factors that companies, communities and governments face in designing mine closure (Owen and Kemp 2018, Laurence 2001). In this paper, we focus on complexity of these factors and how they can affect the closure process and post-closure legacies.

AIM AND APPROACH

The aim of this paper is demonstrate how a Mine Closure Database can be used to explore questions about the magnitude of the closure challenges facing the industry. The purpose is to assist the industry, research institutions and governments to map ESG risk factors that are likely to add complexity to the mine closure process. The approach that we use in developing the database is twofold. First, the database aims to create a list of key factors of various environment, social and

governance issues to map the commonalities between the mining sites that make closure difficult. Second, the database compiles successful examples of mine closure practise where the commonalities are examined and tested.

The concept of the Mine Closure Database is based on a global dataset of case records extracted from the S&P Global Market Intelligence database (S&P 2019) as an initial data source that is complemented by other global data sources such as World Bank Open Data (World Bank, 2019), World Database of Key Biodiversity Areas (KBA, 2019), HydroATLAS (HydroLAB, 2019) and others. The S&P database is one of the largest, most comprehensive and up-to-date sources that that has been previously used in extractive research, for instance in Valenta et al. (2019). Using global data enable us to focus on global difficulties of mine closure, giving a competitive advantage in the global marketscape.

We believe that the Mine Closure Database can contribute to development of adaptive strategies in closure planning that are responsive and relevant to different national contexts in a global marketplace.

ACKNOWLEDGEMENTS

The project is part of a research program The Mine Life Cycle, one of five strategic research programs at the Sustainable Minerals Institute, the University of Queensland.

REFERENCES

- APEC (2018). Mine Closure: Checklist for Governments. APEC Mining Task Force. Singapore. Available at: <https://www.apec.org/Publications/2018/03/Mine-Closure---Checklist-for-Governments>
- HydroLAB, 2019. Department of Geography at McGill University: HydroATLAS. Available at: <http://wp.geog.mcgill.ca/hydrolab/hydroatlas/>.
- KBA, 2019. BirdLife International on behalf of the KBA Partnership: World Database of Key Biodiversity Areas. Available at: <http://www.keybiodiversityareas.org/home>.
- Laurence, D. (2001). Classification of risk factors associated with mine closure. Mineral Resources Engineering 10.03: 315-331.
- Owen, J. and D. Kemp (2018). Mine closure and social performance: an industry discussion paper. Centre for Social Responsibility in Mining, Sustainable Minerals Institute, The University of Queensland: Brisbane.
- S&P, 2019. S&P, 2018. S&P Global Market Intelligence. Thomson Reuters, New York, United States. Available at: <https://www.spglobal.com/>.
- Valenta, R. K., Kemp, D., Owen, J. R., Corder, G. D., & Lèbre, É. (2019). Re-thinking complex orebodies: Consequences for the future world supply of copper. Journal of Cleaner Production 220: 816-826.
- Vivoda, V., Kemp, D., & Owen, J. R (2019). Regulating the social aspects of mine closure in three Australian states. Journal of Energy & Natural Resources Law. Manuscript submitted for publication.
- World Bank, 2019. World Bank Open Data. Available at: <https://data.worldbank.org/>.