

SEG 2024 Conference: Sustainable Mineral Exploration and Development

Minimising the Environmental and Social Impacts of Exploration: Lessons from the GREENPEG Project

Kate Smith¹, [Frances Wall](#)¹, Robert Pell²

1. Camborne School of Mines, University of Exeter, Penryn, United Kingdom, 2. Minviro, London, United Kingdom

Mineral exploration is essential to provide the metals that we need for a low-carbon future. This exploration must be environmentally and socially responsible.

We have applied life cycle assessment (LCA), a powerful technique to quantify environmental impact, to exploration techniques developed and refined within the GREENPEG project. These assessments have highlighted ways to reduce the impact of exploration, many of which involve practical adjustments that are easy to implement. We have investigated satellite remote sensing, ground-based, drone- and helicopter-borne geophysics and geochemical techniques at province, district and small prospect scale. During fieldwork, travel choices are clearly very important, demonstrating the need to consider local hiring of staff, car-sharing, use of electric vehicles when viable and minimising travel during fieldwork by using accommodation as close to site as possible. LCA also allows us to demonstrate the great value in making data publicly available, for example the GREENPEG spectral library aids spectral identification of outcropping pegmatites with a much reduce environmental impact.

We made qualitative studies of social impacts so we could explore local community and individual perspectives in depth. GREENPEG interviews carried out in Norway and Ireland and surveys in Portugal and the UK highlight the importance of building company-community relationships as early as possible, and of understanding social context and history and the value in trying to look at an exploration project through a community lens. In our case studies, the exploration activities themselves were less of a worry than concern about possible future mining. The growth and spread of this anxiety and fear in a community, even from an early project stage, is the main social impact of exploration that needs recognition and empathy.

Relationship building and community participation in projects may be key to tackling these worries, which otherwise may stall or halt the progress of a project.