iCRAG IRISH CENTRE FOR RESEARCH IN APPLIED GEOSCIENCES

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iCRAG, the SFI Research Centre in Applied Geosciences, Response to "Consultation on Mineral Exploration and Mining" published for circulation July 2021

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About iCRAG

iCRAG is the SFI Research Centre for Applied Geosciences. We are a team of researchers creating solutions for a sustainable society.

We develop innovative science and technologies to better understand the Earth's past, present, and future and how people are connected to it.

We drive research in areas that are critical to society and the economy, including:

- Sustainable discovery of energy resources and raw materials required for decarbonisation.
- Securing and protecting groundwater and marine resources.
- Protecting society from Earth's hazards such as floods and landslides.

iCRAG, the world leading SFI Research Centre in Applied Geosciences hosted by UCD, comprises approximately 150 researchers across eight universities and institutions. iCRAG is supported by Science Foundation Ireland, Geological Survey Ireland and industry partners.

www.icrag-centre.org

iCRAG welcomes this opportunity to contribute to the consultation on mineral exploration and mining in Ireland.

In welcoming the draft policy, iCRAG wishes to highlight that sustainably managed mineral exploration and mining can enhance Ireland's supply chain of critical raw materials, provide employment across the island through the provision of skilled, high-paying jobs, and secure many of the materials needed as part of the green transition and economic resilience.

As Ireland's applied geoscience research centre, iCRAG is actively creating foundational information and analysis relevant to Ireland's mineral exploration and mining activities, as well as conducting research on the social accessibility of primary raw materials. iCRAG has an established network of industry partners in the mineral exploration and mining areas and has strong relationships with several government bodies and agencies.

COMMENTS AND OBSERVATIONS:

2.2 CIRCULAR ECONOMY STRATEGY

iCRAG welcomes the highlighting of the rehabilitation of mine sites, with the Lisheen mine in particular providing an excellent template for how former mine sites can be developed and re-purposed.

Due to improvements in processing and analysis, mine wastes and tailings may be able to provide an important source of raw materials. Current iCRAG research has identified potentially significant quantities of Ge and Zn in historic mine waste that may form a resource for the future. Further research dealing with the elemental composition of mine wastes, as well as all other industrial and agricultural wastes is required to understand what elements are present in such materials as a first step to determining if they can be extracted in a socially and environmentally acceptable, as well as economic manner.

2.10 CRITICAL RAW MATERIALS

Both Ireland and the European Union must have a sustainable and secure supply of critical raw materials to achieve the climate goals of the Green Deal, to enable rapid decarbonisation, and to support a just and equitable energy transition. More than 80% of EU raw materials are imported, and EU production currently provides only 1% of the raw materials needed for wind energy which is a vital renewable energy source set to increase in capacity under the Climate Action Plan.

This dependence on third countries makes both Irish and European industrial and strategic supply chains highly vulnerable to disruption and ties them to sources that may have weaker environmental and social oversight of mining than the EU. It also threatens the EU's ability to manufacture the raw material-intensive technologies that are essential to the energy transformation and the Green Deal.

iCRAG has been involved in examining lithium potential in Ireland and is also conducting research to determine what additional critical raw materials for energy decarbonisation may be present on the island. Further research to define potential critical raw materials sources in Ireland can aid society in planning for the future.

4.1.2 INCREASING AWARENESS AND PARTICIPATION

Critical to the development of mineral exploration and mining efforts in Ireland is a more human-centered approach which is required if mining projects are to achieve

environmental-socio-economic viability. This includes conducting research into the values, trade-offs and beliefs that play a role in decision making about mineral exploration and mining, allied to the contested choices associated with climate action measures. Further research on ensuring good communication and the transparent flow of information between all parties is also essential. iCRAG is actively involved in such research and believes significantly more is required and that such studies must include community engagement and involvement.

4.1.3 SUSTAINABLE DEVELOPMENT

Provision should be made to allow preservation of and access to data and samples from former mine sites for research purposes, especially to mine sites where there may be potential to extract essential minerals from tailings/spoil heaps. This is particularly important in ensuring that former mine sites can contribute to the circular economy model. There is also a critical need to strengthen and augment the work of Geological Survey Ireland in the creation of significant knowledge of Ireland's mineral resources and its subsurface to allow for effective planning for future development of all types.

4.1.4 BUILDING CAPACITY AND ACCESS TO KNOWLEDGE

Ensuring that a skilled mining and exploration workforce is available is critical to he continued development of the mining sector of the economy as well as providing pathways to skilled jobs in the broader minerals industry worldwide that can benefit Ireland's economy through Irish-based SMEs and other companies. In particular, a focus should be on equipping geologists, engineers, and social scientists at third level with the necessary skills and expertise needed in mineral exploration and mining that will allow the sector to reduce its environmental and social footprint and contribute to, and catalyse, the achievement of net climate neutrality by 2050. iCRAG is playing a pivotal role in building such capacity across the Irish mineral exploration and mining space through the Centre's Research Challenges, in particular its Earth Resources Challenge which has a significant focus on minerals research. The Centre uniquely combines the three main groups of collaborators necessary for both the performance and implementation of world-leading research (universities, industry and government) across eight partner institutions, providing the necessary support and structure for scientists and engineers to perform large-scale multi-disciplinary research projects between the various sectors of the mineral exploration and mining industries. iCRAG's interdisciplinary and diverse team continues to develop a pipeline of experienced researchers focused on the development of innovative mineral exploration and mining technologies and methods with a lower impact on the social and

physical environment. Furthermore, knowledge transfer and placement programmes, such as the industry and government placement of iCRAG and other researchers, are critical in ensuring that cutting edge techniques developed through research can be implemented in an applied setting.

4.2.1 BUILDING PUBLIC UNDERSTANDING AND TRUST

The creation of a minerals communication strategy by DECC on mineral exploration, community participation in the decision-making process and the role of minerals in the green transition is welcome. Social acceptance of mineral projects is an important precondition to access primary raw materials. People make complex choices based on their values and beliefs yet a gap in knowledge exists on which values are prioritised in the context of critical raw materials. As research emerges to fill this gap, DECC's minerals communication strategy should reflect not just how mining works, but also how people think and feel about mining, with communication strategies tailored accordingly. It will be critical to ensure involvement in this strategy by community and local groups.

iCRAG welcomes the establishment of a minerals exploration and mining advisory group and would be pleased to share its academic expertise and research findings with this group as appropriate.

4.2.3 RESEARCH ON THE ROLE OF MINERALS IN THE TRANSITION TO NET-ZERO GREENHOUSE GAS EMISSIONS BY 2050

The inclusion of further research topics enumerated in the draft policy statement is welcome and should also include research into beneficial use and utilisation of mine wastes (rock and tailings) and improvement of zinc batteries. Engagement with the broad range of social sciences and humanities is a critical area of research and in particular sufficient funding should be provided to advance our understanding of topics at the intersection of the social sciences and humanities with the geosciences.

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