

# SEG 2024 Conference: Sustainable Mineral Exploration and Development

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## National-Scale Critical Mineral Assessments to Support Accelerating Discovery in Australia

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The production of critical and strategic minerals will be key for the transition to net zero and will require increased rates of discovery to support the provision of feedstock into the earliest stages of the supply chain. Given the importance of critical and strategic minerals to the Australian national economy, a series of national-scale mineral potential assessments have been undertaken as part of the Exploring for the Future program at Geoscience Australia to support exploration, search space reduction, and discovery. These assessments focus on delineating prospective belts or districts that indicate the presence of favourable mineral system processes, derived from both new and legacy geological, geophysical, and geochemical data sets acquired as part of precompetitive geoscience programs at the national scale. Assessments have been undertaken for sediment-hosted base metal, carbonatite-related rare earth element, and iron oxide-copper-gold mineral systems in Australia. Additional national-scale assessments are currently underway for high-purity silica and other rare earth element mineral systems as part of Geoscience Australia's involvement in the Australian Critical Minerals Research and Development Hub. Such assessments are underpinned by high-quality precompetitive geoscience data and mineral systems understanding, which often comes from compilation of global-scale data sets, such as the Critical Minerals in Ores database, and understanding of the formation of mineral systems in a global context, which are then integrated using appropriate methodologies, including a newly developed hybrid data- and knowledge-driven approach for mineral potential mapping, to generate robust mineral potential maps that delineate the most geologically prospective areas. This presentation will highlight Geoscience Australia's work on delivering national-scale mineral potential assessments to support an improved understanding of Australia's critical minerals inventory.