



Department of Mines,
Petroleum and Exploration



Five-Year Geoscience Plan 2026–31

June 2026



Acknowledgement

The Department of Mines, Petroleum and Exploration (DMPE) respectfully acknowledges Aboriginal peoples as being the traditional custodians of Western Australia. We acknowledge the enduring connection Aboriginal people continue to share with the land, sea and sky through both their ancestral ties and custodianship to Country. We pay our respect to Elders both past and present, and acknowledge the value brought to our department through the collective contribution of Aboriginal and Torres Strait Islander peoples across Western Australia.

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Foreword

Has there ever been a more consequential moment for Western Australia?

What we possess and are capable of has never been in question. But the world is moving fast, and energy security, decarbonisation and strategic technologies now sit at the centre of every serious decision. The question is no longer what we do. It's why we do it, how far we're prepared to take it, and what it will take to get there.

That's what this plan is about.

But my challenge to you, as you read the compelling case made by GSWA, is to think even bigger. Instead of being one of the key players in this new world order, what if we were the most important? Silicon Valley owns the word "tech." Western Australia should own the word that matters more this century – energy. Take that leap, tell the story well, lead with genuine conviction and imagine the impact we could make.

With the finest data and knowledge at our disposal, we won't just power a thriving economy for decades to come. We'll draw in the sharpest minds, the most serious investors, and become the engine that drives everything else.

None of this is new. WA is already kicking goals. But imagine if we were more intentional about the work we do, the expertise we hold, and the value it creates. That shift, from taking our advantages for granted to deliberately nurturing them, is what turns potential into true leadership. A clear vision gives everyone something to get behind, and it's what will make the world sit up and take notice.

Complacency is not a strategy. This is our moment.

This plan shows us how to get there.

James Lush

Corporate Adviser, former ABC and BBC Broadcaster.

Building the foundations for Western Australia's future

The Geological Survey of Western Australia (GSWA) is a world-leading public geoscience organisation that provides objective, authoritative data and knowledge to support the responsible use of the State's natural resources. For more than a century, GSWA has been the trusted custodian of Western Australia's geological information, ensuring that the State's scientific foundations remain rigorous, coherent and up to date.

What GSWA does

GSWA's work spans three core scientific activities:

- acquisition of high-quality geoscientific data;
- generation of information and knowledge through rigorous, evidence-based science; and
- delivery of accessible geoscience data and products for government, industry, researchers and the community.

Together, these activities build a State-scale understanding of Western Australia's geology, from areas of current economic importance to regions that may become significant in the future. In doing so, GSWA creates enduring public geoscience assets that provide a trusted foundation for exploration, planning, regulation and community understanding of WA's globally significant geology.

Custodians of WA's geological framework

GSWA maintains the integrity of the State's:

- stratigraphic nomenclature;
- geological frameworks; and
- tectonic models.

This stewardship ensures that industry, government and academic researchers can rely on stable, authoritative reference systems for exploration, regulation and long-term resource management.



The value of pre-competitive geoscience data

Pre-competitive geoscience data is one of the most powerful tools available to governments seeking to stimulate exploration and diversify their economies. High-quality baseline geological information reduces exploration risk by lowering uncertainty, reducing costs, and encouraging private investment. By de-risking the subsurface, pre-competitive geoscience data enables previously unrecognised opportunities, acting as a catalyst for emerging industries from critical minerals and geothermal energy to natural hydrogen and carbon sequestration. These data also support non-mining sectors including groundwater management, environmental regulation, land-use planning, infrastructure and energy development and geohazard assessment.

Independent economic analyses consistently show a significant return on investment, adding value to the national economy through:

- stimulating exploration activity;
- creating jobs;
- attracting international investment;
- enabling earlier more efficient discoveries;
- increasing royalties and tax revenue; and
- reducing financial risk for explorers.

Why it matters now more than ever

The global shift toward renewable energy and decarbonisation, supply chain resilience, strategic technologies and energy security has dramatically increased demand for:

- critical minerals;
- geological carbon storage;
- natural hydrogen;
- geothermal energy; and
- natural gas.

Meeting these needs requires new discoveries, deeper geological understanding and integrated geoscience datasets that provide information across the scale of the entire lithosphere.



Positioning Western Australia for a decarbonised future

Western Australia's resource landscape is undergoing one of the most significant shifts in its history. Climate change, population growth and geopolitical shifts are reshaping global demand for energy and raw materials. The world is rapidly moving toward low-carbon technologies, and this transition is accelerating the need for critical minerals, geological-scale carbon storage and low-emissions energy. WA is exceptionally well positioned to supply these resources but doing so requires new discoveries, deeper geological understanding and modern, integrated geoscience datasets.

Global decarbonisation efforts, rapid technological change and evolving societal expectations are transforming the types of commodities the world needs and the way governments and industry must plan for the future. Several converging forces are driving this shift:

- Climate change is driving demand for low-emissions energy systems, including natural gas as a transitional enabler.
- Critical minerals are essential for batteries, electrification, and renewable and strategic technologies.
- Hydrogen is emerging as a major future energy carrier.
- Carbon capture and storage (CCS) is becoming a central decarbonisation tool.

A strategic opportunity for Western Australia

Western Australia is exceptionally well positioned to lead in the global shift toward clean energy, critical minerals and low-carbon technologies. The convergence of national investment, state-level strategic planning and WA's unique geological endowment creates a rare moment where geoscience can directly shape the State's economic future.

Several national and state strategies place geoscience at the heart of Australia's economic and environmental future. These include:

- [Australia's Critical Minerals Strategy](#)
- [WA's Battery and Critical Minerals Strategy](#)
- [WA's Renewable Hydrogen Strategy](#)
- [WA's CCUS Action Plan](#)
- [WA's 10-Year Science and Technology Plan](#)

Together, they create a once-in-a-generation opportunity for GSWA to shape the State's transition to a diversified, low-carbon economy, while strengthening the long-term exploration ecosystem by supporting infrastructure, expertise and services required to deliver high-quality pre-competitive geoscience.

A new era for GSWA

Together, these changes mean that GSWA must evolve into a more integrated scientific organisation that delivers industry-ready content capable of supporting WA's transition to a resilient, low-carbon and knowledge-driven economy. This will require new datasets, new scientific approaches and deeper integration across disciplines. To remain effective and relevant, GSWA is reshaping its scientific focus, through the creation of five strategic themes, to meet these emerging challenges head-on. To deliver on these expectations, GSWA will:

- shift toward integrated, whole-of-Earth-systems science;
- place greater emphasis on datasets and spatial data layers that translate directly to areas of strategic significance for WA; and
- produce industry and decision-ready datasets capable of informing across exploration, investment and regulatory frameworks.

The five strategic themes

1. **Critical materials for renewable and strategic technologies**
2. **Natural energy systems and carbon mitigation**
3. **Hydrogen as a future energy source**
4. **Future resource knowledge and system foresight**
5. **Geoscience for society, safety and stewardship**

These themes ensure GSWA's scientific strengths directly support WA's economic, environmental and societal priorities.



The five strategic themes

Critical materials for renewable and strategic technologies

Purpose: Support discovery of the minerals needed for batteries, electrification and renewable technologies. This will be achieved by Identifying and mapping mineral system “components”. GSWA will:

- map WA’s deep lithospheric architecture;
- map and characterise fertile additions to WA’s lithosphere;
- define the timing and nature of WA’s geodynamic events;
- link basin evolution and inversion to lithospheric evolution;
- map and constrain the timing of regional fluid flow events;
- constrain the timing and nature of regolith and landform evolution; and
- integrate mineral dispersion pathways into distal footprint models.

Why it matters: Future discoveries will be deeper, more complex and hidden beneath cover — requiring new datasets and integrated models.

Natural energy systems and carbon mitigation

Purpose: Provide the geological knowledge needed for Carbon Capture and Storage (CCS), geothermal energy and natural gas security. GSWA will:

- define the key tectonic controls on basin evolution;
- characterise reservoirs, seals, and basin architecture;
- map and define key hydrocarbon and CCS plays;
- identify areas for strategic short-term gas, hydrocarbon and compressed air storage;
- monitor and assess seismic hazards associated with CCS; and
- assess WA’s geothermal potential.

Why it matters: For WA to become energy secure and stable, to lead and support both domestic and international decarbonisation, to optimise renewable energy systems and to be resilient to emerging sovereign-risk challenges.

Hydrogen as a future energy source

Purpose: Enable the discovery and development of natural hydrogen and helium. GSWA will:

- map potential hydrogen- and helium-generating geological systems;
- improve understanding of basin stratigraphy; and
- identify, map and assess integrity of traps, seals, and salt layers.

Why it matters: Hydrogen is central to WA’s clean-energy future and helium is critical for advanced manufacturing and high-tech applications.



Future resource knowledge and system foresight

Purpose: Provide long-range geological intelligence to guide policy and ensure GSWA's scientific priorities remain aligned with future resource and energy needs. GSWA will:

- identify emerging commodities and geological domains;
- track global trends in the mineral and energy sectors; and
- provide evidence for long-term planning.

Why it matters: WA must anticipate and capitalise on future opportunities, not just respond to current ones.



Geoscience for society, safety and stewardship

Purpose: Ensure GSWA's work delivers public value, supports community safety and protects WA's unique geological heritage. GSWA will:

- monitor and characterise WA's seismic hazards;
- maintain geological databases and improve data access;
- protect geoheritage and support geotourism; and
- improve public engagement and geoscience education.

Why it matters: WA preserves a globally unique, uninterrupted rock record that spans 4.4 billion years of Earth history including the origin of the continents and of life on Earth. This record is globally important for advancing our understanding of Earth's evolution and planetary processes and provides valuable analogues for future exploration of the Moon, Mars and beyond.



GSWA Five-Year Geoscience Plan 2026–31

Driving the Future of Western Australia's Resources

Five strategic themes

Why this matters now



Critical Minerals

Essential for the energy transition.



Carbon Capture and Storage

Enabling geological carbon storage.



Hydrogen Energy

Fuel for a clean energy future.



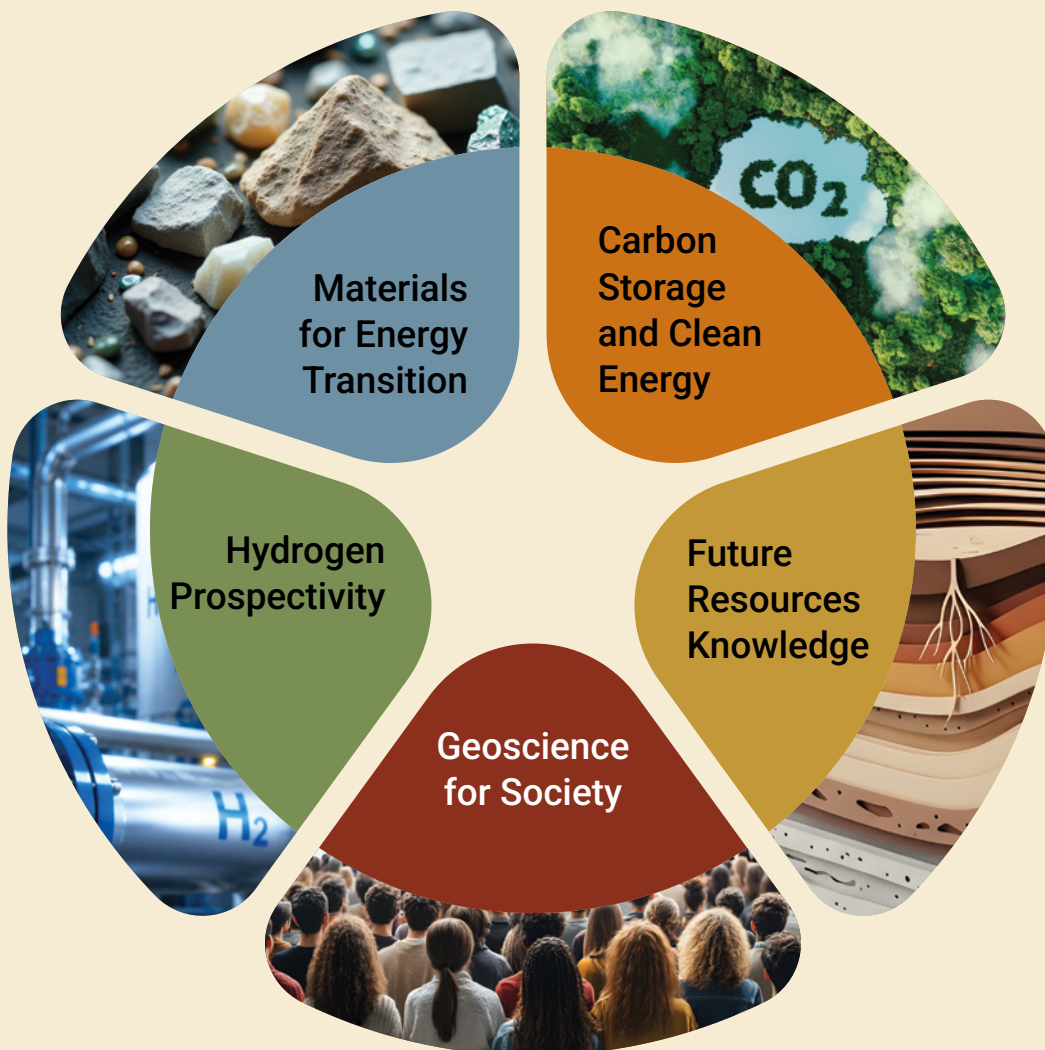
Exploration Investment

Boosting discovery potential.



Natural Hazards

Understanding and mitigating risks.



Early deliverables (years 1–2)

- WA CO₂ Storage Atlas.
- Hydrogen Prospectivity Map.
- Whole-of-Yilgarn Lithospheric Framework.
- Seismic Hazard Baseline.

Longer-term deliverables (years 3–5)

- Province-Scale Mineral System Models.
- 4D Geodynamic Maps.
- ML- and AI-Ready Datasets.
- Long-Range Foresight Products.

A Five-Year Geoscience Plan

GSWA's work program will evolve as new data, technologies and scientific insights become available. The approach will balance near-term certainty with long-term flexibility, ensuring GSWA can respond to both immediate and emerging opportunities and State priorities:

- **Years 1–2:** Operational – The focus is on projects and activities where organisational and government needs are immediate. Budgets are reasonably well-defined and, by using existing datasets, progress is not dependent on new data acquisition programs. Early outputs are expected to inform longer term directions and unlock downstream work.
- **Year 2–3:** Transitional – Project directions may vary or projects may wind down as the work is informed by the results, learnings and data releases from the earlier operational phase.
- **Years 4–5:** Strategic and adaptive – The program is flexible allowing the continuation of projects as needed, or to pivot towards new opportunities and respond to evolving industry needs.

Data acquisition will continue across the five years, with the release of datasets enabling new downstream products and later work building on new information. This staged approach ensures GSWA delivers early value while building the foundations for long-term scientific capability.

What drives prioritisation

Many activities depend on the release of deep-Earth geophysical datasets. Early work focuses on regions where data is already available, particularly the Yilgarn Craton, its margins and overlying basins, enabling immediate integration and interpretation. As new datasets are released, GSWA will progressively expand into areas of WA where exploration potential is high but data coverage, particularly deep-Earth data, is limited.



Alignment with State priorities

The WA Government has identified several areas requiring urgent geoscientific support:

- Carbon capture and storage (CCS);
- natural gas supply;
- hydrogen and helium supply; and
- critical and battery minerals supply

These priorities guide the sequencing of GSWA's work, ensuring the State has the scientific foundations needed to make informed policy and investment decisions.

Collaboration and capability needs

GSWA recognises that delivering this plan will require collaboration across government, industry and academia. Many of the activities will benefit from shared expertise and complementary scientific capabilities. GSWA will prioritise:

- opportunities to work with partners who can enhance or accelerate delivery;
- areas where collaboration avoids duplication and maximises public value;
- where external engagement strengthens GSWA's ability to deliver integrated, high-quality geoscience; and
- leverage purpose-built spaces such as the Perth Core Library that can act as a collaborative hub for geoscience excellence.

This collaborative approach ensures GSWA remains connected to emerging science, aligned with national initiatives, and is able to respond effectively to the State's evolving needs.

Risk, impact, and public value

The work program is prioritised based on the potential to:

- reduce exploration risk;
- support regulatory decision-making;
- enable new industries;
- improve public safety; and
- deliver long-term economic benefit.

This ensures GSWA's work delivers the greatest possible benefit to Western Australia.



Work program overview

GSWA's Five-Year Geoscience Plan is designed to continue delivering value and long-term scientific capability while retaining the flexibility to address emerging opportunities and the State's priorities. The program deliberately balances early, high-impact outputs that meet urgent government needs with more advanced, integrated products that require new datasets, deeper analysis and cross-disciplinary collaboration. This staged approach ensures GSWA can support emerging industries, guide government decision-making and build the foundational knowledge needed to unlock WA's future mineral and energy opportunities.

Early deliverables (Years 1–2)

The first two years of the strategy focus on delivering high-impact, high-value products that address immediate government and industry priorities. These outputs lay the groundwork for new industries, support regulatory development and provide the essential datasets required for deeper scientific analysis. They also demonstrate early progress and build confidence in GSWA's Five-Year Geoscience Plan. GSWA will deliver:

- **WA CO₂ storage atlas** — updates and expands the current Atlas to identify the most prospective geological reservoirs for long-term carbon sequestration.
- **Hydrogen/Helium prospectivity maps** — highlights areas of the State with potential for natural hydrogen and helium generation.
- **Yilgarn Lithospheric Framework** — Integrated 3D whole-of-lithosphere framework to improve targeting of critical, strategic, and precious minerals across the Yilgarn Craton.

- **Seismic hazard baseline datasets** — establishes foundational information for public safety, infrastructure design and hazard mitigation, improving the State's resilience to seismic events.
- **Integrated basin-scale geological frameworks** — delivers harmonised geological interpretations that underpin CCS, geothermal and natural gas assessments.
- **Regolith and cover mapping** — supports mineral exploration in concealed terrains.

These early deliverables provide the essential building blocks for the broader five-year program, enabling more sophisticated modelling, integration, and predictive capability in later years.



Longer-term delivery (Years 3–5)

As new datasets are collected and early work matures, GSWA will shift toward more advanced, integrated, and predictive scientific outputs. These longer-term deliverables reflect a whole-of-Earth-systems approach and will significantly enhance the State's ability to plan for future resource opportunities, manage environmental challenges and support emerging industries. These outputs will include:

- **Province-scale predictive mineral system models** — integrating lithospheric architecture, geochemistry, geophysics, and regolith data to identify new exploration opportunities across Western Australia.
- **Whole-of-lithosphere models** — combining deep-Earth imaging with surface geology to reveal the structures, processes and pathways that control mineral, energy, and groundwater systems.
- **Updated editions of the CO₂ Storage atlas and secondary resource assessments** — incorporating new data, refined interpretations and expanded coverage to support ongoing CCS and circular-economy development.
- **Machine-readable, AI-ready datasets** — enabling automated analysis, advanced modelling and modern exploration workflows across the resources sector.
- **Long-range foresight products** — providing strategic insights into emerging commodities, future exploration frontiers and long-term resource opportunities, helping government and industry plan with confidence.

These longer-term outputs ensure GSWA remains responsive, forward-looking and aligned with the State's long-term economic and environmental goals. They also position WA to take advantage of new technologies, new industries and new scientific capabilities as they emerge.



GSWA detailed work program



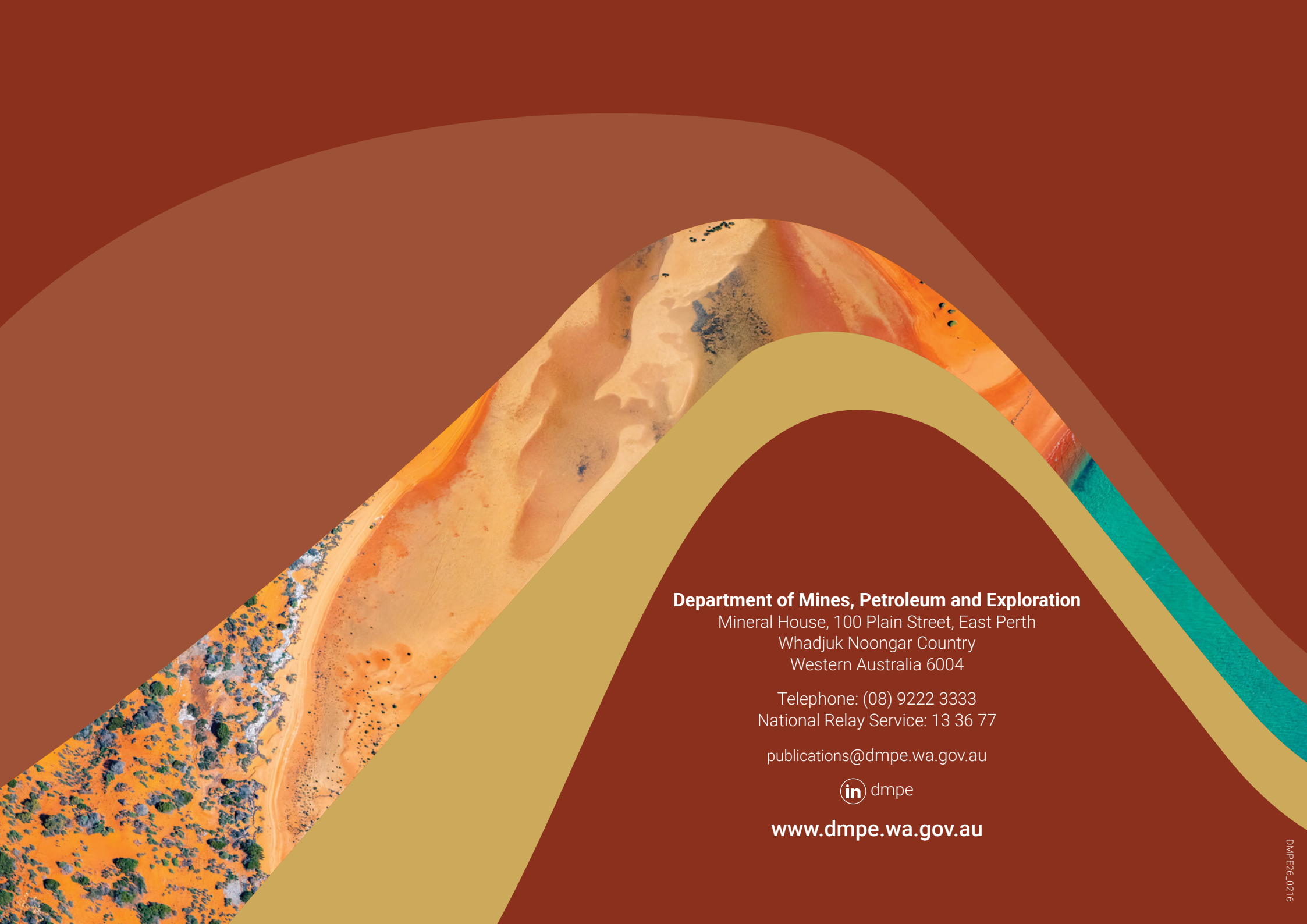
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Geoscience Strategy Update 2026–31



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