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ORPHEUS URANIUM LTD

Building a Geologically Relevant Uranium Exploration Portfolio:

Key Ingredients for Discovery in South Australia

Isaac Lord & Hugo Madezo



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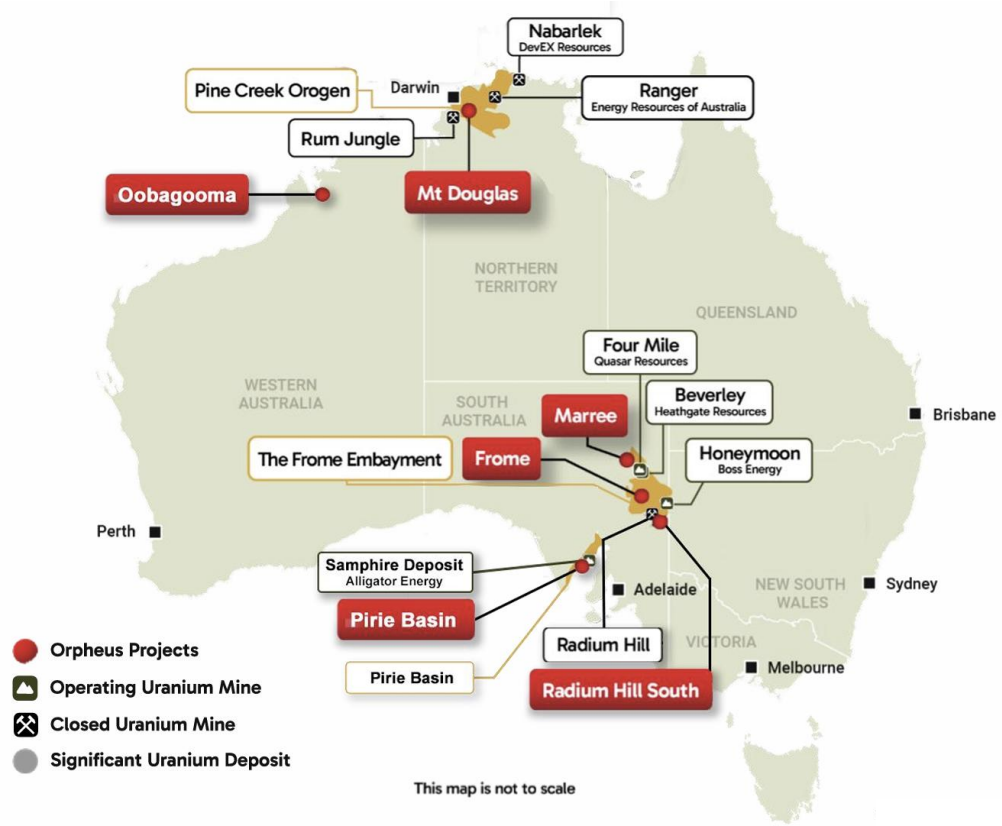
Competent Person Statement

Sections of information contained in this report that relate to Exploration Results were compiled or reviewed by Mr Isaac Lord BSc (Hons), who is a Member of Australian Institute of Mining and Metallurgy, and is a full-time employee of Orpheus Uranium Limited. Mr Lord has sufficient experience which is relevant to the style of mineral deposits under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 edition of the "Australasian Code for Reporting of Mineral Resources and Ore Reserves". Mr Lord consents to the inclusion in this report of the matters based on this information in the form and context in which it appears.

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Introduction

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VISION: ORPHEUS WORKING TOWARDS DISCOVERY AND DELINEATION OF *20 MLBS (+) URANIUM DEPOSITS*

A Portfolio Built for Discovery

- **ASX-listed Australian uranium exploration company with a diversified uranium exploration portfolio** across South Australia, Northern Territory and Western Australia.
- **A combination of emerging and historically explored districts**, where existing drilling, geophysics and geological datasets can be reinterpreted using modern exploration concepts.
- **Strategically positioned within or adjacent to proven uranium systems**, particularly **palaeochannel and sandstone-hosted mineralisation** across the South Australian portfolio.
- **Led by an experienced uranium team**, combining strong technical expertise with experience across exploration and world-class uranium operations.

The objective is not simply to acquire prospective ground, but to build a portfolio where the geological ingredients for discovery can be identified, tested and progressively refined.

Overview: Project Pipeline

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Business Development (incoming Assets) →

- **Mt Douglas** (NT)
- **McArthur** (NT)
- **Mundaerno** (SA)
- **Pirie Basin** (SA)
- **Maree*** (SA)
- **Frome** (SA)
- **Oobagooma*** (WA)
- **Radium Hill South** (SA)

→ **Producing Assets**



01. Greenfields Exploration → 02. Advanced Exploration → 03. Exploration Target → 04. JORC Resource



ORPHEUS WORKING TOWARDS DISCOVERY AND DELINEATION OF *20 MLBS (+) URANIUM DEPOSITS*

CY2026-2027 deliverables: Complete Oobagooma Acquisition and Establish Exploration Target, Complete Inaugural Frome Drilling with intention to work towards establishing exploration target, Inaugural Drilling at Pirie Basin and/or Marree, Continue developing NT Assets

* Sale agreement executed, working to completion of sale

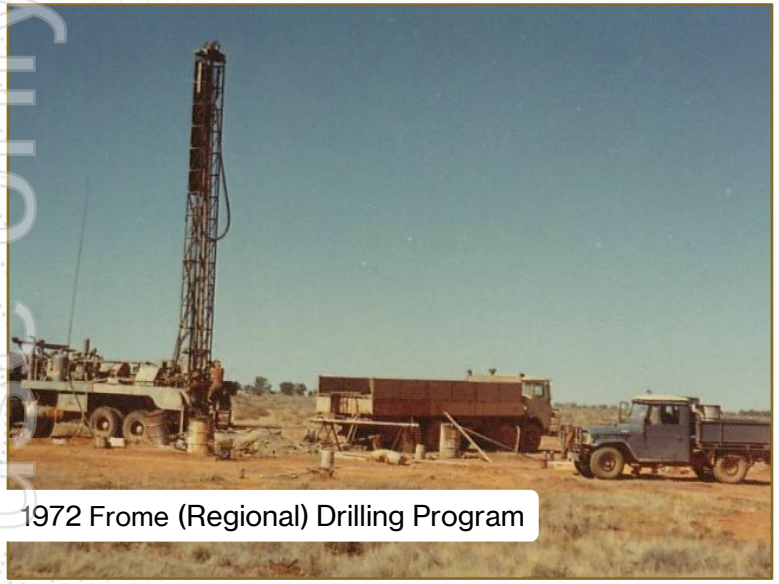
The Uranium Cycle

Discoveries Through Time

**AS AN INDUSTRY,
WHEN WE EXPLORE FOR URANIUM,
WE DISCOVER URANIUM!**

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1970's & 1980's	2000's	2020's



1972 Frome (Regional) Drilling Program



2008 Frome Drilling Program



2026 Frome Drilling Program

= SA

- 1969 Ranger
- 1969 Beverley
- 1970 Koongarra
- 1970 Narbalek
- 1971 Jabiluka
- 1972 Honeymoon
- 1973 Gould's Dam
- 1974 Manyingee
- 1976 Kintyre
- 1980 Oobagooma
- 1982 Oban
- 2005 Four Mile East
- 2005 Four Mile West
- 2007 Blackbush
- 2008 Thunderball
- 2009 Pepegoona
- 2011 Pannikan
- 202*x* New Discovery?

Year of discovery for select South Australian, Northern Territory & Western Australian Uranium Deposits & Prospects

Development of nuclear energy

Renaissance of nuclear power

2011 Fukushima

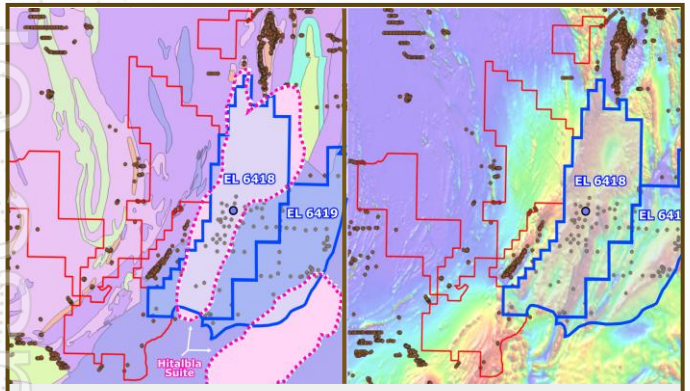
Decrease in U stockpiles

Major events driving Uranium Markets

From Prospective Ground to Testable Opportunities

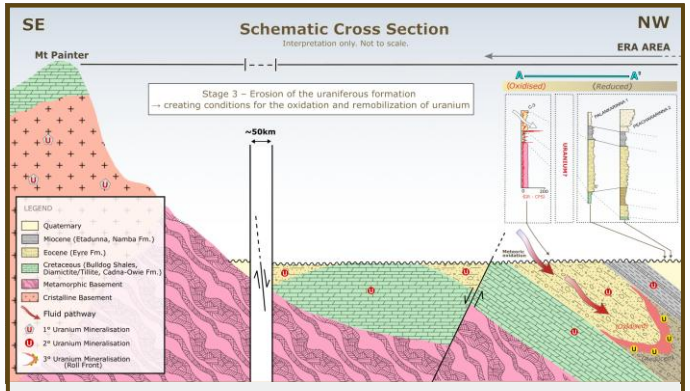
The key is translating **geological potential** into **coherent and testable exploration concepts**

01. PROSPECTIVITY



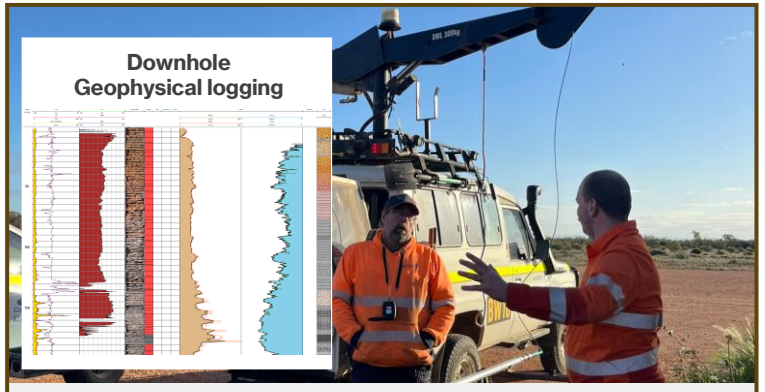
Historical data analysis provides the foundation for project-scale exploration

02. GEOLOGICAL HYPOTHESIS



A mineral system model brings together key geological processes required for uranium mineralisation

03. TESTABILITY



Prioritisation of drill-ready targets with clear criteria for testing and refinement

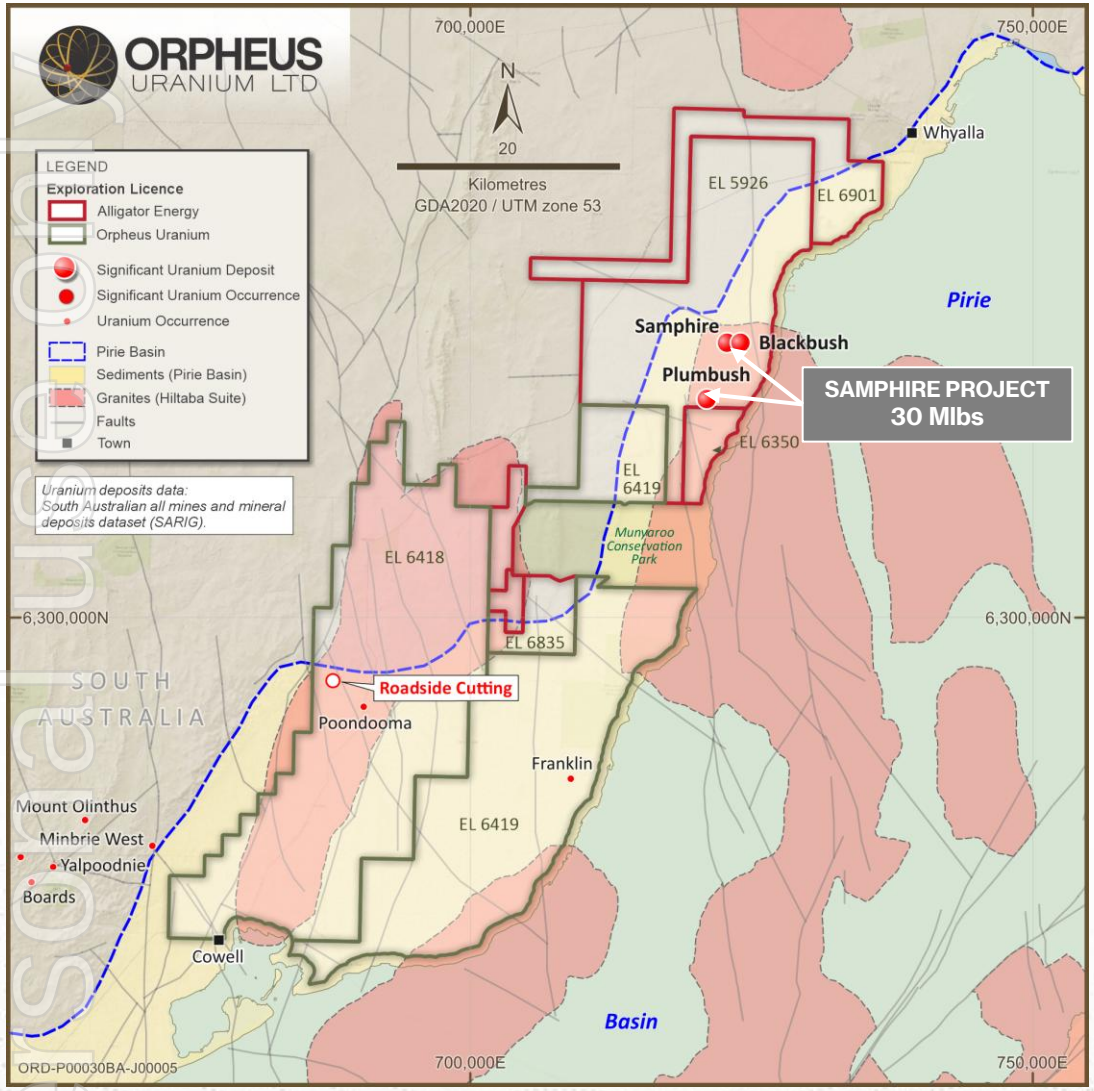
- Historical and modern datasets allow our team to **develop, challenge and refine geological hypotheses** across the portfolio.
- Projects are progressively ranked around **geological relevance** and the ability to **define clear exploration target areas.**

A quality exploration project is not defined by where it is - but by the strength and testability of the geological model behind it

Orpheus Uranium Ltd

Pirie Basin Project: Defining the Exploration Opportunity

From regional prospectivity to project-scale targeting



PROSPECTIVITY



Paleochannel Incision



Outcropping Pirie Basin Sediments

Ingredients for discovery

40km of Pirie Basin sediments, overlying fertile Hiltaba Suite granites, basin margin position providing transport pathways from oxidized to reduced domains.

Known Deposit Hosting Sediments

Kanaka Beds known to host mineralisation (Samphire Project – 30 Mlbs U_3O_8[1]). Geological synergy with Orpheus' exploration tenure.

High-Potential - Incomplete Testing

Limited uranium focused exploration completed historically. Work ceased due to market conditions rather than geological prospectivity.

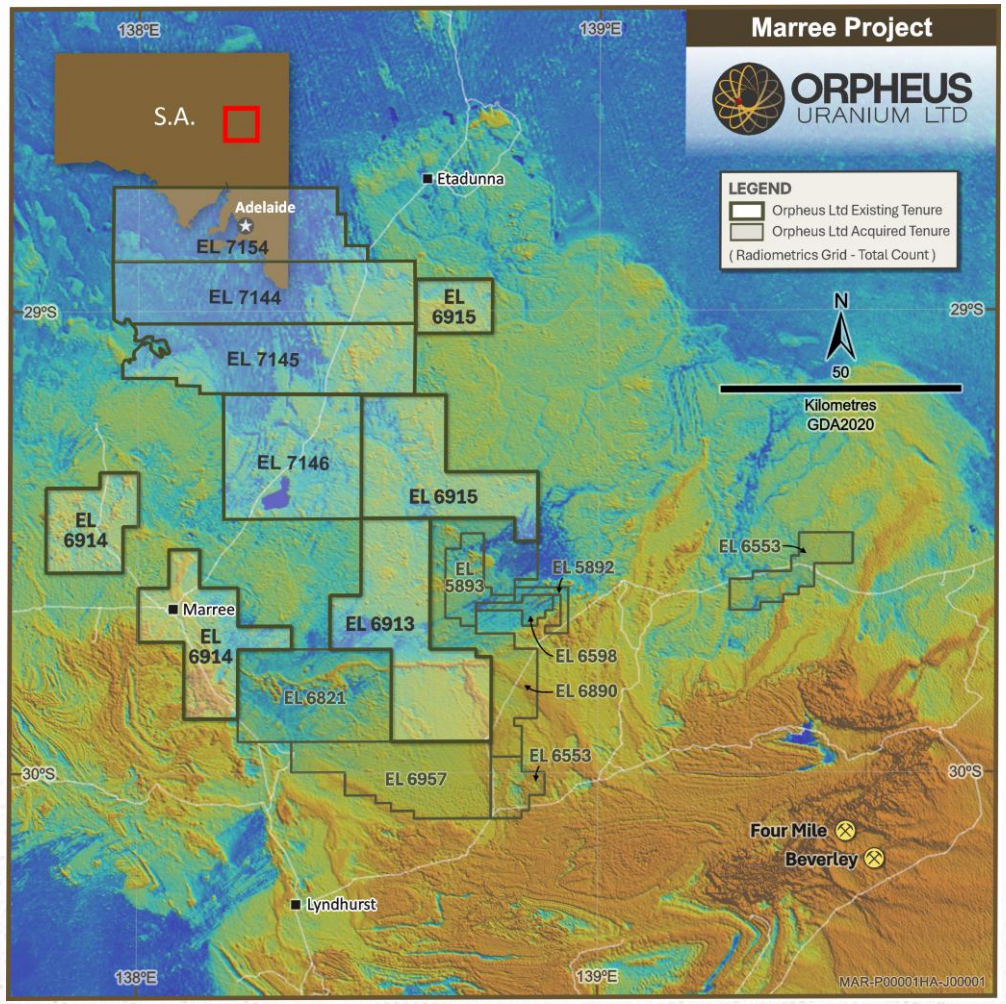
1. Plumbush Uranium Deposit – Alligator Energy Limited ASX: AGE – Samphire Mineral Resource Grows 67% to 30 Mlbs U_3O_8 Following Addition of Plumbush Inferred Mineral Resource (12.0 Mlbs. at an average grade of 370ppm U_3O_8). Refer to ASX: AGE announcement dated 19 June 2026

Marree Project: Building the Geological Hypothesis

A district-scale system with strong transport potential

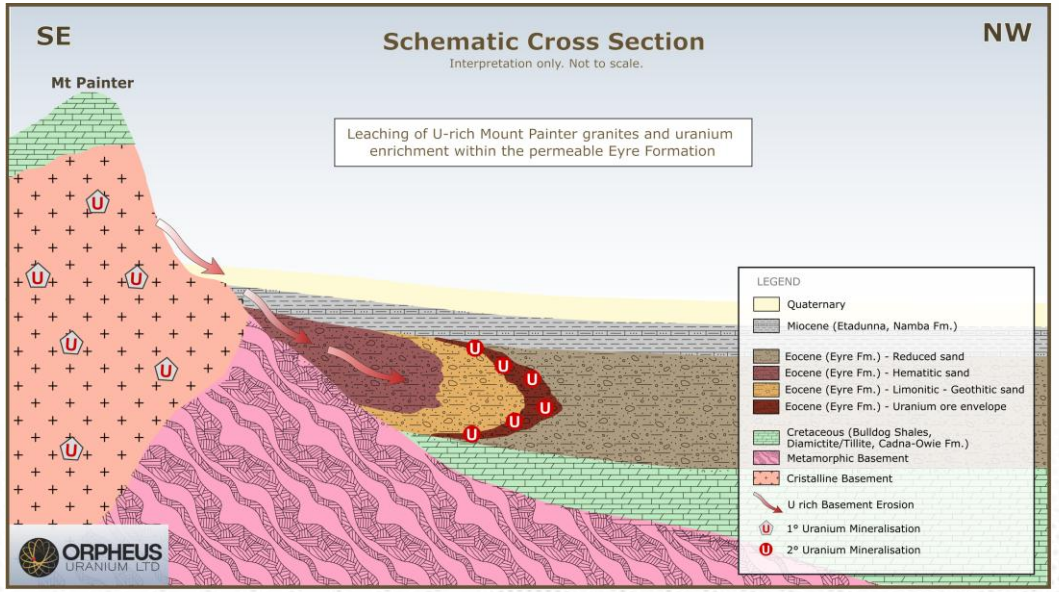
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GEOLOGICAL HYPOTHESIS



CONVENTIONAL MODEL

- **High grade** regional sources from the northern Flinders Ranges.
- **Prospectives sediments** of the Lake Eyre Basin a known host to significant Uranium mineralisation (Four Mile, Honeymoon & Gould's Dam).
- **Uranium mineralisation** controlled by historical and contemporary ground water flow directions.

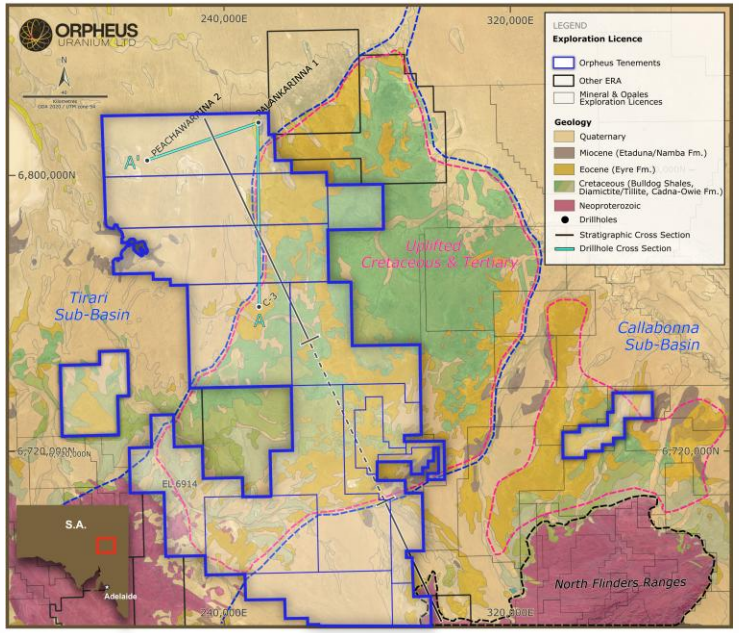


Marree Project: Building the Geological Hypothesis

A district-scale system with strong transport potential

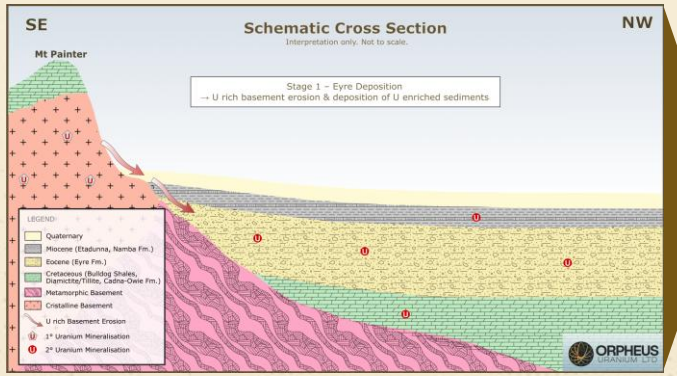
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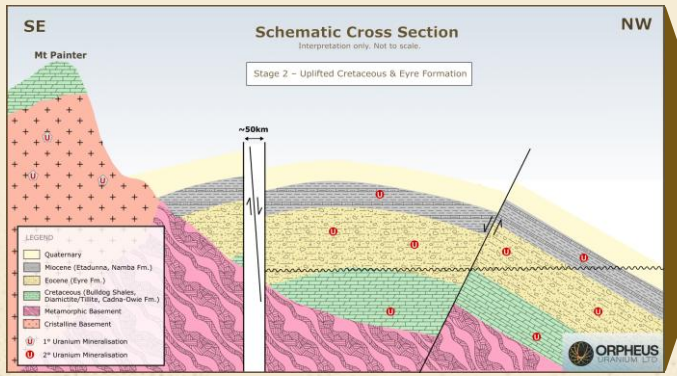
GEOLOGICAL HYPOTHESIS

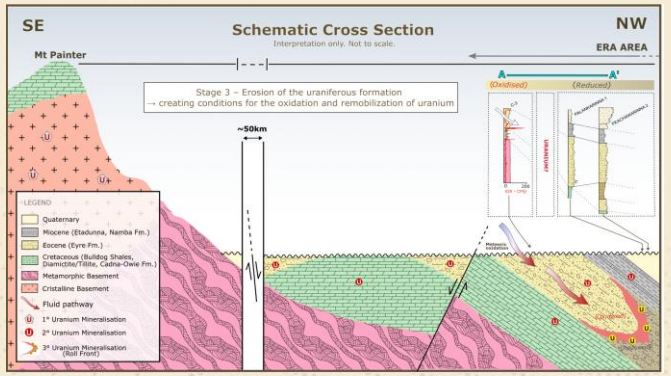


ALTERNATIVE MODEL

- **Deposition & primary U input:** Deposition of the basin succession, with uranium supplied by erosion and weathering of the Flinders Ranges and incorporated into Eyre Formation and potential Cretaceous sediments.
- **Uplift & basin reorganisation:** Post-depositional uplift of the Cretaceous–Cenozoic succession modifies the basin architecture.
- **Erosion, fluid flow & redox trapping:** Erosion locally exposes the Eyre Formation, allowing infiltration of oxidising meteoric groundwater and U remobilisation along permeable horizons, with potential roll-front precipitation at redox fronts.



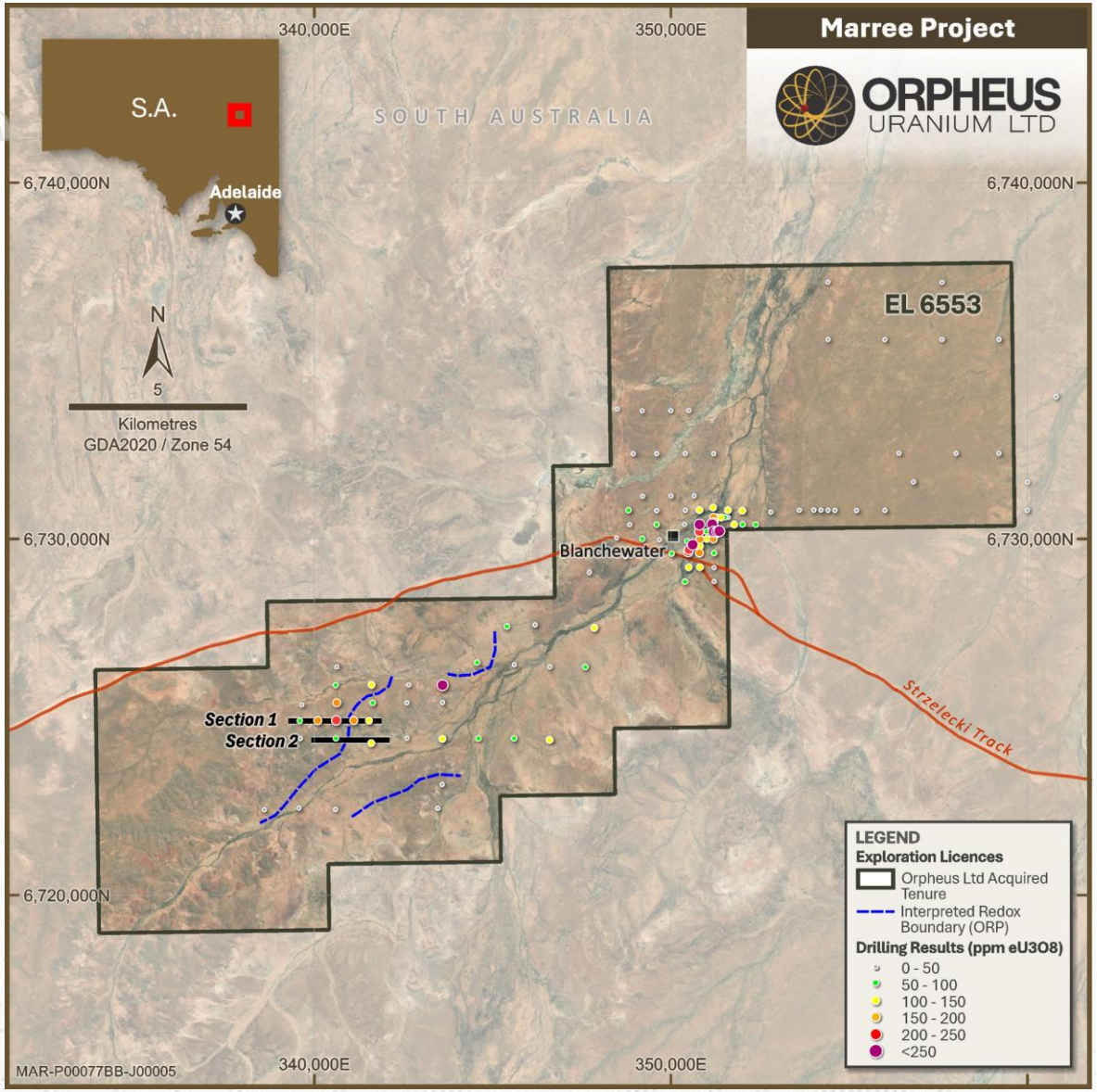


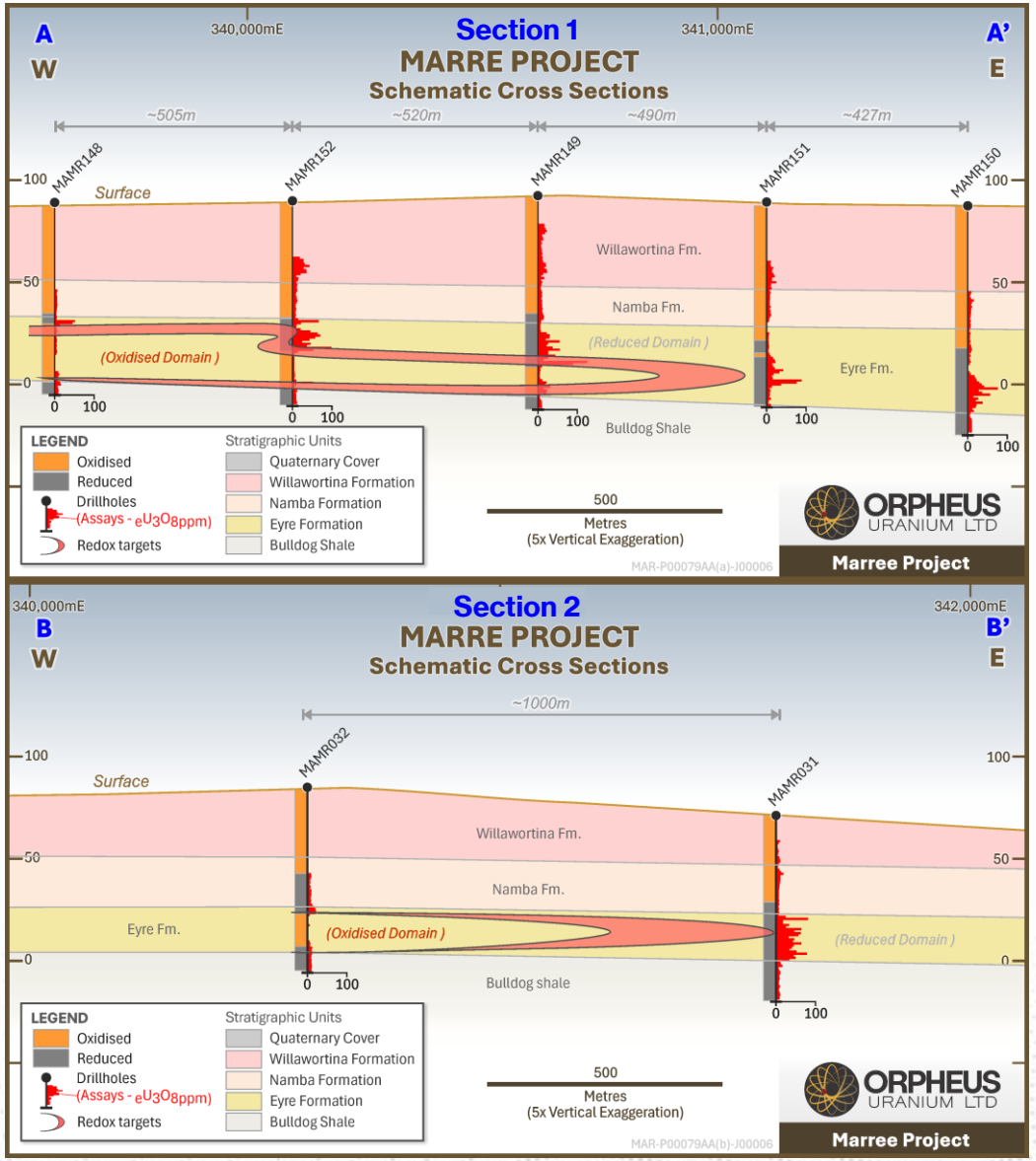


Marree Project: Building the Geological Hypothesis

A district-scale system with strong transport potential

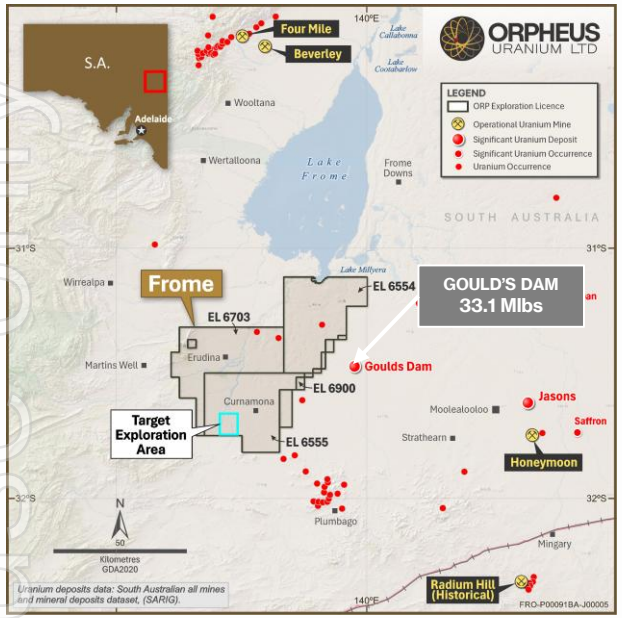
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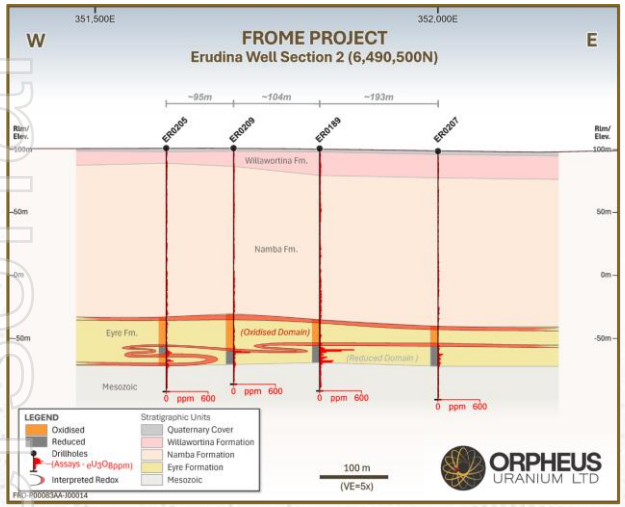




Frome Project

Testing the geological model through drilling and downhole data

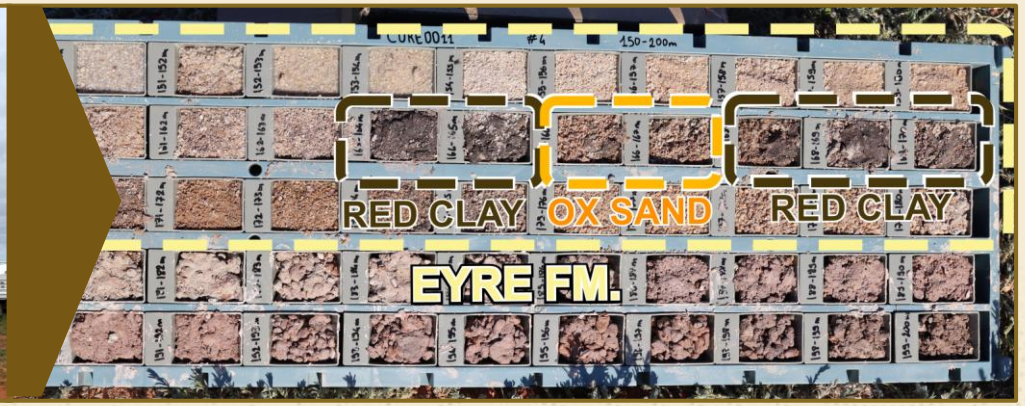




TESTABILITY

- Project area identified and drilled by Areva (Orano) in 2007-08 with wide spaced grid patterns (1km spaced lines) intersecting >1,000ppm eU3O8 intervals in the Eyre Formation. Global Financial Crisis and unfavourable U market conditions resulted in the incomplete testing of the Erudina Prospect.
- Potential source (Crocker Well), transport and trap mechanisms share the geological synergy with the developing Gould's Dam uranium deposit (33.1 Mlbs U3O8[2]), supporting the targeting of prospective redox boundaries.
- Leveraging historical results and internal knowledge developed through experience on world-class uranium deposits, Orpheus is maximising the potential for discovery.





2. Gould's Dam Deposit – Boss Energy Limited ASX: BOE – Gould's Dam and Jason's Deposit Mineral Resource and Permitting Update (33.1 Mlbs. at an average grade of 388ppm U3O8). Refer to Refer to ASX: BOE announcement dated 19 March 2026

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Summary

As a company how do we position ourselves in the best place for discovery?

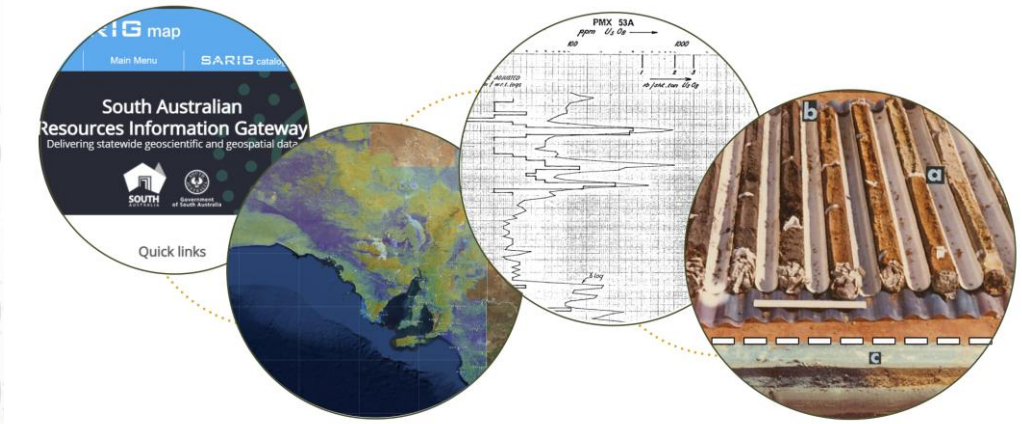
We have identified the project potential – now it is time to test our geological hypotheses

- Re-evaluating conventional and unconventional exploration models
- Consolidating opportunities across district-scale basins and geological provinces
- Feeding new opportunities and geological concepts into our project portfolio

01. Identify the opportunity | **02. Build the geological hypothesis** | **03. Define & test the target**

HISTORICAL DATA REVIEW

HISTORICAL DRILLHOLE INTERPRETATION



REGIONAL PROSPECTIVITY ANALYSIS

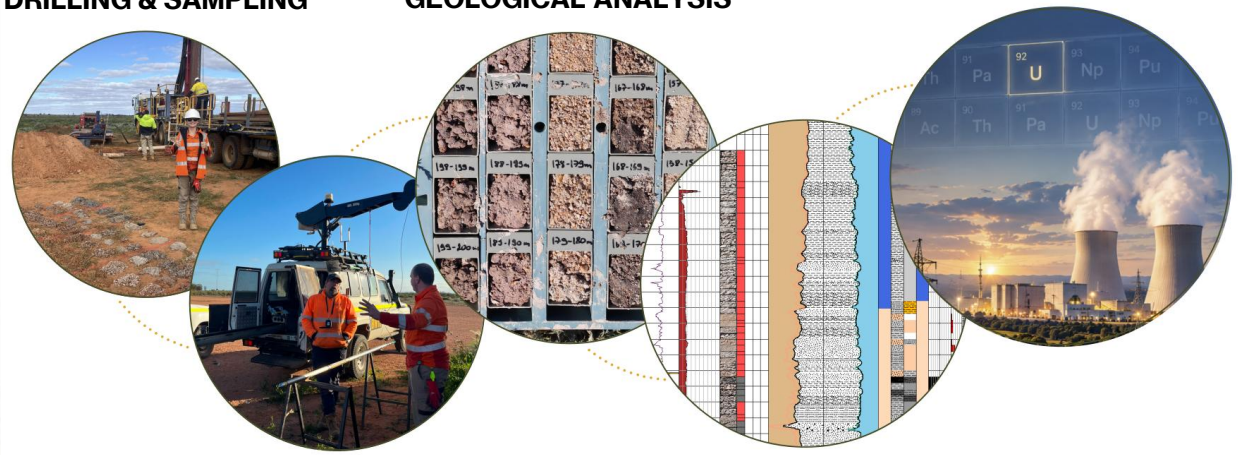
GEOLOGICAL MODEL DEVELOPMENT

PROJECT GENERATION

DRILLING & SAMPLING

GEOLOGICAL ANALYSIS

FROM DISCOVERY TO A CLEANER FUTURE



DOWNHOLE GEOPHYSICS

DATA INTEGRATION & REINTERPRETATION

IMPLEMENTATION

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Comparable Projects

Orpheus reports Mineral Resources of uranium mines, deposits or past production that it considers comparable to the style and location of uranium mineralisation in which it explores, as presented within this presentation, and listed in the table herein.

Project	Development Phase	Location	Company / Operator	Resource Classification	Average Grade (ppm U_3O_8)	Contained Metal (Mlbs, U_3O_8)	Source
Honeymoon Uranium Mine	Mine	Lake Eyre Basin/Callabonna Sub-basin South Australia	Boss Energy Limited ASX: BOE	Mineral Resource	660	36	*Refer to ASX: BOE announcement dated 23 January 2024* *Note: 2021 Enhanced feasibility study (EFS) withdrawn in 2025 - Refer to ASX: BOE announcement dated 18 December 2025*
Jasons Uranium Deposit	Resource			Combined Indicated and Inferred Resource	410	12	Refer to ASX: BOE announcement dated 19 March 2026
Goulds Dam Uranium Deposit	Resource			Combined Indicated and Inferred Resource	388	33.1	Refer to ASX: BOE announcement dated 19 March 2026
Saffron Deposit	Resource		Marmota Limited ASX: MEU	Inferred Resource	557	5.4	Refer to ASX: MEU announcement 26 October 2023
Radium Hill Historic Mine	Historic Mine	Curnamona Province South Australia	Areas reserved from the Mining Act, 1971 and Opal Act, 1995	Past production	1,310	2.6	Refer to https://minerals.sarig.sa.gov.au/MineralDepositDetails.aspx?DEPOSIT_NO=962
Samphire Uranium Deposit (Blackbush)	Resource	Pirie Basin (Eyre Peninsula)	Alligator Energy Limited ASX: AGE	Combined Indicated and Inferred Resource	676	18	Refer to ASX: AGE announcement dated 06 May 2025
Plumbush Uranium Deposit (broader Samphire Project)	Resources		Alligator Energy Limited ASX: AGE	Inferred Resource	370	12	Refer to ASX: AGE announcement dated 19 June 2026

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