Well correlations and age constraints reveal emerging resource potential in the Birrindudu Basin region

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Introduction

The *Resourcing Australia's Prosperity* initiative is a landmark investment, by the Australian Government, to sustain and improve Australia's position as a global renewable energy leader, by ensuring a pipeline of economic resources and enabling the responsible management of all resources. The initiative is a 35-year investment (2024–59) to deliver accelerated and enhanced geoscience data acquisition, scientific analysis and decision-support tools (Henson *et al* 2025). As one of the first 'deep dives' to assess prospectivity in particular regions, the Birrindudu Deep Dive project aims to improve understanding of the under-explored Birrindudu Basin region, which has significant resource potential and displays similar characteristics to many world-class resource regions in northern Australia.

The Birrindudu Basin is one of northern Australia's most under-explored Proterozoic basins despite its position within a broader Palaeoproterozoic–Mesoproterozoic greater McArthur Basin framework that includes the resource-rich McArthur Basin and Tomkinson Province. Although its sedimentary successions have long been recognised for their geological complexity, sparse drilling, limited seismic exploration, heterogeneous datasets and complex overprinting of younger basins have impeded the development of a coherent basin model. As a result, the Birrindudu Basin's mineral and energy potential has remained poorly constrained compared to neighbouring basins that host world-class metallogenic systems. Recent acquisition of analytical datasets and improved basin-scale compilations has transformed our ability to interpret how the basin evolved and to link its stratigraphy and basement units with neighbouring resource-rich regions such as the McArthur Basin and Mount Isa Province.

Advances in multi-well stratigraphic correlation, U–Pb zircon geochronology, and mineralogical and geochemical datasets now enable a more robust reconstruction of depositional timing, stratigraphic continuity and basin evolution. This study uses stratigraphic, geochronological and mineralogical datasets from 26 stratigraphic and mineral exploration wells to refine understanding of the stratigraphy of the Birrindudu Basin region. By combining sedimentary facies and lithofacies interpretations, HyLogger mineralogy, new clay-ratio (pseudo-gamma) curve and self-organising map clustering results, geochemistry, fluid inclusions and high-precision U–Pb zircon ages, an updated cross-basin correlation framework has been expanded, resolving long-standing mismatches in unit equivalence and clarifying the depositional chronology. The resulting stratigraphic model provides improved constraints on the distribution and continuity of stratigraphic units, and highlights new corridors of potential prospectivity. These insights re-establish the Birrindudu Basin region as a genuinely prospective basin with significant implications for mineral exploration.

Birrindudu Basin

The Birrindudu Basin extends across a large part of northwestern Northern Territory and into northeastern Western Australia (**Figure 1**) and forms part of a broader Palaeoproterozoic–Mesoproterozoic system contiguous with elements of the McArthur Basin and Tomkinson Province (Henson *et al* 2025). Definition of the basin has evolved through increased data acquisition, improving the understanding of the geology and stratigraphy (see Dunster and Ahmad 2013, Korsch 2024 for summary). The accepted basin definition is that proposed by Dunster and Ahmad (2013), where the Palaeoproterozoic to Mesoproterozoic Birrindudu Basin is distinguished from the overlying Neoproterozoic Victoria Basin (Dunster *et al* 2000) by a regional unconformity, interpreted from a major shift in detrital zircon provenance between the Tijunna Group of the Birrindudu Basin and the Auvergne Group of the Victoria Basin (Carson 2013). Under this definition, the Birrindudu Basin is considered to contain six stratigraphic groups, separated by either unconformities or disconformities, of which the two basal Birrindudu and (possibly age-equivalent) Tolmer groups lacked reliable chronostratigraphic control, which made their lateral stratigraphic correlation uncertain. These basal groups are supposedly unconformably overlain, in ascending order, by the Limbunya, Wattie, Bullita and Tijunna groups (Dunster and Ahmad 2013, Munson 2014). Rocks of the Birrindudu Basin region are considered to have been mostly deposited in shallow-marine clastic and carbonate settings, with lesser lacustrine and fluvial environments (eg Crombez *et al* 2023, Korsch 2024, Schmid and Baumgartner 2024). Rare tuffaceous rocks also occur in the Limbunya and Wattie groups. See Dunster and Ahmad (2013), Korsch (2024) and Anderson *et al* (2024) for summaries and stratigraphic columns. Rocks of the Birrindudu Basin unconformably overlie metamorphosed and deformed rocks of the Pine Creek Orogen in the north, Tanami Region in the south, the Inverway Metamorphics in the central part of the basin and probably the Halls Creek Orogen in the west (Dunster and Ahmad 2013, Korsch 2024).

Data and methods

Twenty-six stratigraphic and mineral exploration drillholes across the Birrindudu Basin region were re-evaluated by integrating:

- sedimentary facies and lithofacies logging from drillhole reports, HyLogger datasets and geological publications

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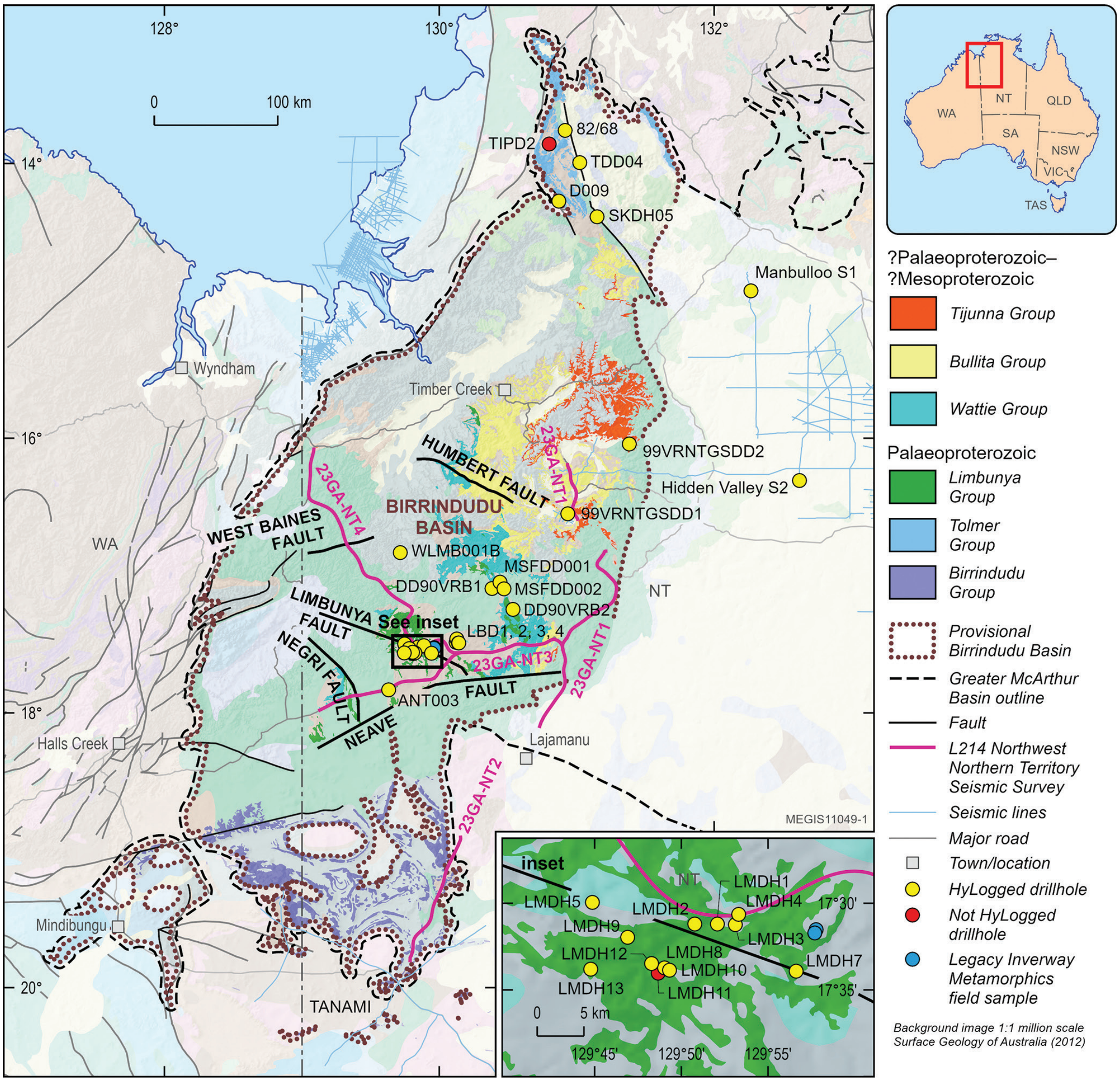


Figure 1. Regional geology, seismic lines and drillholes of interest to the study in the Birrindudu Basin.

(eg Dunster and Ahmad 2013, Crombez *et al* 2023, Munson 2023, Schmid and Baumgartner 2024)

- relative mineral abundances from HyLogger thermal infrared / short-wave infrared spectral mineralogy
- legacy and new U–Pb zircon ages from volcanic/volcaniclastic units and detrital populations (summary in Anderson *et al* 2024, Kositcin *et al* 2025, Reno *et al* 2025)
- inorganic geochemistry (portable X-ray fluorescence and inductively coupled plasma mass spectrometry) from drillhole and post-drilling reports (Foley 2024)
- fluid-inclusion stratigraphy data from five drillholes (99VRNTGSDD1, 82/68, LBD2, MSFDD001 and WLMB001B; Cowen *et al* 2024)
- petrophysical logs from two petroleum stratigraphic drillholes, Hidden Valley S2 and Manbulloo S1 (**Figure 1**), which are outside the pre-defined Birrindudu Basin (Dunster and Ahmad 2013, Foley 2024), and gamma ray / compressional wave velocity measured using hand-held tools for six drillholes (Crombez *et al* 2023)
- new clay-ratio (pseudo-gamma) curves derived from HyLogger data using –

$$\textit{clay ratio} = \frac{\textit{clay}}{\textit{silica} + \textit{feldspar} + \textit{carbonate} + \textit{clay}}$$

- petrophysical classes generated by self-organising map (SOM) clustering on the HyLogger-derived mineral profiles. (Cumulative probability curves generated from SOM clustering indicate the major class at each location, which corresponds to rock type or transition of rock types; Wang *et al* 2023).

The stratigraphic correlations were anchored by geochronological ages, especially those measured on volcanic/volcaniclastic rock samples. The above datasets were cross-checked against the CSIRO sequence stratigraphic framework proposed by Schmid and Baumgartner (2024), a recent 3D basin compilation (Foley 2024) and regional surface geological maps, allowing iterative refinement of formation tops, thicknesses and correlations.

Results

Well correlations

Re-evaluation of 26 stratigraphic and exploration wells (**Figure 1**) has substantially improved knowledge of the internal architectural framework of the Birrindudu Basin.

The strengthened correlations across the Limbunya, Wattie, Bullita and Tijunna groups reveal a far more coherent stratigraphic system than previously recognised. By integrating facies observations, HyLogger mineral indices, clay-ratio signatures (‘Clay’ in **Figures 2–4**), cumulative probability curves of petrophysical classes (‘SOM class’ in **Figures 2–4**) and elemental data, several units previously interpreted as isolated or laterally heterogeneous are now seen to be regionally persistent. These correlations resolve long-standing mismatches in unit equivalence that had propagated through earlier geological models and contributed to inconsistencies between drillhole interpretations, regional mapping and geophysical datasets.

Key wells – including DD90VRB1, DD90VRB2, LBD2, Hidden Valley S2, WLMB001B, MSFDD001, MSFDD002, LMDH4 and 82/68 – serve as anchors for establishing a basin-scale correlation framework. For example, stratigraphic tie-lines between LMDH4, LBD2, DD90VRB2 and Hidden Valley S2 (**Figure 2**) and between LBD1 and LBD2 (**Figure 3**) confirm consistent facies stacking patterns within the Limbunya Group and allow repicking of several contacts from company reports that had previously been offset by tens of metres. Revised correlations from these drillholes to other drillholes, like that seen between LMDH4 and LMDH1, LMDH5 and LMDH7 (**Figure 4**), clarify the vertical succession of Limbunya age intervals, providing updated internal markers that improve both temporal and lithological alignment. These refinements have also corrected several miscorrelations, particularly within the Margery Formation, Mallabah Dolostone and Kunja Siltstone (Limbunya Group), where HyLogger-derived mineral profiles, and clay-ratio and SOM-class curves, demonstrate diagnostic textural and mineralogical contrasts.

The contact between the Birrindudu Basin and underlying basement has been intersected in nine shallow drillholes within the central Limbunya region (LMDH8, LMDH10–13 and LBD1–4 in **Figure 1**). The underlying basement is a variable metamorphic domain, in that there is evidence of different metamorphic character, conditions and/or deformation intersected in these drillholes. Four drillholes clustered in the eastern central Limbunya area, LBD1–4, have distinctive and sometimes similar HyLogger-derived mineral profiles, clay-ratio and SOM-class curves and lithofacies logs (**Figure 3** for LBD1 to LBD2 correlation). This basement looks substantially different to the datasets intersected in a western cluster of drillholes in the central Limbunya area, LMDH8 and LMDH10–13 (**Figure 3** for LMDH8 to LMDH10) and this implies a significant shift in terrane or deformation between these drillhole clusters. The variable metamorphic terranes intersected in the drillholes are substantiated by recent geochronology from LBD2 and LMDH11.

Within the metamorphic basement, a black metapelite interval (previously described as black graphitic shale, carbonaceous mudstone or schist) in LMDH8 has also been intersected in LMDH10 and LMDH12 (**Figure 3** for LMDH8 to LMDH10). Samples from this interval have a dark, metallic, lustrous appearance (**Figure 3**) and are described in thin section as graphitic metapelite (Madden *et al* 2026) with total graphitic carbon (TGC) values of 4.9–12% (Grosjean *et al* in prep). Contrasts between and within drillhole clusters (east and west) collectively highlight the possible presence of multiple basement domains beneath the Birrindudu Basin (**Figure 3**), each recording distinct metamorphic and structural histories.

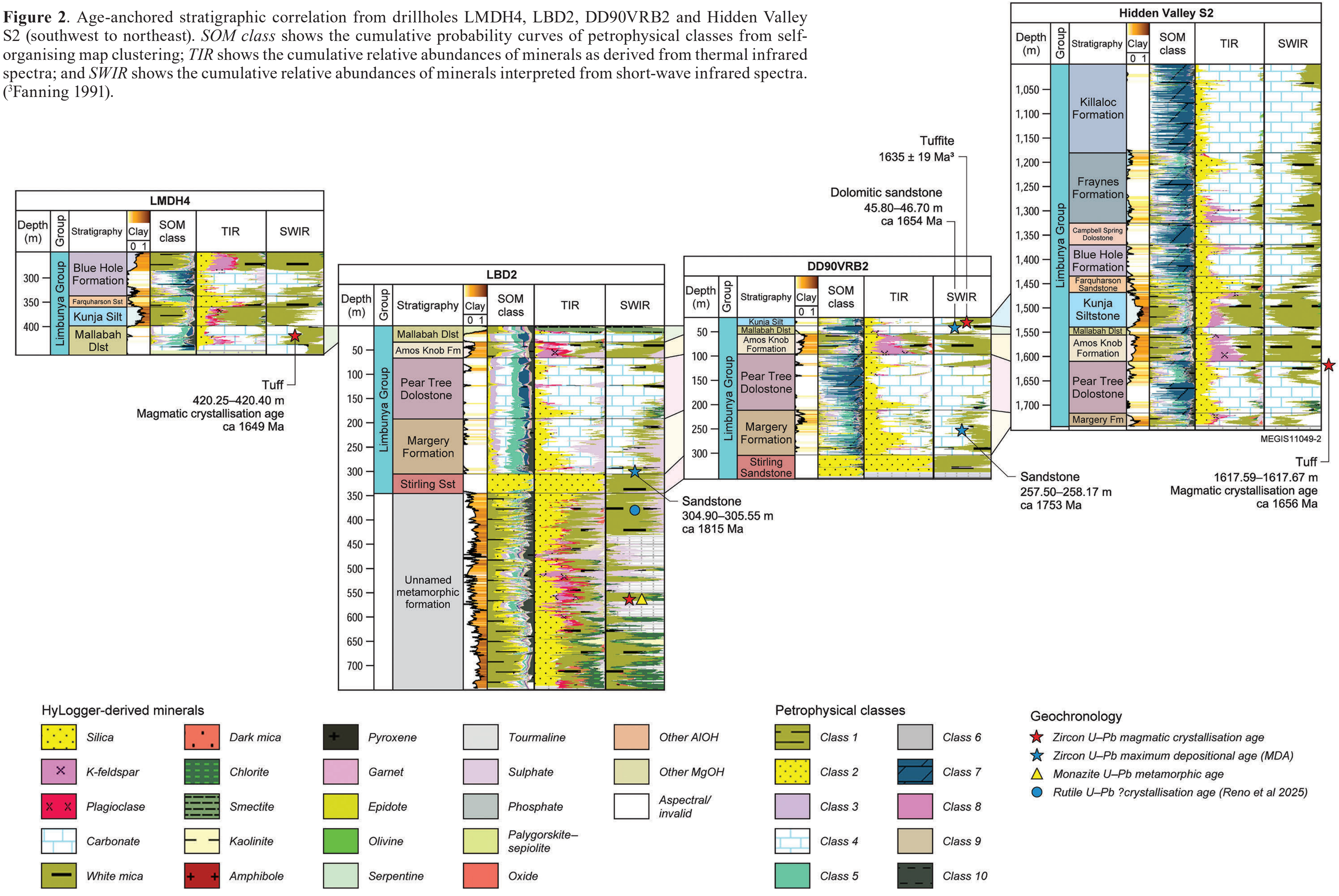
Updated thickness constraints and stratigraphic picks further sharpen basin-scale stratigraphic interpretation. The Farquharson Sandstone (Limbunya Group) is now consistently ~25 m thick across multiple wells along the north side of the Limbunya Fault and in Hidden Valley S2 (**Figure 1**) rather than previously reported thicknesses of up to several tens of metres, indicating a more condensed section. The Margery Formation (Limbunya Group) shows a more stable thickness range (~108 m) than earlier interpretations suggested, implying laterally consistent accommodation conditions. The Mallabah Dolostone has three internal intervals from mineral profiles and lithofacies, particularly in the drillholes along the north side of the Limbunya Fault (**Figure 4**); they are the upper and lower dolostone intervals and middle clastic-rich shale interval. Sulphides (galena, sphalerite and pyrite) occur commonly as disseminates in shales and veinlets in dolomites within the Mallabah Dolostone. Together, these adjustments to thickness constraints and stratigraphic picks refine the internal geometries of facies tracts across the basin.

The enhanced correlation framework also supports the recognition of basin-wide depositional systems. The Kunja Siltstone, Amos Knob Formation and Fraynes Formation show robust correlations of offshore claystone deposits across the basin (**Figures 2** and **4**). New maximum depositional ages from the lower Limbunya Group, ca 1717 Ma for the basal Stirling Sandstone (former ‘bunda grit’) and ca 1753 Ma and ca 1815 Ma from the sandstones of the Margery Formation, may indicate a regional depositional hiatus (eg Carson 2013), a condensed section within or above the Margery Formation or the dominance of older sedimentary sources in these two formations. However, a significant unconformity, that would normally be expected with a regional depositional hiatus, has not been identified within the lower Limbunya Group in drillholes or in outcrop (see Dunster and Ahmad 2013, Munson 2023). Sandy deposits at the bottom of the Pear Tree Dolostone in Hidden Valley S2 (**Figure 2**) demonstrate an onset of a second-order sequence (Schmid and Baumgartner 2024) after the deposition of the lower Limbunya Group. Abrupt facies shifts and changes in depositional style at the base of the Pear Tree Dolostone are consistent across the basin (**Figure 2**). Identifying these basin-wide depositional systems across multiple wells significantly improves the chronostratigraphic fidelity of the basin model.

Geochronology

New and compiled legacy U–Pb zircon datasets provide a substantially improved temporal framework for the Birrindudu Basin, enabling more confident alignment of stratigraphic packages with regional tectonic and metallogenic events. High-precision ages derived from tuffaceous horizons and detrital zircon populations across

Figure 2. Age-anchored stratigraphic correlation from drillholes LMDH4, LBD2, DD90VRB2 and Hidden Valley S2 (southwest to northeast). *SOM class* shows the cumulative probability curves of petrophysical classes from self-organising map clustering; *TIR* shows the cumulative relative abundances of minerals as derived from thermal infrared spectra; and *SWIR* shows the cumulative relative abundances of minerals interpreted from short-wave infrared spectra. ([3]Fanning 1991).



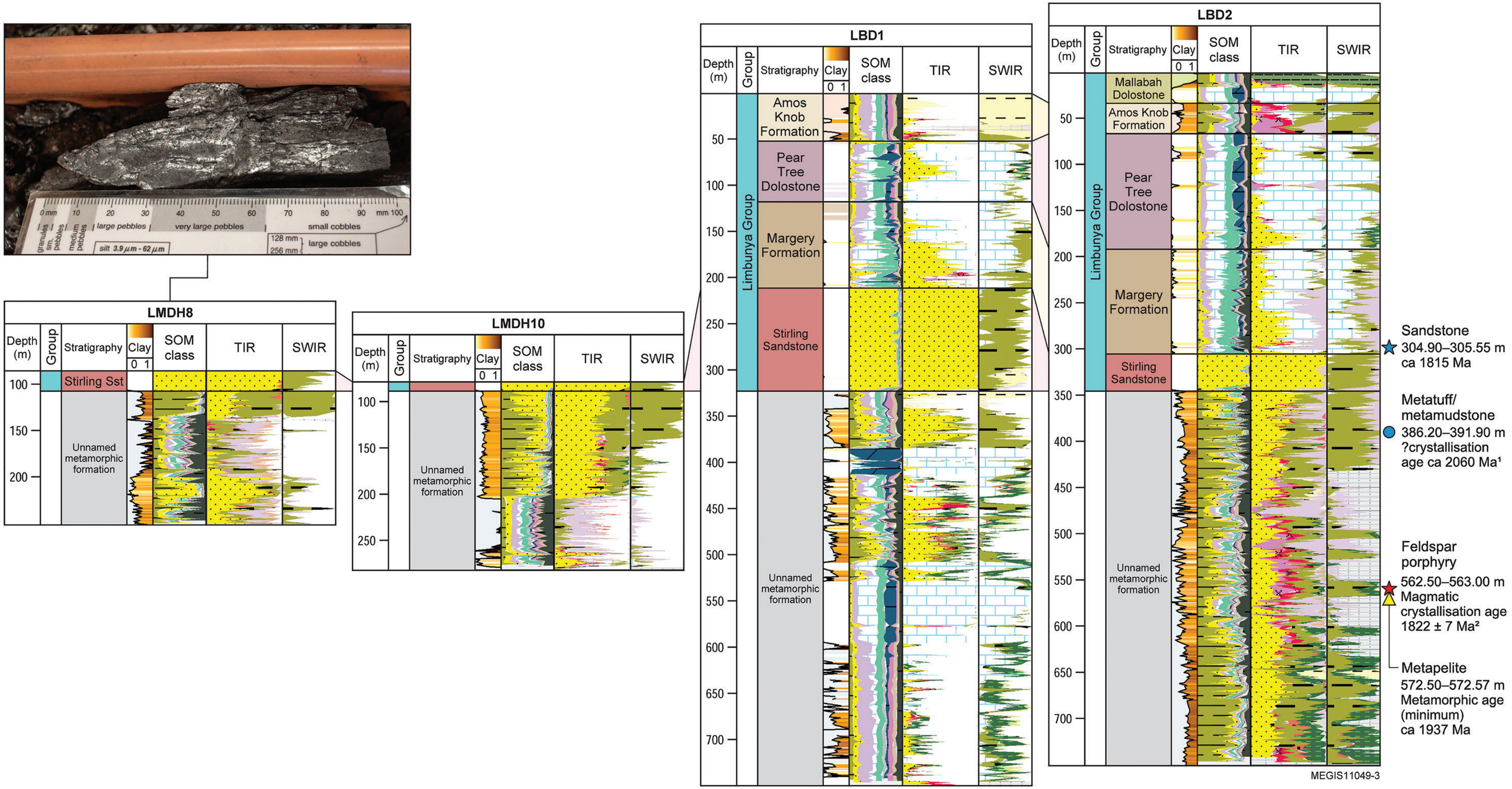


Figure 3. Stratigraphic correlation from drillholes LMDH8, LMDH10, LBD1 and LBD2 (west to east), also showing a hand specimen of graphitic metapelite from LMDH8 (145.2 mMD) and geochronology dates from LBD2 – [1]Reno *et al* (2025), [2]Kositcin and Carson (2024), with all other data being new results. Refer to **Figure 2** for legend and explanations of *SOM class*, *TIR* and *SWIR*.

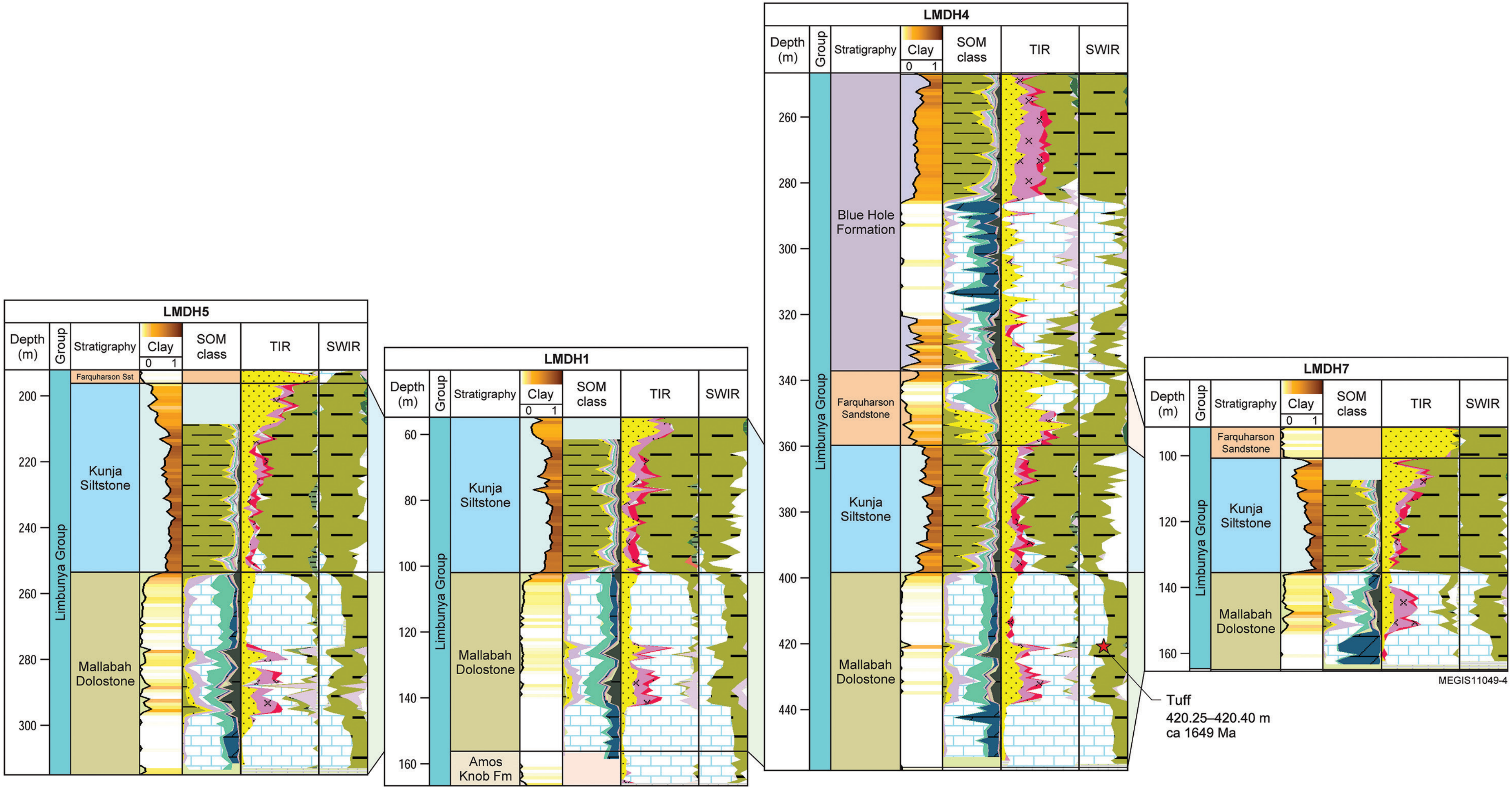


Figure 4. Stratigraphic correlation from drillholes LMDH5, LMDH1, LMDH4 and LMDH7 (west to east), located on the northern side of the Limbunya Fault. Refer to **Figure 2** for legend and explanations of *SOM class*, *TIR* and *SWIR*.

multiple wells constrain the chronostratigraphy of the middle to upper Limbunya Group. Significant results include the ages of ca 1649 Ma for the Mallabah Dolostone in LMDH4, ca 1656 Ma for the Pear Tree Dolostone in Hidden Valley S2, and 1635 ± 19 Ma for the Kunja Siltstone in DD90VRB2 (Fanning 1991) (**Figure 2**). These horizons consistently yield ages of ca 1660–1640 Ma (**Figures 2** and **4**), providing isochronous tie-points that significantly reduce uncertainty in correlating stratigraphic units across the basin. These ages confirm that major portions of the Limbunya Group were deposited contemporaneously with the Barney Creek Formation and other similarly aged systems in the McArthur Basin and with similarly aged stratigraphy in the Mount Isa Province. Establishing this temporal equivalence not only strengthens cross-basin correlations but also highlights the Birrindudu Basin's potential to host mineralising systems of similar scale and style.

Key refinements in understanding of the basin's temporal architecture are further supported by newly recognised volcanic units in the northern Birrindudu Basin. In TIPD2, a tuff bed dated at ca 1639 Ma provides a critical marker demonstrating that middle to upper Limbunya Group age volcanic activity extends into areas previously mapped as the older Tolmer Group. This northward extension of ca 1640 Ma units requires a revision of existing geological maps and stratigraphic boundaries (**Figure 1**) and suggests that the tectono-sedimentary regime responsible for middle to upper Limbunya deposition was more expansive than previously understood. Such reinterpretation has major implications for exploration, as it expands the extent of rocks capable of hosting metal-fertile stratigraphy into the northern Birrindudu Basin.

Insights into the basement architecture also emerge from new zircon and monazite geochronology. The geochronological age of 1822 ± 7 Ma measured from feldspar porphyry intrusion samples in LBD2 provided the minimum age of the lower metamorphic formation (Kositcin and Carson 2024). In LMDH11, a zircon U–Pb maximum depositional age of ca 1867 Ma for a quartz phyllonite is consistent with the metamorphosed basement in this drillhole being part of the Inverway Metamorphics. In contrast, a monazite U–Pb minimum metamorphic age of ca 1937 Ma for a metapelite in LBD2 constrains the age of the metamorphosed basement underlying the Limbunya succession in this drillhole to be significantly older than the Inverway Metamorphics (**Figure 3**). Although more work is needed to fully characterise the metamorphosed basement in this area, these new age data suggest the presence of different basement sequences underlying the Limbunya succession, potentially age-equivalent to the Tanami Region and Pine Creek Orogen. The presence of a Palaeoproterozoic basement beneath younger Palaeoproterozoic sequences highlights the long-lived and complex depositional history of the region and underscores the influence of basement heterogeneity on fluid flow and mineralisation processes.

Implications for resource potential

The integrated framework exposes multiple exploration-relevant outcomes. The improved correlations sharpen identifying play fairways and exploration targets in the Birrindudu Basin and underlying basement. The integration of clay-ratio and SOM-class curves into the correlations have enhanced stratigraphic accuracy by improving the definition of formation tops and stratigraphic character.

Sediment-hosted base metals: Recognition of middle to upper Limbunya age (ca 1640 Ma) volcanic and sedimentary packages – time-equivalent to host rocks for world-class Pb–Zn–Ag and Cu systems in adjacent provinces – expands the prospective footprint into the northern Birrindudu Basin, where such ages were not previously mapped (eg Tolmer Group; **Figure 1**). Anomalies of elements, such as Pb, Zn and Cu, and observation of galena, sphalerite and pyrite disseminates/veinlets suggest the potential for base metals in the Birrindudu Basin region. Stratigraphic continuity and refined thickness trends (eg Farquharson Sandstone, Kunja Siltstone, Mallabah Dolostone) help better target reductant-bearing facies, permeable conduit pathways, and basin-margin traps favourable for fluid focusing and metal precipitation.

Graphitic resource: Characterisation of a black metapelite interval in the underlying basement with elevated graphitic resource potential expands the prospective footprint for graphite into the Birrindudu Basin region. With TGCs of 4.9–12%, the black metapelite looks dark, metallic and lustrous in appearance in LMDH8 (**Figure 3**). This interval demonstrates that the basement underlying the Birrindudu Basin has the potential for graphitisation under appropriate thermal or metasomatic conditions. Based on basin evolution and rock types, graphite resources may be associated with metasediments proximal to intrusive, sheared or altered zones along deep-seated structures or conductive anomalies detectable through electromagnetic (EM) surveys. A coordinated geophysical and geochemical investigation (particularly EM + Raman spectroscopy + total organic carbon mapping) of new shallow drillholes could rapidly advance graphite targeting.

Exploration de-risking and targeting: Correlation-supported revisions to both drilling-company interpretations and CSIRO chronostratigraphic framework picks (Schmid and Baumgartner 2024) enhance stratigraphic accuracy by reducing mispicks and improving the delineation of high-value exploration targets. The tuff-based age model provides isochronous tie-lines for cross-sections and seismic integration, enabling more robust ranking of drill-ready targets. This refined basin framework also reveals structural and stratigraphic patterns that were previously obscured by miscorrelation, substantially expanding the prospective target space for future exploration drilling and resource assessment across the Birrindudu Basin.

Conclusion

Collectively, these results reposition the Birrindudu Basin region as genuinely prospective by demonstrating that its age-anchored stratigraphy hosts the right rocks at the right time, with Limbunya age windows overlapping regional metallogenic pulses and stratigraphic architectures conducive to fluid flow and mineralisation. Despite uneven and sporadic data distribution, the identification of the

Limbunya Group in the northern basin, along with tighter formation boundaries and improved unit equivalence across key wells, reduces uncertainty for explorers. The geochronological-age-anchored stratigraphic correlation is particularly powerful in regions like the Birrindudu Basin region, where Paleoproterozoic sedimentary rocks 'interfinger' with tuffs that preserve datable horizons capable of anchoring the chronostratigraphic framework. By integrating multi-well correlations with precise U–Pb geochronology, we resolve key mismatches in stratigraphic successions, extend middle to upper Limbunya equivalents into areas previously mapped as Tolmer Group, and delineate new corridors prospective for sediment-hosted base metals and graphite resources. These advances refine the basin model, revealing structural and stratigraphic patterns previously obscured by miscorrelation and significantly expanding the target space for future exploration efforts.

Keywords: Resourcing Australia's Prosperity initiative, Birrindudu Deep Dive project, Birrindudu Basin region, Limbunya Group, Tolmer Group, well correlation, U–Pb zircon, U–Pb monazite, detrital zircon, sediment-hosted base metals, graphite, exploration targeting.

Data and acknowledgements

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References

Anderson JR, Southby C, Jorgensen DC, Carson CJ, Henson PA, Costelloe RD, Grosjean E, Carr LK, Fomin T and Hossain M, 2024. Exploring for the Future – 2023 Northwest Northern Territory Seismic Survey (L214): Preliminary geological interpretation and drill core analytical program. *Geoscience Australia*, *Record* 2024/25. doi:10.26186/149227

Carson CJ, 2013. The Victoria and Birrindudu basins, Victoria River region, Northern Territory, Australia: a SHRIMP U–Pb detrital zircon and Sm–Nd study. *Australian Journal of Earth Sciences* 60(2), 175–196. doi:10.1080/08120099.2013.772920

Cowan S, Boreham C, Hall D, Chao J, Phiukhao W, Anderson J and Carson C, 2024. Fluid-inclusion petrography and microthermometry for WLMB001B, Birrindudu Basin. *Geoscience Australia*. doi:10.26186/149270

Crombez V, Schmid S and Feneslau K, 2023. Sedimentological and petrophysical characterisation of the Birrindudu Basin, Northern Territory. *Northern Territory Geological Survey*, *Record* 2023-008.

Dunster JN and Ahmad M, 2013. Chapter 17 – Birrindudu Basin: in Ahmad M and Munson TJ (compilers). 'Geology and mineral resources of the Northern Territory'. *Northern Territory Geological Survey*, *Special Publication* 5.

Dunster JN, Beier PR, Burgess JM and Cutovinos A, 2000. *Auvergne, Northern Territory (Second Edition). 1:250 000 geological map series explanatory notes, SE 52-15*, Northern Territory Geological Survey, Darwin.

Fanning CM, 1991. Ion-microprobe U–Pb zircon dating of a tuffaceous horizon within the Kunja Siltstone, Victoria River Basin, Northern Territory. Australian National University, Research School of Earth Sciences, for Pacific Oil and Gas Pty Ltd: in Dunster JN (compiler), 2002. *'SHRIMP dating of tuffaceous samples from the Victoria Basin, NT, and Bungle Bungle Dolomite, WA'*. *Northern Territory Geological Survey*, *Technical Note* 2002-005.

Foley EK, 2024. 3D data compilation of the Birrindudu Basin, Northern Territory. *Northern Territory Geological Survey*, *Digital Information Package* DIP 043. https://geoscience.nt.gov.au/gemis/ntgsjspui/handle/1/93042

Grosjean E, Weston L, Webster T, Denman JL, Wang L, Anderson JR and Jorgensen, D, in prep. Carbon speciation and Rock-Eval data from graphitic core samples of the Birrindudu Deep Dive region. *Geoscience Australia*, Canberra.

Henson P, Carr L, Anderson J, Southby C, Jorgensen D, Grosjean E, Wainman C, Bailey A, Wang L, Edwards D, Li M and Cook W, 2025. Resourcing Australia's Prosperity – Birrindudu Deep Dive project: in *Annual Geoscience Exploration Seminar (AGES) Proceedings, Alice Springs, Northern Territory, 8–9 April 2025*. Northern Territory Geological Survey, Darwin, 46–50.

Korsch RJ, 2024. Basin inventory: Birrindudu Basin. *Geoscience Australia*, *Record* 2023/55. doi:10.26186/148672

Kositcin N and Carson CJ, 2024. Exploring for the future – SHRIMP U–Pb geochronology of drillhole LBD2, Limbunya region, Northern Territory. *Geoscience Australia*, *Record* 2024/20. doi:10.26186/149474

Kositcin N, Munson TJ and Jarrett AJM, 2025. Summary of results. Joint NTGS–GA geochronology project: Birrindudu Basin. *Northern Territory Geological Survey*, *Record* 2025-004.

Madden RHC, Rowels M, Anderson JR, Jorgensen DC and Carr LK, 2026. Petrography of the Birrindudu Basin and surrounds. *Geoscience Australia, Record* 2026/14. doi:10.26186/150938

Munson TJ, 2014. Petroleum geology and potential of the onshore Northern Territory, 2014. *Northern Territory Geological Survey*, *Report* 22.

Munson TJ, 2023. Stratigraphic characterisation of the Glyde package, greater McArthur Basin, Northern

Territory. *Northern Territory Geological Survey*, *Record* 2023-009.

Reno BL, Belousov I and Morissette M, 2025. Summary of results. NTGS laser ablation ICP–MS zircon and rutile age constraints on the basement to the Limbunya Group in drillhole LBD2. *Northern Territory Geological Survey*, *Record* 2025-003.

Schmid S and Baumgartner R, 2024. Sedimentology and mineral potential of the Birrindudu Basin, Northern Territory. *Northern Territory Geological Survey*, *Record* 2024-004.

Wang L, Bailey AH, Grosjean E, Carson C, Carr LK, Butcher G, Boreham CJ, Dewhurst D, Esteban L, Southby C and Henson PA, 2023. Petrophysical interpretation and reservoir characterisation on Proterozoic shales in National Drilling Initiative Carrara 1, Northern Territory. *The APPEA Journal* 63(1), 230–246. doi:10.1071/AJ22049.