Alligator Energy

ASX Announcement

16 November 2023

Inaugural Exploration Program now defined – Big Lake Uranium Project, South Australia

Alligator Energy Limited **ASX: AGE** (**Alligator** or the **Company**) is pleased to advise that its inaugural ground-based work program for the Big Lake Uranium Project (Big Lake) in the Cooper Basin, South Australia has been defined and a cultural heritage clearance is now underway.

Highlights

- ***Alligator secured first-mover status for targeting a conceptual REDOX-controlled 'roll front' uranium mineralisation model in the Cooper Basin in December 2021.***
  - The geological setting and scale of the Cooper Basin is analogous in many respects with the giant Chu-Sarysu Basin / Uranium Province in Kazakhstan (*Jaireth et al, 2008*) which produces 40% of the world's uranium using in-situ recovery (ISR).
  - Alligator is targeting permeable sedimentary units equivalent to those that host the Beverley/Beverley North, Honeymoon and Four Mile uranium deposits to the south of our Project in the Frome Basin.
- ***Alligator has spent the last 12 months obtaining, reprocessing and interpreting publicly available 2D/3D seismic data. In combination with other datasets, including airborne EM, downhole logging and regional geology this basin-wide integration has demonstrated:***
  - The potential for mappable and coherent paleochannels and other permeable basin sedimentary units, which are regarded as the key to discovering a functional roll-front uranium mineral system at Big Lake.
  - Depths to, and thicknesses of key target stratigraphy that fall well within economic ranges.
- ***A Native Title Agreement for Mineral Exploration (NTME) was previously executed with the Yandruwandha Yawarrawarrka Traditional Landowners Aboriginal Corporation (YYTLOAC) covering both cultural heritage protection and employment commitments.***
  - Protocols, requirements and timelines for cultural heritage clearances have been clearly established.
  - Other obligations of both parties confirmed and documented.
  - Alligator to use best endeavours to offer Members of the YYTLOAC, employment and/or sub-contracting opportunities associated with the Company's exploration work programs.

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- ***Proposed drill site locations identified, cultural heritage clearances in progress and drilling contractor engagement for an inaugural drill program in Q1-Q2 2024 underway.***
  - A reconnaissance visit was undertaken in late June 2023 to gauge access, accommodation alternatives and logistical issues.
  - A pre-clearance site visit with the YYTLOAC was then undertaken in late July 2023 to appreciate Traditional Owner heritage concerns and finalise areas for drill hole siting.
  - A cultural heritage survey over the finalised drill hole locations is currently in progress with YYTLOAC representatives.
  - Subject to feedback from the cultural heritage survey, a stratigraphic drill program totalling up to 45 holes, averaging 140m in depth, will be scheduled for Q1-Q2 of 2024 (**Figure 1**).

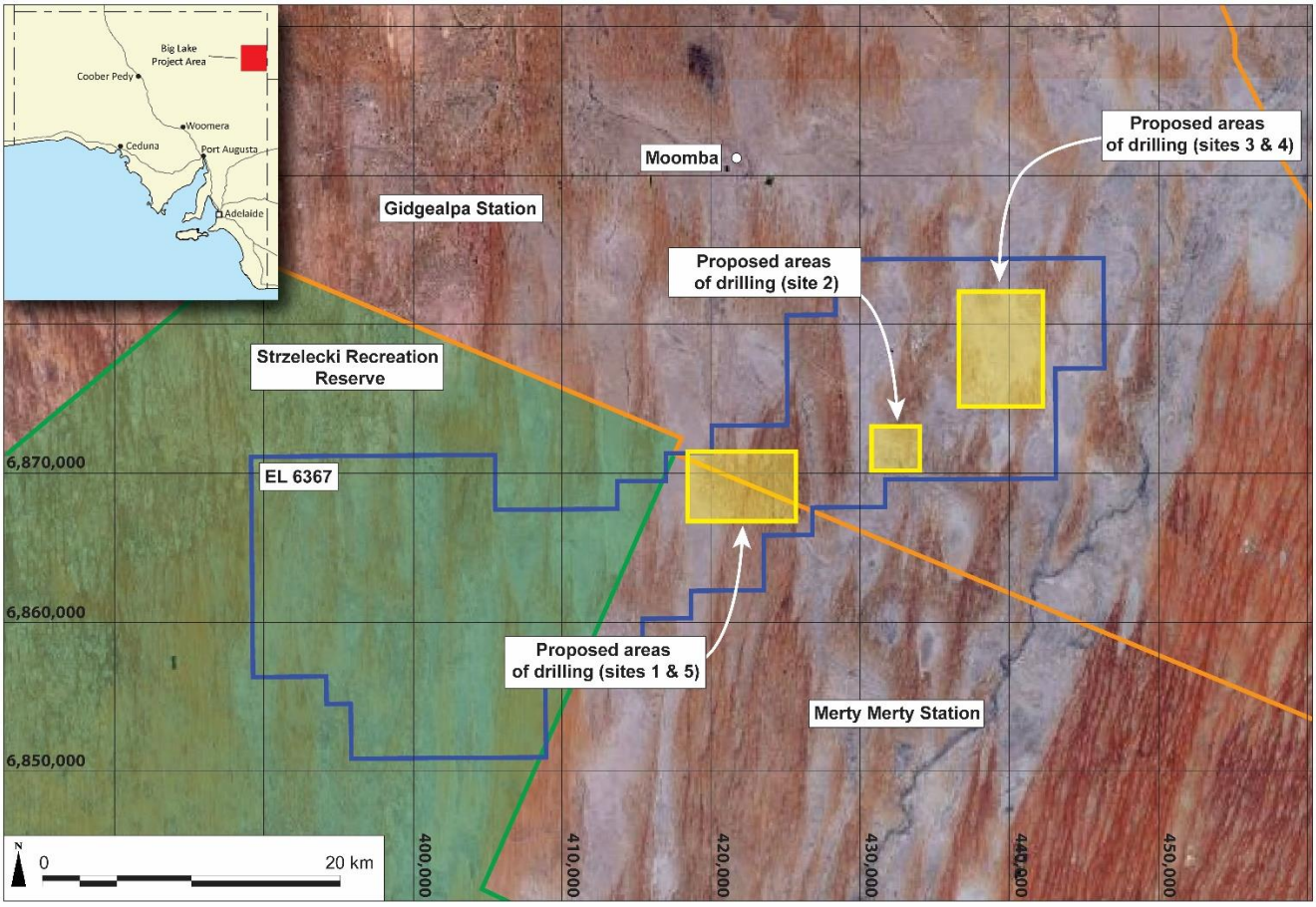

Figure 1: Proposed drill sites for 2024

Alligator's CEO Greg Hall stated: *"We have spent the last year methodically interpreting the seismic data that is publicly available from previous work done by the oil and gas companies operating in the Cooper Basin. This approach was viewed as a cost-effective method of identifying areas across our tenement package that display the right attributes for an exploratory drill program. We are now well placed to execute on our first on-ground work program.*

At the same time as undertaking the large technical desktop exercise, we took the opportunity to meet on multiple occasions with the Board of the Yandruwandha Yawarrawarrka Traditional Landowners Aboriginal Corporation to explain our exploration strategy and agree mutually acceptable terms for an NTMA".

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Project Background and Exploration Strategy

REDOX-controlled 'roll front' uranium mineralisation is being targeted by Alligator within the sedimentary Tertiary Namba and Eyre Formations and Cretaceous Winton Formation. The potential uranium source for the BLU Project is interpreted to be from weathering/leaching of the underlying uranium enriched Big Lake Granite Suite. The suite was recognised initially from regional heat flow maps of Australia and elevated geothermal gradients in the Cooper Basin petroleum wells. They were subsequently recognised in seismic data and later intersected in petroleum wells.

Uranium from this potential source is interpreted to migrate via oxidised groundwater into permeable units and paleochannels within the basin. Hydrocarbons generated in the lower part of the basin are known to have transgressed stratigraphy and leaked into the upper parts providing the reductant for uranium to precipitate from the groundwater (**Figure 2**). Numerous regional petroleum wells show traces of uranium throughout the sedimentary sequences of the basin, confirming the potential for the mineralisation model described above, with recently acquired airborne electromagnetics and reprocessed seismic data demonstrating continuity and volume potential.

To achieve exploration success at the Big Lake Project, namely the identification of uranium mineralisation, the Company is focussing its exploration targeting strategy around the following key criteria:

- Source rock – Big Lake Granite Suite and associated 'Granite Wash Plays'.
- Migration of uranium bearing fluids into shallower parts of the Cooper Basin stratigraphy.
- Presence of hydrocarbon reductants (Ch_4/H_2S) for redox reactions to occur, and
- Development, preservation and capping of permeable sedimentary sequences

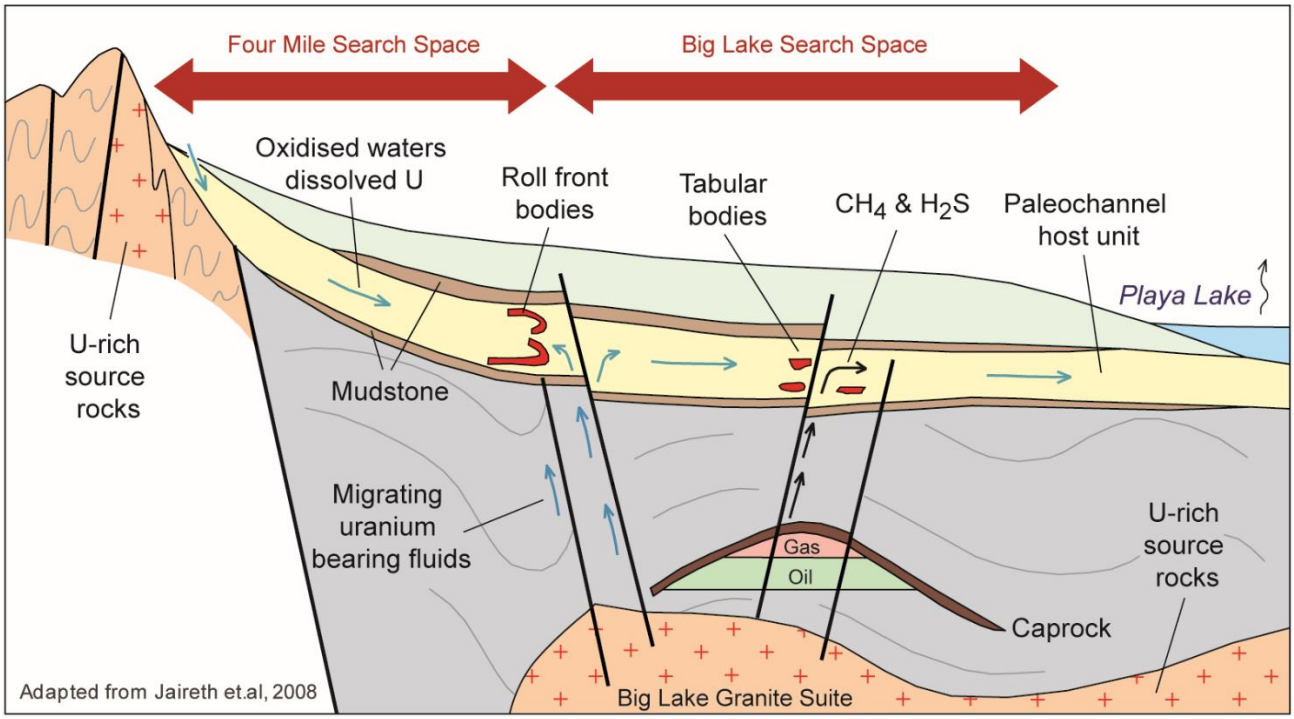

Figure 2: Basic conceptual model for the Big Lake Project.

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Big Lake 2023−24 Work Program

Subject to rig availability, AGE is working towards a drilling program of 30 to 45 holes up to 200 m deep in Q1−2 of 2024. The program will test the mineralisation model on a number of drill fences (lines of holes), provide greater insight into host stratigraphy and set the foundations for a more target-driven future drilling program.

3D Seismic Interpretation for Exploration Target Generation

Results of a recently completed solid-geology interpretation focused on isolating potential palaeochannels by mapping the base and thickness of the Namba, Eyre and Winton Formations. The interpretation utilised 2D/3D seismic datasets (including the recently released Cooper Basin 2D^{Cubed} seismic reprocessing data) in conjunction with petroleum well lithological logs to construct a geological consistent model across the eastern half of EL 6367. These results were then used to guide exploration target generation for the forthcoming drill program (**Figure 3**).

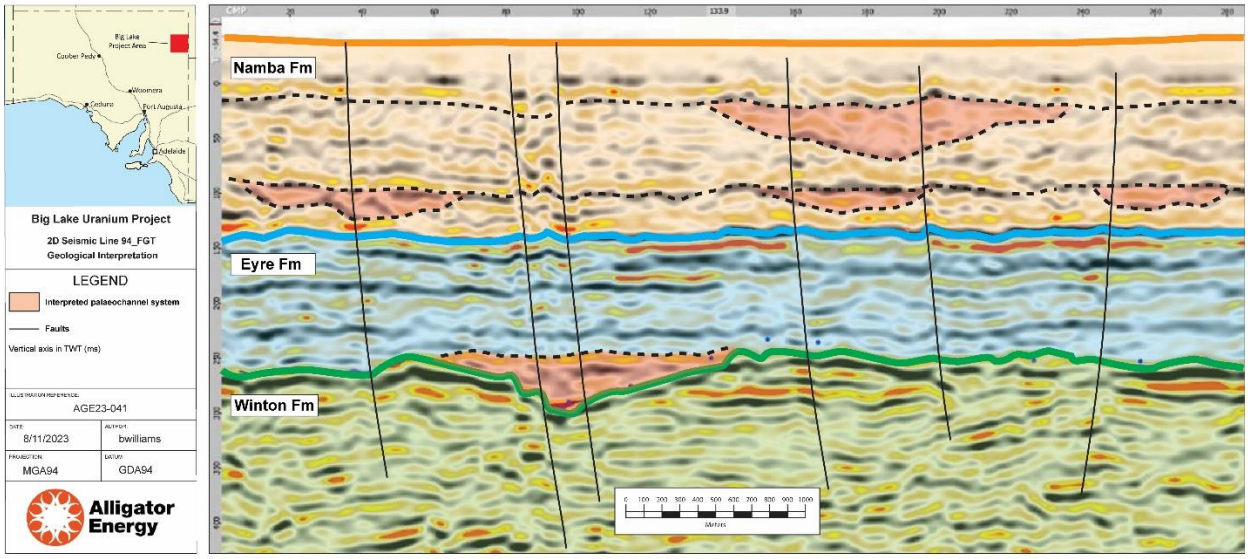

Figure 3: Geological interpretation of 2D seismic line data. Formation tops, erosional surfaces and cut-and-fill features are evident within various levels of the stratigraphy.

This released was authorised by Greg Hall, CEO and Managing Director.

Contacts

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JORC Code, 2012 Edition – Table 1

Section 1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	• Not applicable, no drilling or sampling conducted.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• Not applicable, no drilling conducted.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• Not applicable, no drilling conducted.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• Not applicable, no drilling conducted.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*	• Not applicable, no drilling or sampling conducted.

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Criteria	JORC Code explanation	Commentary
	• *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• Not applicable, no drilling or sampling conducted.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• Not applicable, no drilling or sampling conducted.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• Proposed locations for forthcoming drilling program surveyed in with handheld GPS with positioning accuracy of better than 10 m (depending on the constellation of satellites at the time). Locations referenced to MGA 54.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• Not applicable, no drilling conducted.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• Not applicable, no drilling conducted.
Sample security	• *The measures taken to ensure sample security.*	• Not applicable, no drilling conducted.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• No audits or reviews undertaken of sampling techniques to date.

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Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• Tenure EL6367 is owned by Big Lake Uranium Pty Ltd, a 100% owned subsidiary of Alligator Energy Ltd. It is part of eleven mineral tenements covering 10,802 square km over the Cooper Basin. • The tenement was granted on 22 July 2019 and has an area of 818 square km. • Tenement grant was subject to a Native Title Agreement for Mineral Exploration (NTME) with Traditional Owners; the Yandruwandha Yawarrawarrka Traditional Landowners Aboriginal Corporation. This was executed in 2022. • The company operates the tenement under a SARIG-approved program for environment protection and rehabilitation (PEPR), including a radiation management plan (RMP).
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Limited exploration by other parties for uranium and minerals within the northern cooper basin. However (extracts from the Final Report, 2013): • TC Development Corp P.L. held 29 tenements over the region for uranium exploration from March 2008 to 2013. The model employed was for "possible large Kazakh style sandstone-hosted and other sedimentary roll- front type uranium mineralisation styles". • TC's interest stemmed around previously "recognised gamma ray log anomalies that had been recorded in a number of existing oil and gas exploration and production wells in the Big Lake, Moomba, Daralingie and Moorari prospect areas, and to test and confirm the hypothetical sedimentary uranium mineralisation models". • "Historically reported logged radioactivity anomalies in petroleum wells were confirmed, and were characterised as sedimentary uranium occurrences, while target sand horizon environments potentially suitable for in situ leaching (ISL) extraction techniques were observed to be associated with the radioactivity anomalies". • TC's work in the vicinity has provided a comprehensive suite of drillhole (116 holes within EL6367) and downhole geophysical data that complements extensive oil-search seismic and airborne EM coverage over the district. • Limited other uranium or uranium-associated mineral exploration is known to

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Criteria	JORC Code explanation	Commentary
		have occurred within the tenure..
Geology	• *Deposit type, geological setting and style of mineralisation.*	• With uranium sourced from the Big Lake granite suite, a number of migration and trap-types are envisaged drawing upon the Kazakh-style sedimentary hosted mineralisation model. • Tertiary and Cretaceous aged formations are considered the most likely 'hosts.' This is based on historical logging, formation type, formation continuity and suitable ISR-amenable depths of up to ~ 200 m below surface. • As exploration is at a very early stage, the model and target are deemed provisional and subject to re-appraisal, following proposed drilling in 2024.
Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* ○ *easting and northing of the drill hole collar* ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* ○ *dip and azimuth of the hole* ○ *down hole length and interception depth* ○ *hole length.* • *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	• No drilling by AGE has occurred on the project.
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• No drilling by AGE has occurred on the project.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement*	• No drilling by AGE has occurred on the project.

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Criteria	JORC Code explanation	Commentary
	to this effect (eg 'down hole length, true width not known').	
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• Results are reported in appropriate diagrams and tables within this release.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• Not applicable.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	The drilling proposals in this announcement are based upon findings from historical and often publicly available datasets. This includes: • 2D seismic data reprocessed under the South Australian Energy & Mining Cooper Basin PSTM 2D^{Cubed} program of 2022. Under the program, 3855 lines of 2D seismic data acquired between 1985 and 2012 were reprocessed and made available to the public (see *https://www.energymining.sa.gov.au/industry/energy-resources/data-centre/seismic-data/recent-seismic-data-releases*) • Airborne electromagnetics (AEM) data acquired by AGE in 2021 over 3 blocks to a total of 1333 line km. The survey was flown by SkyTEM on north south lines 400 – 500 m apart. Integration with other datasets, including the seismic above, utilises the contractor-supplied data inversions. This process employs a laterally constrained quasi 2D model to generate sections of electrical resistivity against depth. • Drillhole data across the basin and tenure includes a database of over a thousand petroleum and water-wells with total depths up to 3000 m. TC Development Corporation P.L's uranium exploration program of 2008 provides a dataset of another 116 holes with complete lithology logs and gamma logging. Average hole depth was 145 m but covered the target horizons of the Namba and Eyre Formations (See *ENV11926, sarig.sa.go.au)*. • Above datasets complemented with Geoscience Australia and SA Mines and Energy regional gravity, magnetics and heat flow maps to outline basin margins, depo-centres and basement depths.

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Criteria	JORC Code explanation	Commentary
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	Program for 2024 includes: • A 45-hole stratigraphic drilling program planned for early 2024 with hole depths up to 200 m deep to reach Tertiary – Cretaceous t the target horizons.. Fences of holes have been strategically located to also test the paleo-channel model concept, as interpreted from seismic and other datasets. • Subject to the review of the above results, a more substantiative and more targeted drilling program later in the year or early 2025.

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Forward Looking Statement

This announcement contains projections and forward-looking information that involve various risks and uncertainties regarding future events. Such forward-looking information can include without limitation statements based on current expectations involving a number of risks and uncertainties and are not guarantees of future performance of the Company. These risks and uncertainties could cause actual results and the Company's plans and objectives to differ materially from

those expressed in the forward-looking information. Actual results and future events could differ materially from anticipated in such information. These and all subsequent written and oral forward-looking information are based on estimates and opinions of management on the dates they are made and expressly qualified in their entirety by this notice. The Company assumes no obligation to update forward-looking information should circumstances or management's estimates or opinions change.

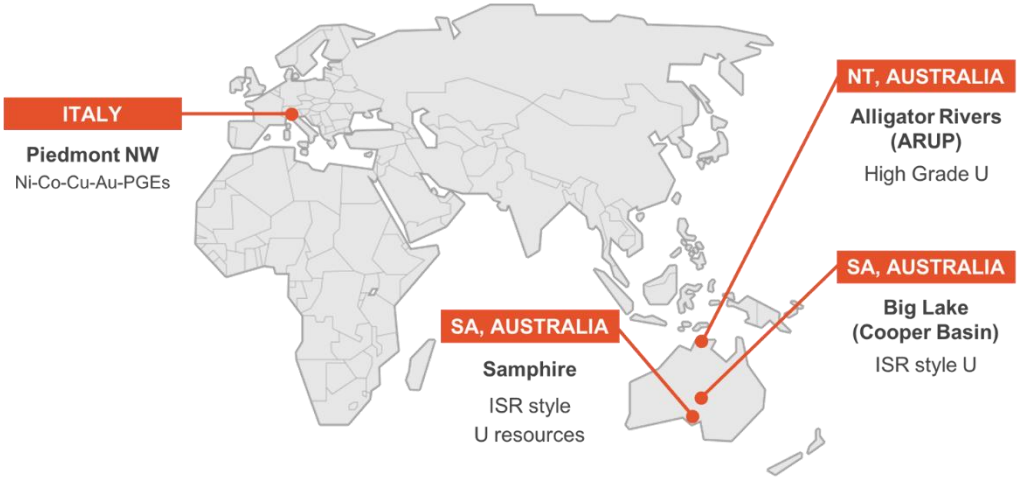
Competent Person's Statement

Information in this report is based on current and historic Exploration and Resource Drilling Results compiled by Dr Andrea Marsland-Smith who is a Member of the AusIMM. Dr Marsland-Smith is employed on a full-time basis with Alligator Energy as Chief Operating Officer, and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration (including 21 years in ISR uranium mining operations and technical work) and to the activity she is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Dr Marsland-Smith consents to the inclusion in this release of the matters based on her information in the form and context in which it appears.

About Alligator Energy

Alligator Energy Ltd is an Australian, ASX-listed, exploration company focused on uranium and energy related minerals, principally cobalt-nickel. Alligator's Directors have significant experience in the exploration, development and operations of both uranium and nickel projects (both laterites and sulphides).

Projects



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