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Cautionary Statement: SAMPHIRE SCOPING STUDY

The Scoping Study referred to in this ASX release has been undertaken for the purpose of initial evaluation of a potential 1 Mlb U_3O_8 per annum in-situ recovery ('ISR') mining operation (10Mlb U_3O_8 Production Target) of the Blackbush uranium deposit which forms part of the Samphire Project near Whyalla, South Australia. The study is a preliminary technical and economic assessment of the potential viability of the Project and builds on the desktop study conducted in the last quarter of 2020 (ASX release 16 December 2020). The Scoping Study outcomes, Production Target and forecast financial information referred to in this release are based on low accuracy level technical and economic assessments that are insufficient to support estimation of Ore Reserves. While each of the modifying factors was considered and applied, there is no certainty of eventual conversion to Ore Reserves or that the Production Target itself will be realised. Further exploration and evaluation work and appropriate studies are required before Alligator Energy will be in a position to estimate any Ore Reserves or to provide any assurance of an economic development case.

Of the JORC compliant Mineral Resource scheduled for ISR extraction in the Scoping Study production plan, approximately 75% is categorised as an Indicated Mineral Resource and 25% is Inferred. There is a low level of geological confidence associated with Inferred Mineral Resource and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the Production Target itself will be realised. The Inferred Mineral Resource (comprises 25% of the Production Target) has been modelled in the mine plan to cover the last ~3 years of the 12-year operation. Alligator Energy notes that the style of mineralisation and the experience to date in converting Inferred Mineral Resources to the Indicated category provides a reasonable basis for inclusion in these later years.

The Mineral Resources underpinning the Production Target in the Scoping Study have been prepared by a competent person in accordance with the requirements of the JORC Code (2012). The Competent Person's Statement is found on page 11 of this ASX release. For full details of the Mineral Resource Estimate, please refer to Alligator Energy's ASX release dated 2 March 2023, *Mineral Resource Upgrade at the Blackbush Deposit within Alligator's Samphire Project, South Australia*. Alligator Energy confirms that it is not aware of any new information or data that materially affects the information included in that release. All material assumptions and technical parameters underpinning the estimates in that ASX release continue to apply and have not materially changed.

This release contains a series of forward-looking statements. Generally, the words "expect," "potential", "intend," "estimate," "will" and similar expressions identify forward-looking statements. By their very nature forward-looking statements are subject to known and unknown risks and uncertainties that may cause our actual results, performance or achievements, to differ materially from those expressed or implied in any of our forward-looking statements, which are not guarantees of future performance. Statements in this release regarding Alligator Energy's business or proposed operations, which are not historical facts, are forward-looking statements that involve risks and uncertainties, such as Mineral Resource Estimates, market prices of metals, capital and operating costs, changes in project parameters as plans continue to be evaluated, continued availability of capital and financing and general economic, market or business conditions, and statements that describe Alligator Energy's future plans, objectives or goals, including words to the effect that Alligator Energy or Management expects a stated condition or result to occur. Forward-looking statements are necessarily based on estimates and assumptions that, while considered reasonable by Alligator Energy, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies. Since

forward-looking statements address future events and conditions, by their very nature, they involve inherent risks and uncertainties and are not guarantees of future performance. Actual results and future events could differ materially from that anticipated. These and all subsequent written and oral forward-looking statements are based on estimates and opinions of Alligator Energy on the dates they are made and expressly qualified in their entirety by this Statement. The Company assumes no obligation to update forward-looking information or statements should circumstances or estimates or opinions change. Investors are cautioned not to place undue reliance on forward-looking statements, which speak only as of the date they are made.

Alligator Energy has concluded that it has a reasonable basis for providing these forward-looking statements and the forecast financial information included in this ASX release. This includes a reasonable basis to expect that it will be able to fund the development of the Samphire Project upon successful delivery of key additional evaluation and regulatory milestones. The supporting reasons for these conclusions are outlined throughout this ASX release (including Section 13.0 of the Summary Report). While Alligator Energy considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the Scoping Study will be achieved.

To achieve the range of outcomes indicated in the Scoping Study, pre-production funding of approximately A$130m to A$150m will likely be required. There is no certainty that Alligator will be able to source that amount of funding when required. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of Alligator Energy's shares. It is also possible that Alligator Energy could pursue other value realisation strategies such as a sale, partial sale or joint venture of the Samphire Project. These could materially reduce Alligator Energy's proportionate ownership of the Samphire Project.

Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Scoping Study.

No Ore Reserve has been declared. This ASX release has been prepared in compliance with the current JORC Code (2012) and the ASX Listing Rules. All material assumptions, including sufficient progression of all JORC modifying factors, on which the production target and forecast financial information are based have been included in this ASX release.

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Alligator Energy

ASX Announcement

14 March 2023

Scoping Study confirms potential for a low cost ISR uranium operation at the Samphire Project

Alligator Energy Limited **ASX: AGE** (**Alligator** or the **Company**) is pleased to announce the results from a Scoping Study for the potential future development of the Blackbush Deposit, Samphire Uranium Project (**Samphire Project** or **Project**) south of Whyalla, South Australia.

Key Outcomes

- The Samphire Uranium Project Scoping Study confirms potential for development as a globally competitive low-cost uranium operation using the in-situ recovery (ISR) process.
- Life-of mine (LOM) Production Target of 10.0 Mlbs U_3O_8 over 12 years, **with annual production target of 1Mlbs pa** for 8 years with ramp up and ramp down.
- **Low initial capital expenditure forecast of A$129.3M (A$123M-A$136M)** including a significant combined contingency and cost escalation allowance of 40%.
- **Average cash operating costs of A$25.59/lb U_3O_8 (US$17.92 /lb U_3O_8)** with a range of A$24.31/lb - A$26.87/lb) and **AISC (including transport, shipping, royalties and sustaining capital) of A$43.19/lb U_3O_8 (US$30.23/lb U_3O_8)** with range of A$41.03/lb to A$45.35/lb.
- Attractive projected economics at a forecast US$65/lb U_3O_8 realised sales price and A$:US$ exchange rate of 70 cents:
  - **Ungeared, real pre-tax NPV_8 of A$185M (A$175M - A$194M)**
  - **Ungeared, real post-tax NPV_8 of A$152M (A$144M - A$160M)**
  - **Post-tax internal rate of return (IRR) of 29% (27.5% - 30.4%)**
  - **Payback period of 3.5 years from start of production**
  - **Forecast net project cashflow (post capex and tax) of A$305M (A$290M - A$321M)**
- Project economics greatly assisted by proximity to key infrastructure, a local workforce, low reagent consumption, a shallow uranium deposit and good permeability of the host sands.
- Low environmental footprint, focus on minimal disturbance and continuous rehabilitation, no long-term impact on saline groundwater, potential for low carbon intensity project.
- **Further upside/optimisation opportunities include**:
  - Future increase in Blackbush resource estimate, as some **major capital components are capable of 1.2Mlbs pa throughput**. This will provide a solid opportunity to study an increased Production Target with minimal additional capital.
  - Processing efficiencies aimed at reducing costs and increasing recovery rates.
  - Further exploration potential for additional uranium mineralisation, including the potential for the Plumbush prospect to be a satellite deposit to the proposed Blackbush plant.

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Next Steps and Additional information

- A pilot Field Recovery Trial (FRT) targeted for late 2023 will assist in further de-risking technical aspects of the Project. Planning and approval documentation for this is being finalised.

  (Note: this Scoping Study should not be confused with the current planning and approvals work for the pilot Field Recovery Trial (FRT) – the FRT is one step along the path to a potential full operation envisaged in this Scoping Study, along with other steps, e.g. a feasibility study, separate full mining approvals, and financing, etc).

- Through stakeholder engagement build an understanding of the very small footprint and low environmental impact that the pilot FRT will have, and the confirmatory technical and environmental information this will provide for the future operational design.

- Continued drilling to target resource extension and increased confidence, with continuous rehabilitation of drill sites.

- Additional studies planned to consider power and water supply and alternates, logistics and equipment supply sources, product transport route, and further environmental and amenity considerations, to then be followed post FRT by a proposed full feasibility assessment.

- Ongoing engagement with all stakeholders to obtain further understanding of their concerns, questions and issues of a future project; take account of these and develop mutual solutions.

- A realistic estimate of the continued work and time to advance the Project to possible construction and production is included below and in section 10. It is estimated that the earliest construction start would be in 2026, with initial commissioning production the following year.

- **A vision for the future - Investigate the opportunity for a near carbon-free energy project. The relatively low power consumption for the operation may allow full use of renewable power with battery backup, distance to Whyalla may allow a fleet of all electric vehicles and trucks, and recent advances in electric on-highway prime movers may support the low level of logistics and product transport needed.**

Alligator's CEO Greg Hall stated: *"We are very pleased to present the excellent results of the Samphire Project Scoping Study. This Study represents an initial estimate of a project based on the Blackbush deposit only within Samphire, producing 1 Mlbs pa U_3O_8 for supply into the increasing uranium demand supporting the low-carbon global nuclear power industry.*

The capital costs to establish an initial project are quite low, even with significant contingency and inflation assumptions, as the location adjacent to the City of Whyalla offers distinct advantages; a locally based workforce (no FIFO and camp); very experienced mining services and business support; and a lower cost of key infrastructure.

Operating costs are in line with similar ISR operations, despite the hypersaline quality of the groundwater within the deposit. The planned FRT will assist to verify these costs.

Alligator recognises this would be the first uranium project in this region, and there will be many questions and much interest from our stakeholders. We will continue to engage and work with stakeholders and ensure even at this early stage that the benefits such a project can bring are being realised. South Australia is an experienced and globally recognised uranium mining jurisdiction and Alligator is pleased to be working in this supportive framework."

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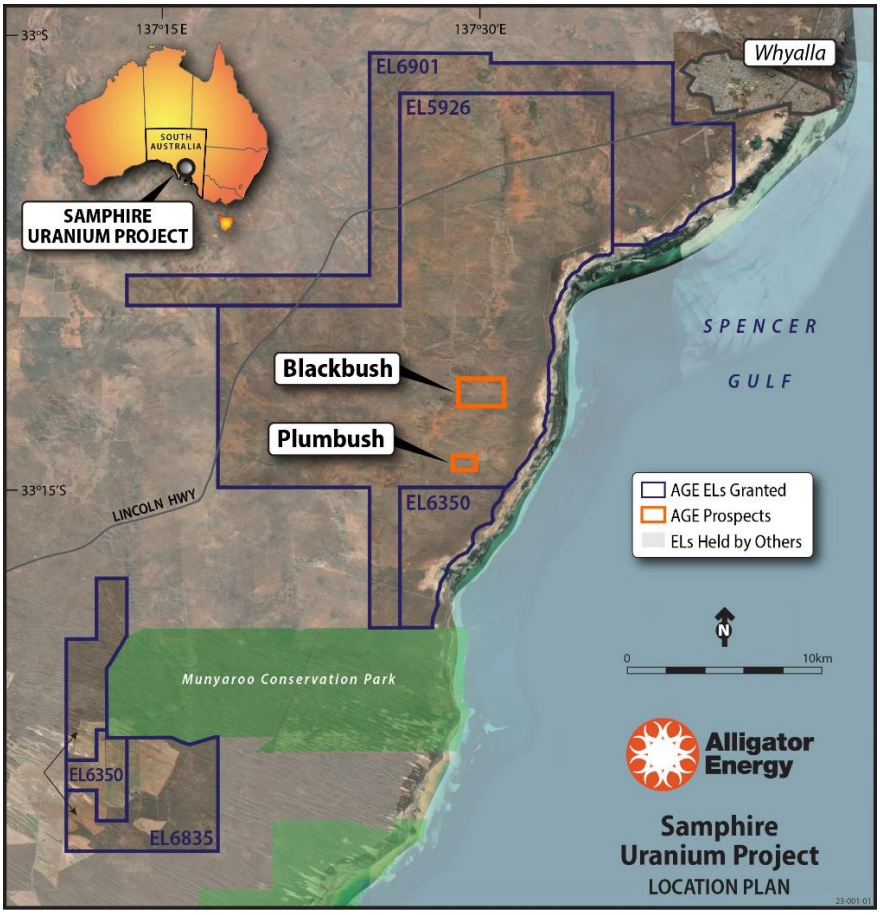
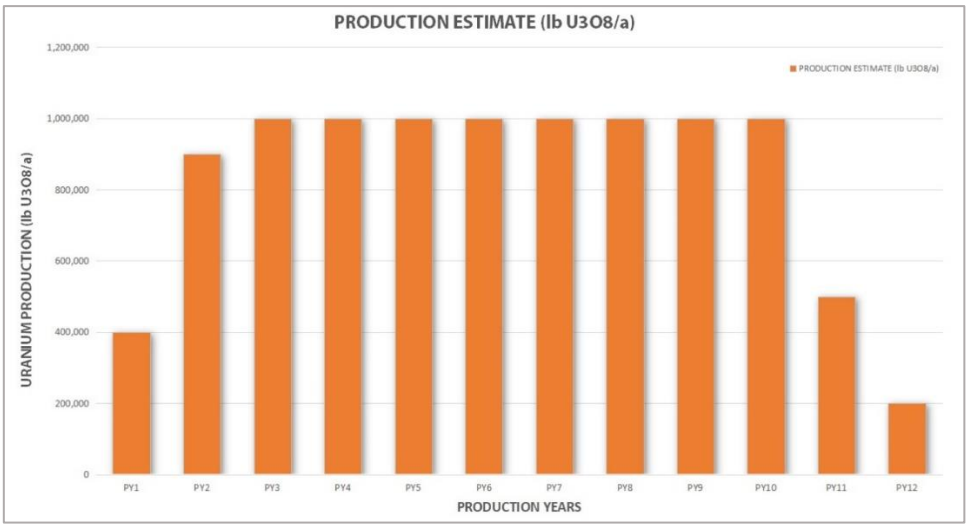
Executive Summary

The Samphire Uranium Project **('Samphire Project' or 'Project'**) is located 20km south of Whyalla in regional South Australia and was acquired by the Company in October 2020. Samphire comprised at that time two historical uranium prospects (Blackbush and Plumbush) on Exploration Licence 5926. Post acquisition Alligator acquired Exploration Licence 6350 and took out ELA's surrounding these licences which have now been granted. In acquiring Samphire, the Company recognised that South Australia was the most experienced State in terms of uranium operational, safety and regulatory experience, and uranium transport logistics. The State has been supportive in uranium exploration which identifies projects which can be brought forward for development, subject to an established approvals process.



Following acquisition of the Samphire Project a desk-top study was undertaken in December 2020 which indicated that the Project is highly amenable to In-Situ Recovery (ISR) production. Whilst initial Opex and Capex estimates were established these could not be disclosed to the market as the Blackbush resource category used for these studies was an Inferred Mineral Resource 100%. Since that time both sonic core and rotary mud drilling programs have been conducted at Blackbush and ANSTO was engaged to undertake bench-scale leaching and ion exchange testwork. Along with this, the Company has undertaken updated hydrogeological modelling, re-established groundwater monitoring of the hypersaline aquifer, developed rehabilitation techniques for historical drilling (which are now ongoing for new drilling), commenced weed control programs with pastoralists, and recommenced environmental monitoring and updating of surveys.

The results of the additional drilling were used to establish a new Mineral Resource Estimate (MRE) for the Blackbush deposit in October 2022, which was further updated in March 2023. The latest MRE totals 18.1Mlbs at a cut-off grade of 250ppm U_3O_8 from 11.4Mt @ 720ppm and includes a significant proportion (60%) in the Indicated category. This, along with the favourable bench-scale test results, have been incorporated into the Scoping Study based upon the in-situ recovery mining (ISR) method with a 10.0 Mlbs U_3O_8 total Production Target at the Blackbush deposit, and annual production targeting 1Mlbs pa U_3O_8 with a ramp up and ramp down as shown below.



The proposed Project at Blackbush based on ISR production will encompass:

- Establishment of wellfields
- Reverse osmosis (RO) plant to reduce the salinity of groundwater prior to ISR mining – required for improved Ion Exchange (IX) loading
- ISR of uranium from wellfields
- IX recovery of uranium from leaching solution using high-capacity salt tolerant resins
- Precipitation, calcining (drying) and packaging of Uranium Oxide Concentrate (UOC) into drums for transport from site and shipping from Port Adelaide.

The key highlights from the Scoping Study are:

- Simple, low impact mining technique which reduces both capital and operating costs, reduces environmental impact, and is easier to rehabilitate.
- Shallow depth of 60 to 80m to mineralised horizons, reducing well field drilling costs.
- Robust project economics with expansion potential from resource and exploration upside.
- Low initial capital cost estimate, despite inclusion of significant contingency and inflation.
- Globally competitive operating cost profile.
- Significant optimisation opportunities.
- Field Recovery Trial (FRT) for late 2023 to confirm parameters to be used in a full feasibility study.

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Samphire Scoping Study: Key Physical Parameters

Key Physical Parameters	Unit	Total/LOM
Operations		
Construction period	months	18
Annual production rate	lbs U_3O_8 pa	1,000,000
Initial production life	years	12
Processing		
Average grade of Mineral Resource	ppm U_3O_8	720
Estimated PLS grade from wellfield	ppm U_3O_8	100
Forecast overall uranium recovery	%	70
Output		
Total uranium production (Production Target)	Mlbs U_3O_8	10

A second option of taking the leaching / IX recovery operation through to a loaded resin at the Project, then transporting the essentially dry resin containing uranium by road and either selling or toll treating the resin at an external existing ISR operation was also considered and evaluated. This would eliminate the need for capital associated with the precipitation, calcining and packaging operations. However, the economics of this option were inferior to the main option evaluated, and no further analysis is provided in this release.

The Scoping Study process design and engineering was undertaken by Wallbridge Gilbert Aztec (WGA), and we thank their experienced teams for the excellent work undertaken.

WGA applied the AusIMM Scoping Study Class 5 requirements in which the range of estimation accuracy is +/- 50%. Alligator Energy believes that the bench scale processing testwork and sourcing of direct quotations for items such as reagents, production wells and some mechanical equipment items likely indicates a 30% to 50% range of accuracy. The key economic outcomes are summarised in the table below.

Samphire: Key Economic Outcomes

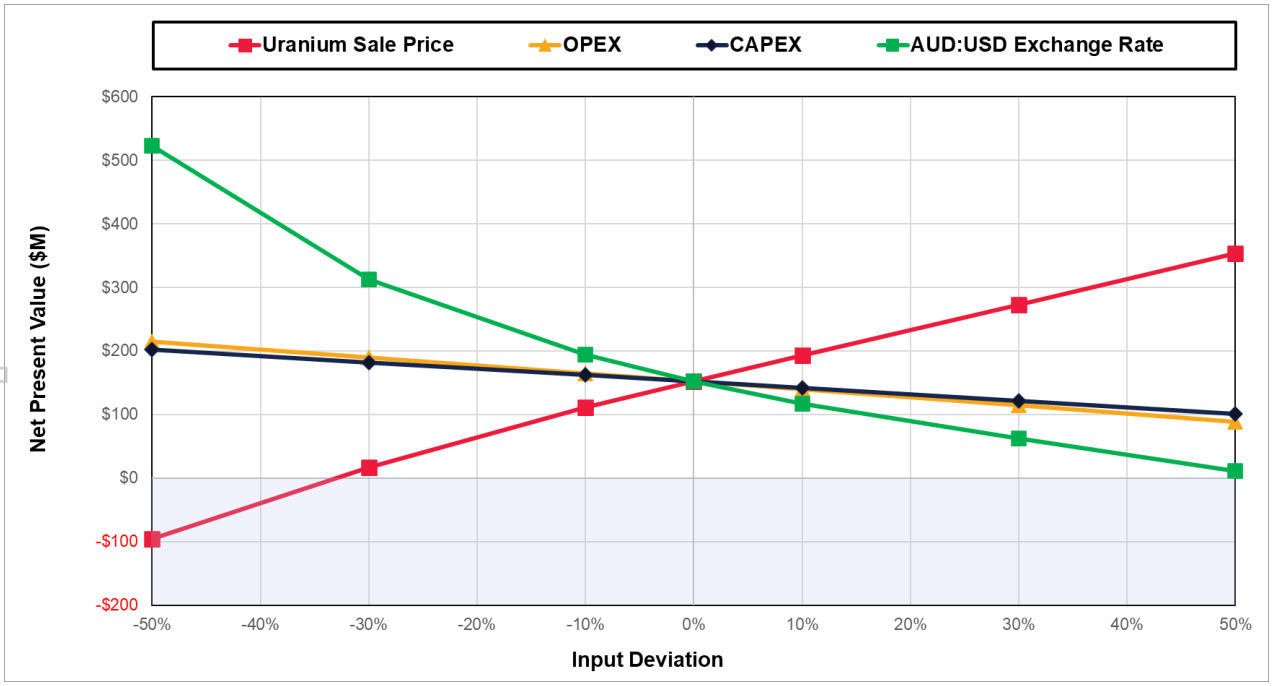
Metrics	Unit		Total
Price inputs			
LOM average uranium price	US$/lb U_3O_8		65
A$:US$ (revenue calculation only)	A$		70 cents
LOM average uranium price – A$	A$		92
Valuation, indicative returns and ratios		**Range**	**Mid-point**
NPV_8 (pre-tax, real, ungeared)	A$M	176 - 194	185
NPV_8 (post-tax, real, ungeared)	A$M	144 - 160	152
IRR (pre-tax, real, ungeared)	%	29.5 – 32.6	31
IRR (post-tax, real, ungeared)	%	27.6 – 30.5	29
Capex	**A$M**	**123 – 136**	**129.3**
Payback period (post-tax from first prod)	**Years**	**3.3- 3.7**	**3.5**
Cashflow summary			
Sales revenue (gross)	A$M	883 - 975	929.0
Processing Opex	A$M	(211- 233)	(222)
G&A Opex	A$M	(44 – 48)	(46)

Cash operating costs	**A$M**	**(255 - 281)**	**(268.0)**
Transport, shipping, marketing and royalties	A$M	(107 - 119)	(113)
Sustaining capital (incl. ongoing wellfield development) – net of residual	A$M	(49 - 55)	(52)
All in sustaining costs (AISC)	**A$M**	**(412 - 454)**	**(433)**
Pre-production capex	A$M	(123 - 135)	(129)
Tax Paid	A$M	(58 - 64)	(61)
Net Cashflow (post-tax)	**A$M**	**291 - 321**	**306**
Unit operating costs			
Cash Operating Costs (ex-royalties)	**A$/lb U_3O_8**	**24.3 - 26.9**	**25.6**
AISC	**A$/lb U_3O_8**	**41 – 45.4**	**43.2**
ASIC in US$	**US$/lb U_3O_8**	**28.7 – 31.7**	**30.2**

Samphire Project: NPV Sensitivity Analysis

A sensitivity analysis was undertaken on several key variables – UOC sales price, A$:US$ exchange rate, Opex and Capex. In assessing the sensitivity of the post-tax Project economics each of the parameters shown has been varied independently of the others. The sensitivity analysis highlights that for only one instance within the selected ranges would the NPV be less than zero.

An additional one-off sensitivity case was based on an estimate of increasing the maximum annual target production rate to 1.1 Mlbs pa U_3O_8, with a corresponding shortening of the production life to 11 years. This single point change would increase the post-tax NPV_8 to a range of A$153 M to A$169 M, or 6% increase in the post-tax NPV midpoint from A$152 M to A$161M.



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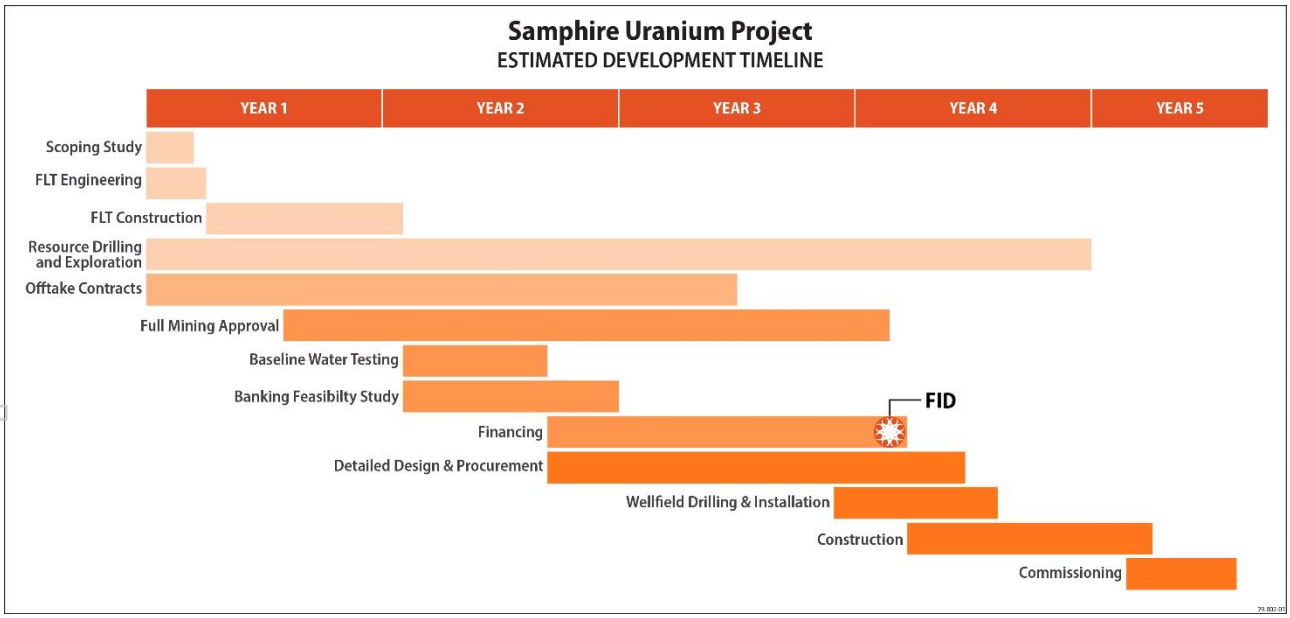
Development Schedule

A significant number of steps will be required to advance the Samphire Project through to first production, including:

- Ongoing drilling to bring the Blackbush resource to principally the Measured category, and continued resource extension,
- Successful completion of a pilot FRT trial,
- State and Federal Government approvals to obtain a Mining Lease, followed by approval of a Program for Environment Protection and Rehabilitation (PEPR) for the operation,
- Initial conditional offtake agreements,
- Completion of a Feasibility study to a standard that satisfies potential lenders,
- Detailed design and procurement,
- Financing – leading to FID,
- Construction and commissioning, and
- Ongoing production

The timing for securing all required Project approvals is estimated only, and based on similar ISR operation approvals in South Australia while recognising the extensive base line environmental work that has already been done at the Project, however also recognising that this will be the first uranium mine in this particular regional location.

A realistic estimate of the continued workstreams and time to advance the Project to possible construction and production is included below. It is estimated that the earliest construction start would be in 2026, with initial commissioning production the following year. For further detail on this refer to section 10 of the Summary Report.



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Next Steps

(Note: this Scoping Study should not be confused with the current planning and approvals work for the pilot Field Recovery Trial (FRT). The FRT is one step along the path to a potential full operation envisaged in this Scoping Study, along with other steps e.g., a feasibility study, separate full mining approvals, and financing, etc).

Alligator is finalising documentation to be submitted to the Department for Energy and Mining in South Australia (DEM) for approval of a Retention Lease (RL) and a pilot Field Recovery Trial (FRT) at the Project, targeted for late 2023. This FRT will greatly assist in further de-risking technical aspects of the Project. Planning, design work and detailed costing of the FRT is underway, with long lead items identified.

The Company has enhanced its level of stakeholder engagement around the FRT and wishes to build an understanding of the very small footprint and low environmental impact that this pilot process will have. The FRT will provide important confirmatory technical, environmental and hydrogeological information, both for a future potential operation design, and to support key stakeholder information. The FRT will be fully rehabilitated once all information is gathered, and if a future operation does not proceed.

Ongoing engagement is planned with all stakeholders to obtain further understanding of their concerns, questions and issues around both the FRT and a potential future Project; take account of these and develop mutual solutions and outcomes in going forward. An important part of this is also developing an understanding within stakeholders of the benefits the potential Project will bring to the region, including; additional diversified business opportunities; local direct employment and training (already occurring); Company support for local community; mutually beneficial engagement with pastoralists related to our focussed rehabilitation and weed management work (already occurring); development of new and innovative techniques for operating the Project.

Continued drilling (underway in late February 2023) to complete groundwater monitoring wells for the FRT, and to target further extension of the Blackbush resource. The drilling will also bring the immediate resource envelopes around the three-trial single well rings to a Measured category to allow accurate determination of actual recoveries during the trial.

All Samphire Project drilling sites are rehabilitated after data is gathered. Alligators environmental and progressive rehabilitation targets include: returning the land to approximately double the natural bush density that existed; managing and controlling existing weeds; planting of over 400 native tress so far as both screening and habitat; all in liaison with pastoralists.

Additional studies are to be undertaken ahead of a planned full feasibility assessment to consider power and water supply and alternates, logistics and equipment supply sources, product transport route plus management plan, and further environmental and amenity considerations.

A range of project optimisation opportunities will continue to be pursued, for example the potential for reducing the amount of pre-conditioning while ensuring adequate resin loading in the IX plant, and other alternates to this such as newly developed resins. The elution process (stripping of uranium from the IX resins) requires further testwork for optimisation of process and costs. In addition, ANSTO testwork indicated the possibility of low reagent consumption within the uranium leaching process where further cost-effective optimisation may be possible.

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Creating a vision for the future - Investigate the opportunity for a near carbon-free energy project, including:

- Lower power consumption (as ISR method has no rock or material movement, nor crushing and grinding of rock) may allow full use of renewable power with battery backup;
- Distance to Whyalla may allow all electric vehicles and light trucks to be used; and
- Recent advances in electric on-highway prime movers may support the low level of logistics and product transport needed.

Competent Persons Statement - Resource

The information for the metallurgy, leaching, ion exchange and the Mineral Resource included in this report is extracted from the reports entitled "*Highly Successful uranium leach and extraction tests for Samphire Uranium Project* created on 9 December 2022 and "*Mineral Resource Upgrade at the Blackbush Deposit, within Alligator's Samphire Project, South Australia*" created on 2 March 2023. These are available to view on the Alligator Energy Limited website. Alligator Energy Ltd confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. Alligator Energy Ltd confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcements.

March 2023 Blackbush Mineral Resource reported above a 250ppm U_3O_8 cut-off.

JORC Category	Mt	Grade (U_3O_8 ppm)	U_3O_8 Metal (KTonnes)	U_3O_8 Metal (Mlbs)
Indicated	6.1	796	4.8	10.7
Inferred	5.3	633	3.4	7.4
Total	**11.4**	**720**	**8.2**	**18.1**

The model is reported unconstrained and above a 250 ppm U_3O_8 lower cut-off grade for all zones in consideration of potential for recovery by in situ leach processes.
Estimation is by ordinary kriging for all mineralized zones.
Density is assigned as 2.05 t/m^3 based on limited test work.
The model assumes agglomeration of 12.5mE x 12.5mN x 2mRL panels for definition of well fields for production.
The model does not account for dilution, ore loss or recovery issues. These parameters should be considered during the mining study as being dependent on the treatment process.
Classification is according to JORC Code Mineral Resource categories.
Totals may vary due to rounded figures.

Competent Persons Statements

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.

The information in this announcement that relates to the Blackbush Mineral Resource estimate (uranium) is based on and fairly represents information compiled by and generated by Mr Ingvar Kirchner, a full-time employee of AMC Consultants. Mr Kirchner is a Fellow of the Australasian Institute of Mining and Metallurgy (the AusIMM) and a Member of the Australian Institute of Geoscientists (the AIG). Mr Kirchner has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which is being undertaken to qualify as a Competent Person as defined by the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code).

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This announcement has been authorised for release by the Alligator Energy Board.

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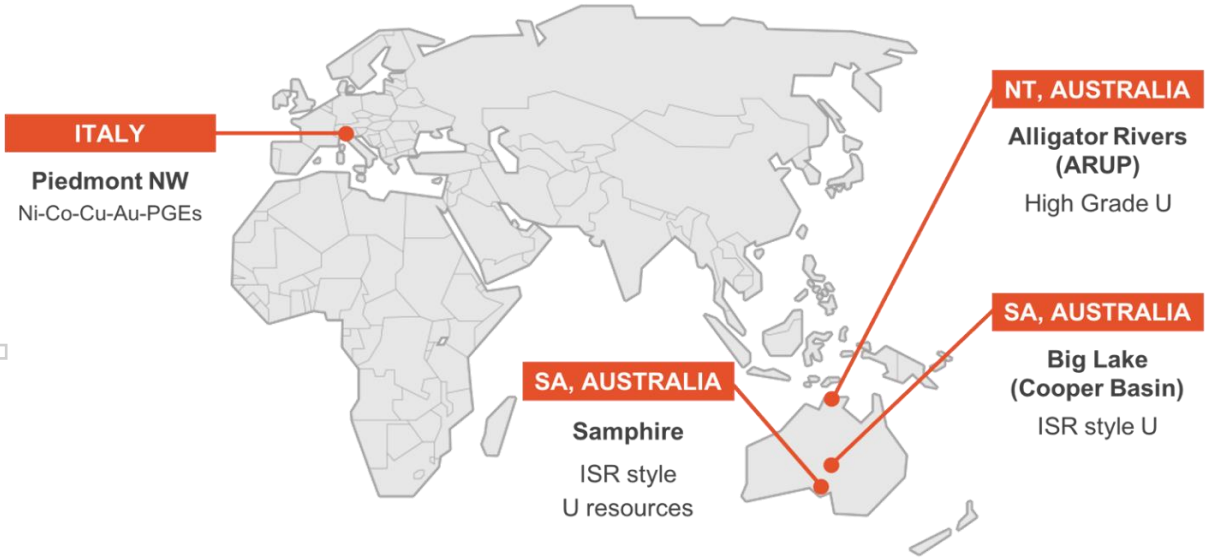
About Alligator Energy

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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Alligator Energy

Summary Report

Blackbush deposit In Situ Recovery Scoping Study (Samphire Uranium Project)

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APPENDIX A - ABBREVIATIONS

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1.0 Project Overview and Study Introduction

The Samphire Project was acquired by Alligator Energy (ASX: AGE) in October 2020 and is located on the eastern Eyre Peninsula, South Australia; 230km north-west of Adelaide and 20km south of the regional town of Whyalla (Figure 1). At the time of acquisition, the Project comprised of one uranium deposit (Blackbush) which contained an historical Inferred Mineral Resource[1] and a small uranium prospect (Plumbush[2]) approximately 5km south of Blackbush (Figure 1).

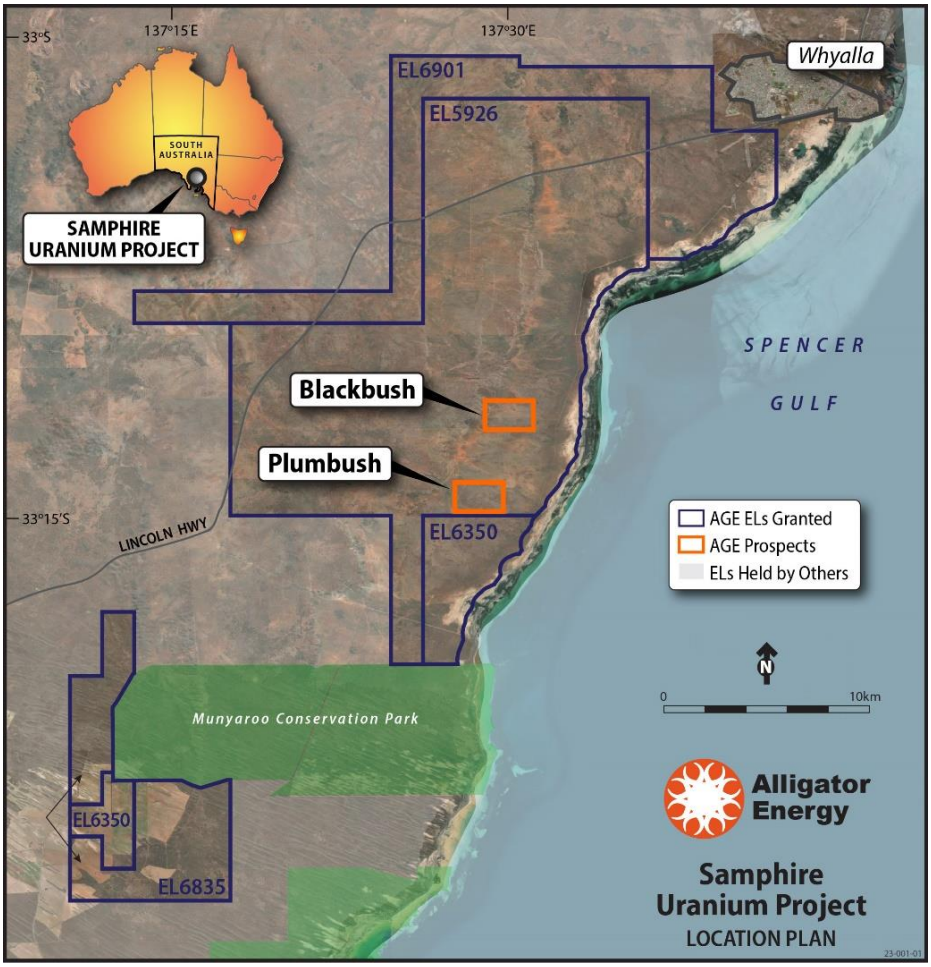

Figure 1: Project Location map

The company UraniumSA Ltd discovered Blackbush and Plumbush and further delineated the Blackbush deposit and carried out extensive baseline and technical studies in support of a Field Recovery Trial and associated draft Retention Lease (RL) Proposal in 2010-2011. Over 500 drill holes were drilled in the project area including 40 hydrogeological monitoring and pump test bores between 2007-2011 in support of developing the Blackbush deposit. The project stalled after 2012 due a depressed uranium price.

[1] *Refer* UraniumSA *ASX Release – 27 September 2013 "Samphire Uranium Project", https://www.asx.com.au/asxpdf/20130927/pdf/42jnqgsn2cqcgg.pdf*

[2] *Refer UraniumSA ASX Release – 8 April 2011 "Maiden Resource Estimate", https://www.asx.com.au/asxpdf/20110408/pdf/41xy4brvxj3d3c.pdf*

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Since 2020, Alligator has recommenced exploration and development activities, technical and resource evaluation studies to support an AusIMM Class 5 Scoping Study (+/- 50%) examining the economics of an In-Situ Recovery (ISR) operation. Wallbridge Gilbert Aztec (WGA) were engaged to develop a comprehensive process design criterion (PDC) to constrain the key assumptions, inform the plant design and related infrastructure, capital and operational cost estimates.

Alligator Energy believes that the bench scale processing testwork and sourcing of direct quotations for items such as reagents, production wells and some mechanical equipment items likely indicates a slightly better 30% to 50% range of accuracy.

2.0 Geological Setting and Mineral Resource Estimate

2.1 Tenement Status

The Blackbush deposit is located on Exploration Lease (EL) 5926. The tenement is 100% owned by a subsidiary of Alligator Energy Ltd (S Uranium Pty Ltd). Alligator Energy is the operator of the tenement. The EL overlies a perpetual crown lease (Moonabie Pastoral Lease) over which Native Title is extinguished (Figure 2). Alligator Energy has an existing access agreement with the pastoral lease owner, which provides access and compensation for exploration, and provides the right for access to land for a future mining lease, subject to negotiation. An NTMA Agreement for Exploration exists between S Uranium Pty Ltd and the Barngarla Determination Aboriginal Corporation (BDAC) under which Alligator executes its work programs.

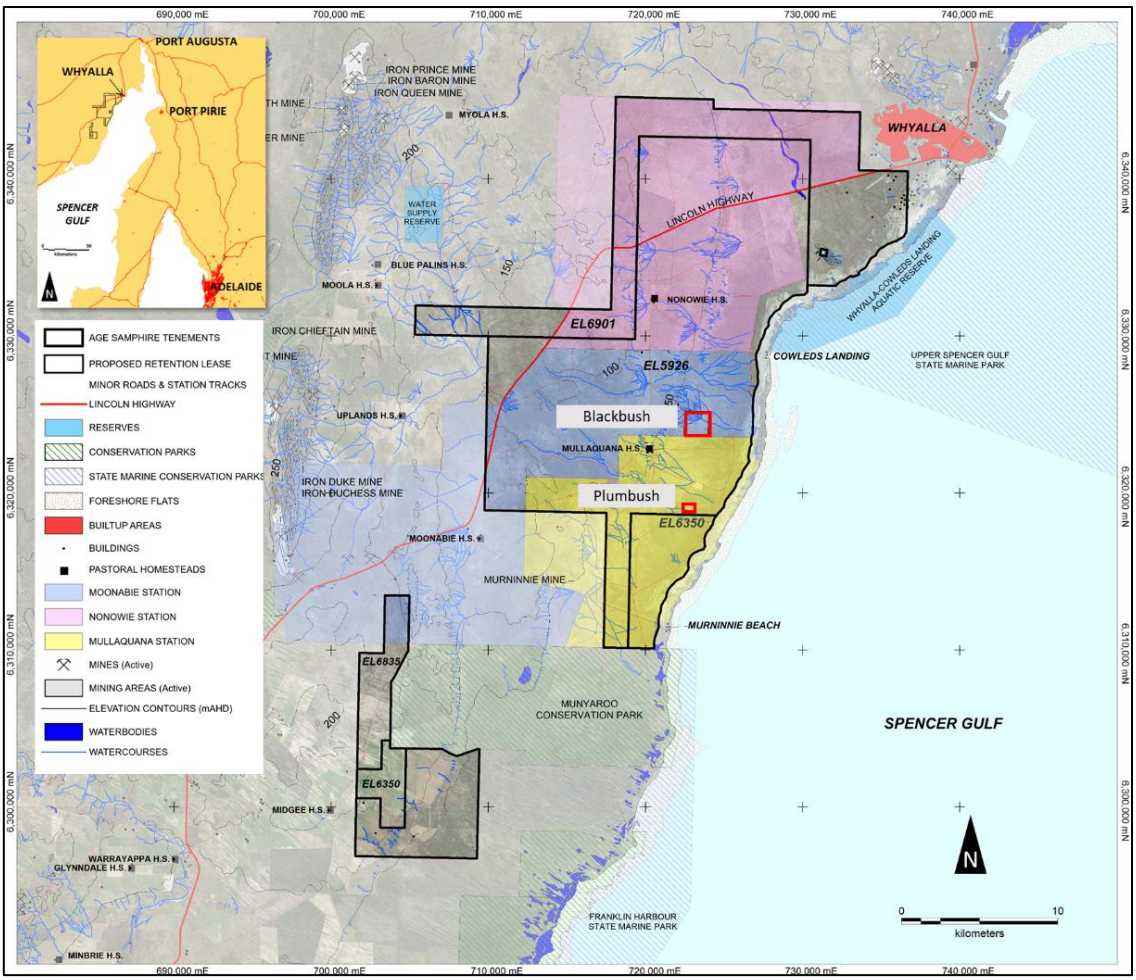

Figure 2. S Uranium Pty Ltd Exploration Leases and perpetual crown (pastoral) leases

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2.2 Geological/Hydrogeological Setting

Geology

Over 520 drill holes (totalling 4200m) have been drilled into the Blackbush deposit area including 40 hydrogeological monitoring and pump test bores from 2007 to 2022. Alligator Energy has since built on this dataset drilling a further 14 core and 84 rotary-mud drillholes to verify the historical data and determine the ISR mineral resource. The uranium mineralisation at Blackbush occurs in horizontal tabular lenses (50-90 m depth) in sand-dominated basal sediments of the Eocene Kanaka Beds within a Tertiary palaeochannel system.

The palaeochannel is incised into the Proterozoic Hiltaba granite (Samphire Granite) which has a variably weathered saprolite surface at its contact with the Kanaka Beds. The Kanaka Beds comprise cyclic fluvial quartz dominated sands and gravels intercalated with silts and clays with fine grained carbonaceous material towards the top of the sequence. The Kanaka Beds are overlain by the laterally continuous Miocene Melton Limestone (marl and limestone), the clay dominated Pliocene Gibbon Beds and a cover of Quaternary sediments (Figure 3).

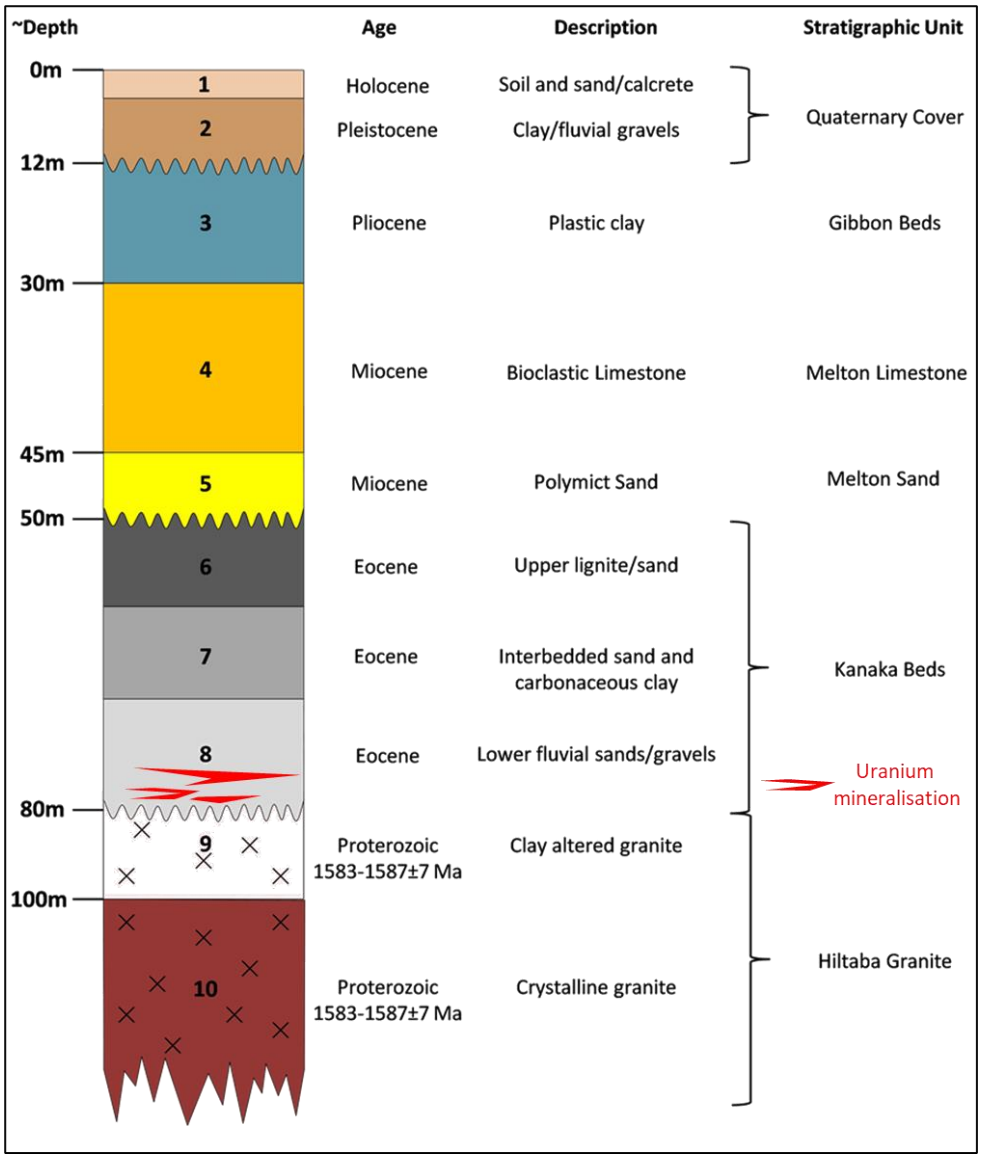

Figure 3. Simplified local geology stratigraphic section.

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The mineralisation at Blackbush is roll-front style uranium mineralisation occurring in up to 3 sub-horizontal zones which are constrained within the upper, middle, and lower lithologies of the Kanaka Beds. The common uranium minerals at Blackbush are uraninite and coffinite, common for this class of uranium deposit. The cumulative strike length of the deposit is approximately 2.7 km. Width of mineralisation across strike averages ~300 m, with widths of up to 450 m in some areas.

Hydrogeology

The Blackbush deposit is planned to be mined using the ISR method and satisfies the hydrogeological conditions for such an operation to be considered i.e., the mineralisation occurs within a confined aquifer contained within compacted but porous and permeable sand units (Tertiary Kanaka Beds).

A significant body of work has been undertaken to develop a detailed understanding of the hydrogeological setting of the Blackbush deposit. This work has included:

- Stratigraphic interpretation of over 500 exploration holes.
- Measurement of chemical and water level data of 28 monitoring wells over many years previously installed by UraniumSA Ltd.
- Extensive aquifer data (via pump test) by Australian Groundwater Technologies (AGT) in 2011 of up to 5 days duration at 6 locations within the Blackbush area.
- An assessment by AGT in 2011 and a review by Alligator Energy of the regional hydrogeological structure including the continuity of aquifers and confining strata.
- Additional baseline groundwater monitoring conducted in 2022 by Alligator Energy.

The Tertiary aquifer is confined above by two regionally extensive confining layers namely 16-20m of clay and marl (Melton Limestone) and 18 to 22m of plastic clays (Gibbon Beds). Underlying the Tertiary aquifer is 50 - 70 m of weathered granite sediments (clay) which separates the Tertiary aquifer from a Fractured Rock Aquifer (FRA) at depth. Aquifer testing shows no hydraulic connection between the Tertiary aquifer and the upper strata and no hydrogeological connection between the FRA and the Tertiary aquifer due to the effective clay confining layer.

Groundwater associated with the mineralisation is highly saline (35,000-60,000 TDS), more than that of seawater (~40,000 TDS) and contains radium (Ra^{226}) between 1.8-357 Bq/L categorising it as suitable for industrial use only. Alligator Energy's bench-scale testwork shows that while the uranium will leach readily within the hypersaline aquifer, the resin ion exchange (IX) will not perform as effectively at such elevated salinities (chloride levels). Hence reduction of groundwater chlorides prior to adding reagents for uranium leaching would improve IX effectiveness, thus preconditioning of the groundwater via reverse osmosis is planned prior to ISR mining. A field Recovery Trial (FRT) is planned for late 2023 to test this approach.

2.3 Mineral Resource Estimate

In August 2022, AGE released an initial ISR Mineral Resource Estimate for the Blackbush deposit of 14.8 Mlbs (combined Inferred and Indicated) for a cut-off grade of 250ppm U_3O_8. In March 2023,

this was increased to 18.1 Mlbs U_3O_8 following additional drilling undertaken in Q4 2022. The same cut-off grade was applied resulting in a 78% category transfer and increase in the Indicated Mineral Resource. The Blackbush MRE (Table 1) was prepared and reported in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code) by AMC Consultants (Perth) and reports only that portion which is amenable to ISR within the Kanaka Beds.

Table 1. Blackbush Mineral Resource Estimate (March 2023) reported above a 250ppm U_3O_8 cut-off.

JORC Category	Mt	Grade (U_3O_8 ppm)	U_3O_8 Metal (KTonnes)	U_3O_8 Metal (Mlbs)
Indicated	6.1	796	4.8	10.7
Inferred	5.3	633	3.4	7.4
Total	**11.4**	**720**	**8.2**	**18.1**

The model is reported unconstrained and above a 250 ppm U_3O_8 lower cut-off grade for all zones in consideration of potential for recovery by in situ leach processes.
Estimation is by ordinary kriging for all mineralised zones.
Density is assigned as 2.05 t/m^3 based on limited test work.
The model assumes agglomeration of 12.5mE x 12.5mN x 2mRL panels for definition of well fields for production.
The model does not account for dilution, ore loss or recovery issues. These parameters should be considered during the mining study as being dependent on the treatment process.
Classification is according to JORC Code Mineral Resource categories.
Totals may vary due to rounded figures.

3.0 Mining Method & Schedule

The Life-of mine (LOM) Production Target is 10.0 Mlbs U_3O_8 with annual production target of 1Mlbs pa U_3O_8 for eight years with ramp up and ramp down (Figure 4).

A total of 33 extraction wells are required to achieve the desired production rate. For the purposes of the Study, and to allow for well maintenance and downtime, it is assumed that 8 wellhouses are required. Each wellhouse will have capacity for 6 extractors (48 total) and up to 10 injectors (80 total). The ore-body morphology at current understanding suits a 5-spot ring pattern requiring 63 injectors total. The first 9 years of production will come from the 10.7 Mlbs of Indicated Mineral Resource and the remainder 3 years production from the Inferred Mineral Resource using the assumed 70% recovery factors, as shown in the proposed mine schedule and plan (Figure 4 & Figure 5) below.

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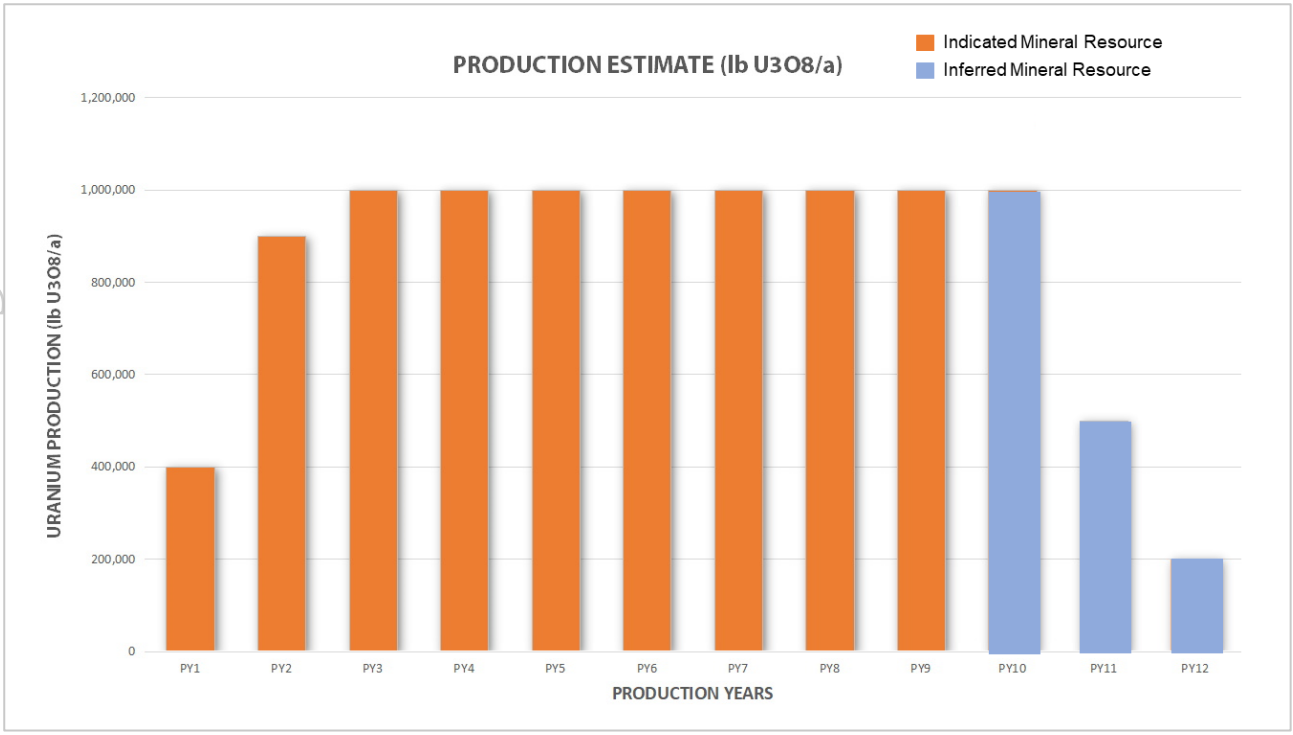

Figure 4. Life of mine production profile by resource classification

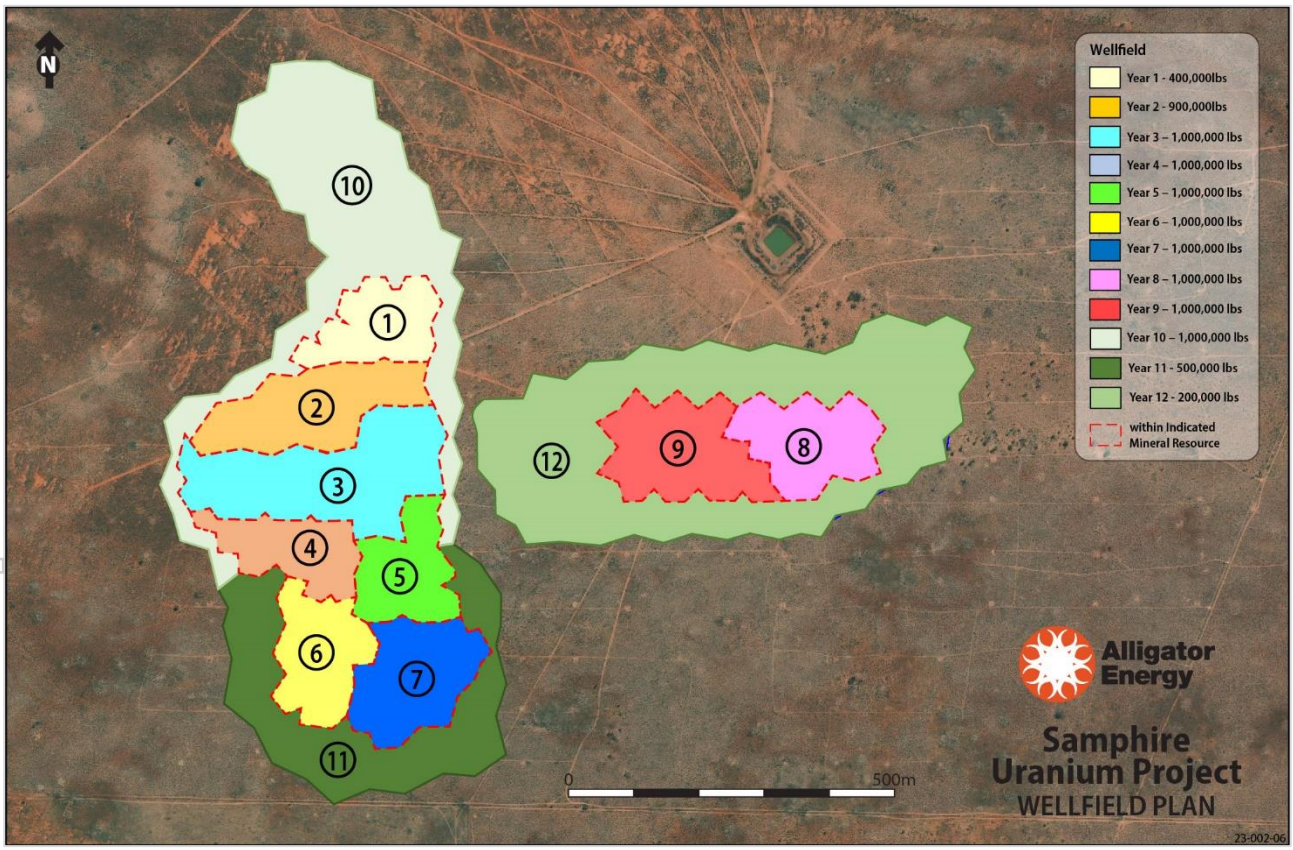

Figure 5. Blackbush wellfield mine plan

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4.0 Processing

4.1 Metallurgical Testwork

Metallurgical testwork on mineralised core material from Blackbush has been undertaken by Australian Nuclear Science and Technology Organisation (ANSTO) for the purposes of flowsheet development. Testwork included mineralogical analysis, leach tests and ion exchange (IX) resin loading studies using a Strong Base Anion (SBA) salt tolerant resin[3]. The testwork results highlighted the following and were incorporated into the PDC (Table 2).

1) Uranium is present primarily as coffinite, with minor amounts of uraninite and uranophane. The only other minerals present in significant quantities were quartz, comprising 96.3% and pyrite (1.1%)
2) The highly saline groundwater at Samphire does not impact uranium leaching into solution, with diagnostic leach results of ≥ 98.6% extraction in all tests, showing a high level of leachable uranium present.
3) The leaching performance of the uranium ore in an ISR scenario simulation over 33 days, using Samphire ground water from the mineralised zone adjusted to a pH of 1.5 showed high uranium extraction into solution between 92.9% and 96.3%.
4) Acid consumption was very low and a relatively low iron addition was required initially for effective uranium leaching
5) IX testwork showed loading efficiency of uranium is negatively impacted by higher groundwater salinity. AGE is proposing that wellfield ground water pre-conditioning be utilised to lower chloride (Cl) levels from ~30g/L Cl to ~10 g/L Cl using reverse osmosis (RO) treatment of groundwater prior to ISR extraction. This methodology will be tested in the 2023 field recovery trial.

4.2 Process Flowsheet

A comprehensive process design criteria (PDC) was developed for the purposes of defining the key processing assumptions for this scoping study to guide flowsheet, mass and water balance development to constrain plant requirements and forecast potential production outputs. The PDC was developed by WGA in consultation with Alligator Energy, with several key assumptions agreed summarised in Table 2.

[3] *Refer AGE ASX Release 9 December 2022, "Highly Successful uranium leach and extraction tests for Samphire Uranium Project" https://wcsecure.weblink.com.au/pdf/AGE/02610588.pdf*

Table 2. Process Design Criteria Summary – High Level Summary

Area	Item	Value	Units	Source
General	Uranium In Situ	18,100,000	lb U_3O_8	AGE
	% Uranium Recoverable	70	%	AGE / WGA
	Plant Recovery Target	98	%	AGE / WGA
	Plant Design Life	10-12	yrs.	AGE / WGA
	Form of Uranium Recovered	U_3O_8	N/A	AGE / WGA
Wellfields, PLS and BLS	Plant Feed Grade in solution	100 (20 – 750)	ppm U_3O_8	AGE / WGA
	Product Grade	98 - 99	% U_3O_8	Assumed
	Target Production Rate	1,000,000	lb/annum	AGE / WGA
	Wellfield Pattern Type	5-spot	wells	AGE / WGA
	PLS Nominal Flow	585	m^3/hr	Calculated
	Wellfield Conditioning Volume	3	Pore Volumes (PVs)	Assumed
	PLS / BLS Pond Residence Time	48	hr	AGE / WGA
	Target pH	1.5 – 1.8		ANSTO Testwork
	Target ORP	450 – 550	mV	ANSTO Testwork
	98% Sulfuric Acid Rate	0.24	kg/m^3 PLS	ANSTO Testwork
	70% Hydrogen Peroxide Rate	0.10	kg/m^3 PLS	ANSTO Testwork
IX	Resin Type	Lewatit TP107		ANSTO Testwork
	Resin Loading	50	g U_3O_8 / L_{WSR}	ANSTO Testwork
	Configuration / Number of Columns	Lead (3) – Lag (3) – Elute (3)	m^3/ m^2 h	ANSTO Testwork
	Column Volume / Resin Volume	25 / 17.4	m^3	Calculated
	Lixiviant Flow / Column	11.3	BV/h	Calculated
	Uranium Conversion (pre-elution) *	Na_2CO_3		ANSTO Testwork
	Eluant Composition *	NaCl + Na_2CO_3		ANSTO Testwork
Precipitation	Hydrogen Peroxide Rate	0.26	kg/kg U_3O_8	Database
	Caustic Soda Dosing Rate	0.57	kg/kg U_3O_8	Database
Dewatering & Calcining	Centrifuge Solids Density	75	%	Assumed
	Dryer Temperature	800	C	Assumed
Reagents	Reagent Delivery Method	Bulk Tanker or		Assumed

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Area	Item	Value	Units	Source
		Bulk Tipper		
	Onsite Reagent Storage Time (H_2SO_4, H_2O_2, Na_2CO_3, NaCl, NaOH, $FeCl_3$)	10	d	AGE/WGA
Groundwater	TDS	47000	mg/L	AGE
	Cl	26000	mg/L	AGE
RO Plant	Yield (to permeate)	40	%	Assumed

*Note: some values not shown as commercial in confidence

Uranium will be recovered consecutively from wellfields in key operational stages summarised below on the block flow diagram in Figure 6. The wellfield design is based on a '5-spot' pattern comprising four injection wells per extractor well, nominally ~20-30m apart. A total of 33 extractors are required on an ongoing basis to achieve the target production rate.

1) Groundwater treatment: Reduce chloride (Cl) levels from ~30g/L Cl to ~10 g/L Cl using RO treatment of groundwater to ensure optimal IX performance. The RO water treatment plant is sized based on a 30-day conditioning period – equating to a feed rate of 25 m^3/h.
2) Conditioning groundwater: Reagent addition (40% ferric chloride, 98% sulfuric acid and 70% hydrogen peroxide) to promote uranium extraction from the orebody and lixiviant flow distributed to individual injection wells.
3) In-situ Recovery: Circulating the lixiviant within the 'mining zone'. The uranium loaded pregnant leach solution (PLS) is pumped from the wellfield by the extraction wells via common pipework to the PLS pond. Liquor from several wellfields at different stages in their life cycle will be blended to maintain the target PLS grade of 100 ppm U_3O_8.
4) Ion Exchange: Filtered PLS is pumped through, and uranium loaded onto the resin in the IX vessels. Three IX trains are required, with each containing three columns operating in a lead / lag / elute configuration. Prior to elution, loaded resin is contacted by a sodium carbonate solution. Sodium chloride solution is used to remove the uranium from the resin to produce a loaded eluate.
5) Precipitation and Thickening: Eluate from IX is precipitated using hydrogen peroxide (Sodium hydroxide used to maintain the pH of reaction) producing a uranyl peroxide ($UO_4.2H_2O$) i.e., yellowcake. The precipitate is pumped to a thickener where flocculant is added to thicken the uranium bearing precipitate to 65 wt% solids which is centrifuged to dewater the slurry to a solids content of ~ 75% w/w solids.
6) Drying and Packing: The de-watered product reports to a high-temperature drier for conversion of uranyl peroxide precipitate to tri-uranium octoxide (U_3O_8). The U_3O_8 product is cooled and drummed in ~200L steel drums, before being packed into shipping containers for transport to Port Adelaide for export.

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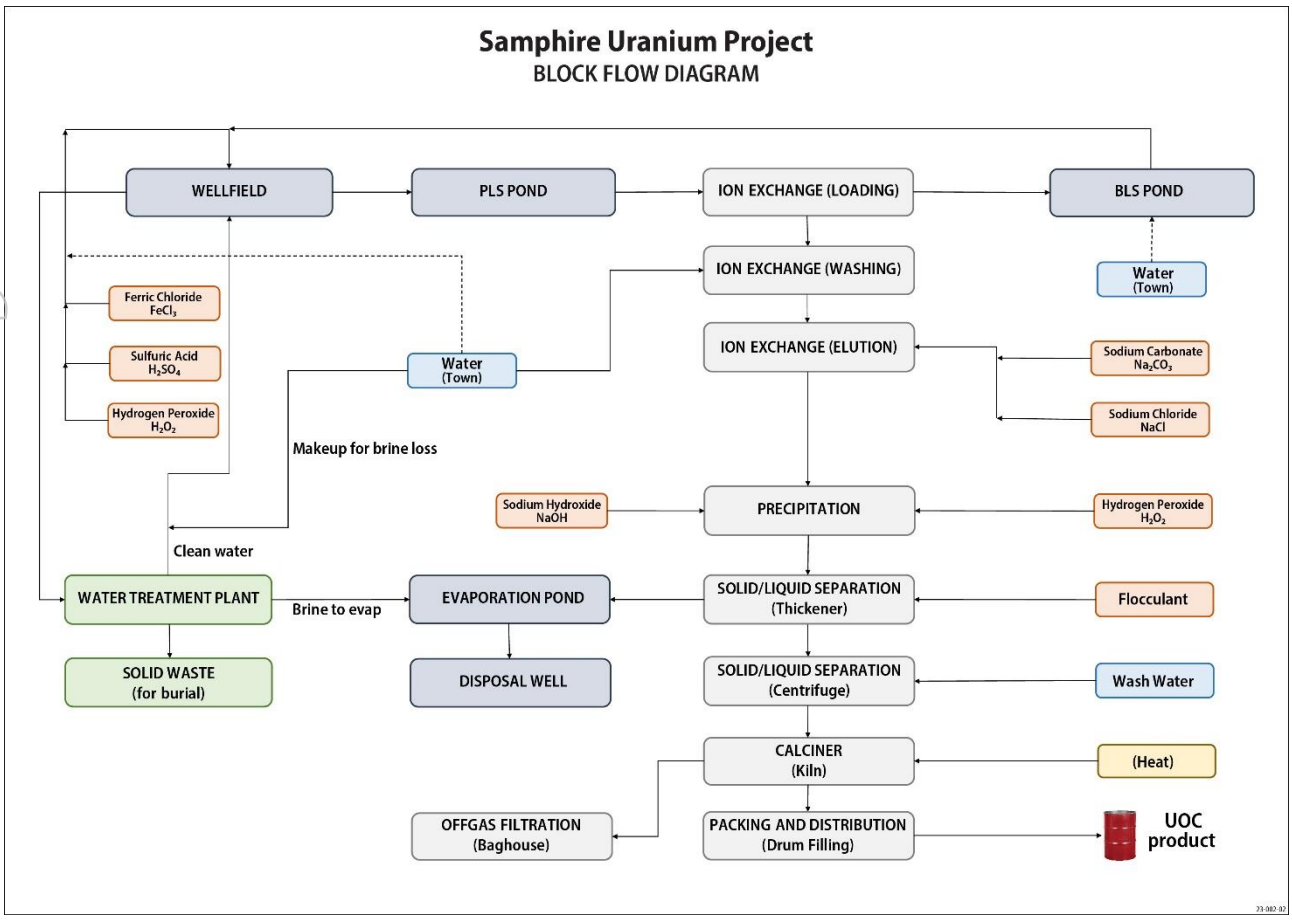

Figure 6. Process Flow Sheet Summary

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4.3 Site & Plant Layout

A conceptual site and plant layout is shown in Figure 7 & Figure 8 below.

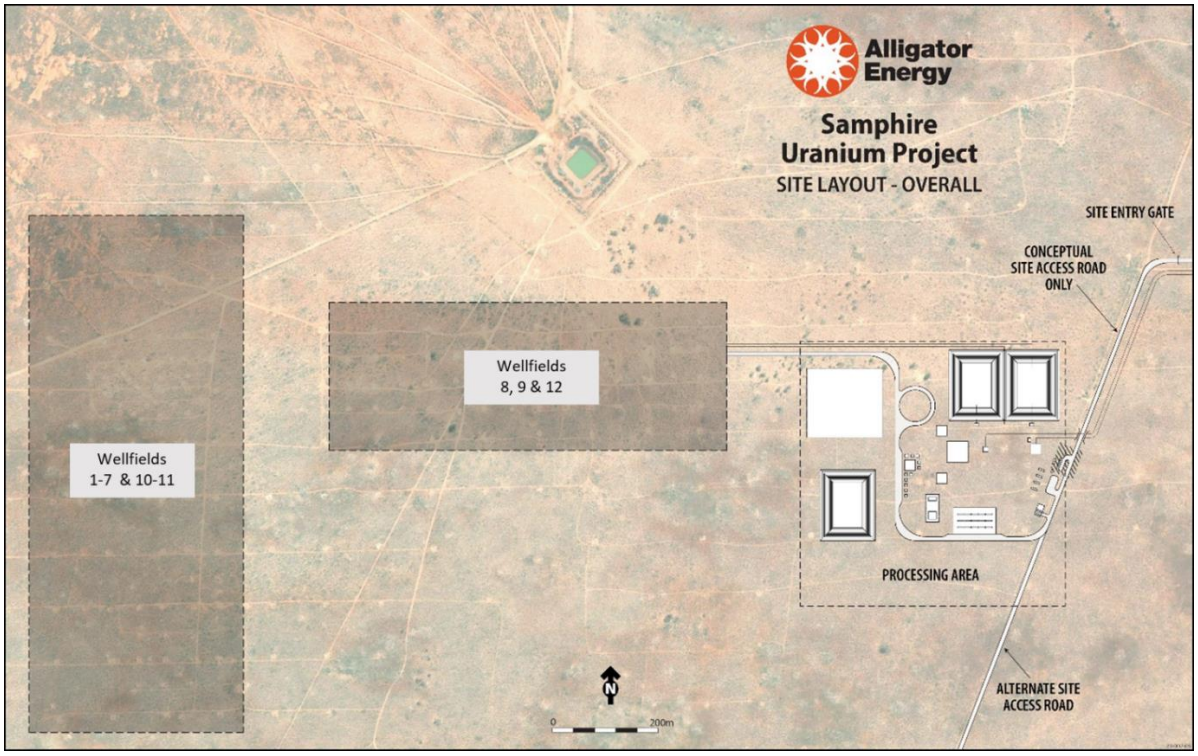

Figure 7. Site Layout

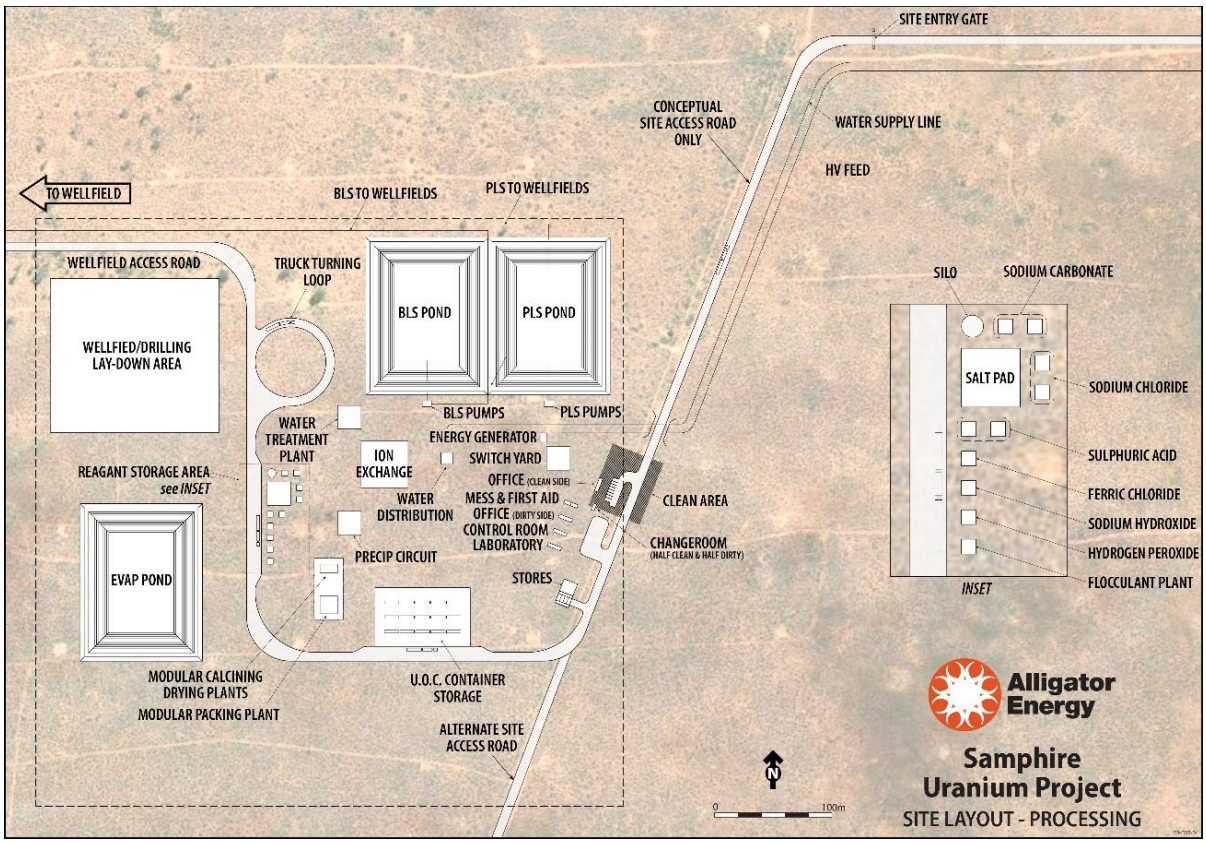

Figure 8. Plant Layout

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5.0 Environmental Assessment, Stakeholder Engagement & Closure

5.1 Environmental Assessment

Numerous baseline studies (climate, flora, fauna, hydrology, soil, groundwater, seismicity, air quality, amenity, noise, heritage) have been undertaken since 2007 to support the previous owners draft Retention Lease (RL) Proposal in 2010-2011. In consultation with South Australian and Commonwealth Government regulatory agencies, Alligator Energy has updated these studies for an RL application (currently in progress) to undertake a small ~3 extractor FRT toward the end of 2023. (Refer to ASX announcement on 31 January 2023 "Samphire Uranium Project – Community Briefing"). Upon acceptance of the RL application document by the SA Department of Mining and Energy (DEM) the document will be made public for consultation/feedback.

Environmental baseline studies will continue through to the closure of the FRT and then expanded if a decision to proceed with a full-scale operation at Blackbush proceeds. Such studies will inform important inputs into a Mining Lease application and referral of the project under the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 (Cwth).

5.2 Stakeholder Engagement

Since announcing the acquisition of the Samphire Project in June 2020, Alligator has engaged frequently and transparently with many stakeholders. These stakeholder and community engagement activities have included (so far) 97 meetings and related correspondence with the local and adjacent landholders, over 20 individual meetings with Barngarla Native Title Holders, Federal and State local Members of Parliament, various State Government departments, Whyalla City Council and peak body and business representatives. Alligator has also held two public meetings and drop-in information sessions attended by approximately 60 people, comprising members of the public and a cross section of stakeholders.

We during these interactions we have introduced Alligator Energy and the substantial uranium exploration, development, operations, environmental and rehabilitation, and marketing experience that the Company contains. We briefed stakeholders on our initial on-ground drilling and geophysics programs at the Blackbush deposit within Samphire, and more recently on the planned pilot Field Recovery Trial (FRT) and the requirement to apply for a Retention Lease (RL) from the DEM to enable a higher level of monitoring of the trial. Alligator's RL application process has included additional extensive stakeholder engagement for the FRT which is a pilot version of the full operation and thus key stakeholders have been identified and more detailed consultation commenced.

The Project's proximity to the City of Whyalla, which currently provides the workforce for the extensive Whyalla steelworks, port and surrounding mines, is advantageous to Alligator in terms of current and future workforce resourcing (at time of completing the Study we have our first three locally based employees). As well as engaging with the Whyalla business community about the Project, we have also utilised ~30 businesses in Whyalla for services and supplies to date and expended over A$800,000 since late 2021.

In our discussions so far, in general the Whyalla community has been very supportive, with a recognition that diversification of Project and business opportunities is vital for the city, plus the 60 to 70 local jobs that the Project could create. South Australia is one of Australia's most uranium

supportive States with established regulatory procedures, uranium transport logistics, and a number of operating/approved ISR projects. Many stakeholders have either worked in or had business interactions with uranium mining projects also.

5.3 Closure

Staged mine closure and rehabilitation activities have been incorporated into the basis of estimate for the Scoping Study. Rehabilitation of resource and exploration drill holes is ongoing with that work. Commencement of wellfield rehabilitation will occur as soon as practical after the completion of mining of a wellfield (these may last from 12 to 24 months depending on quantity of contained uranium), with this continuing through the life of the Project. Final closure of mining operations will largely be limited to the most recent active mining area and the dismantling of plant surface facilities.

6.0 Infrastructure

6.1 On-site

This Scoping Study includes the following on-site facilities to support both mining and processing operations.

Main processing and infrastructure components include:

- ISR Wellfields.
- Solution ponds.
- Groundwater & BLS bleed treatment plant.
- Reagent storage facilities.
- Processing plant (including ion exchange, precipitation and thickening).
- Dewatering, Calcining (drying) and packaging plant.

Supporting facilities/infrastructure include:

- Electricity transmission line.
- Groundwater monitoring network.
- Laboratory & workshops.
- UOC storage area
- Administration building.
- Messing facilities.
- Sewage treatment plant.
- Waste disposal facilities.
- Reverse osmosis (RO) plant, raw and potable water tanks.
- Site access roads.

6.2 Power

An initial power supply study was undertaken to evaluate options for the power demand requirements. The average plant load has been estimated at 1.2 MW based on the mechanical equipment list. An allowance of up to 5 MW has been assumed to allow for contingency and future expansion.

Given the proximity of the plant to the city of Whyalla, and the relatively low power demand of < 5 MVa, the most viable power supply option appears to be a connection to the existing network. The

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Study includes a new 33kV power line from Whyalla to the site. This overhead line is expected to be approximately 35km in length along an existing easement for the majority of the route.

An 11kV line was also considered, but on review was deemed too risky given the length of the line. However, it may be possible and should be studied later (potential for significant cost reduction). As a possible alternate, there are a number of external companies investigating renewable power generation projects in the region, including on properties to the south of Whyalla. Hence it may be possible to link into these for future offtake supply.

The next phase of the Project (additional infrastructure study, or feasibility study) is expected to include:

- SA Power Networks initial investigation into source / start of power line and route
- Investigate whether an 11kV or 33kV line is required.
- Pricing agreement investigation / capital split.
- Determine potential for renewable power from future projects.

6.3 Water

The proposed UOC production facility requires a desalinated water supply for final processing. Groundwater samples from bores have shown that in the vicinity of the plant the water is hypersaline thus not making it viable for the processing plant. Currently the most viable water supply identified is an existing pipeline that terminates on the Mullaquana Road just outside Whyalla. A potential future supply is desalinated water from the proposed Northern Water RO plant – Alligator are engaging with that group to ascertain future supply possibilities.

Preliminary calculations identified the need for approximately 25 - 50 m^3/hr of water. The pipeline allowed for as part of this Scoping Study has significant latent capacity well in excess of mass and liquor balance requirements. A new pipeline approximately 20 km in length would be required to connect the plant to the existing water source (Figure 9). The new pipeline would be poly (HDPE) and is assumed at this stage to be installed above ground. This assumption will require further validation during the next phase of the Project, and it may be that the line will need to be buried.

As a part of the water supply study, SA Water was contacted to assess two key items; namely whether a new connection is possible and if the quantity of water required is available at the identified location. The preliminary assessment by SA Water found the following:

- A new connection to the end of the pipeline on Mullaquana Road is highly likely.
    - A definitive answer requires a full assessment which will not be conducted until the Project is further into the planning phase.
- The water demand assessment of 25 m^3/h was not considered a large burden on their system.
- SA Water flagged other major projects such as the proposed hydrogen plant that would require large amounts of water if they proceed.
- The 2022-23 water use price for commercial customers was used for Opex calculations with an appropriate price increase to allow for operation and maintenance of the pipeline, as well as minor upgrades to the upstream SA water system.

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- The Alligator Energy – Samphire Project has been added to the list of potential clients that may need water in the region. Thus the required supply is now considered as a possible future demand.

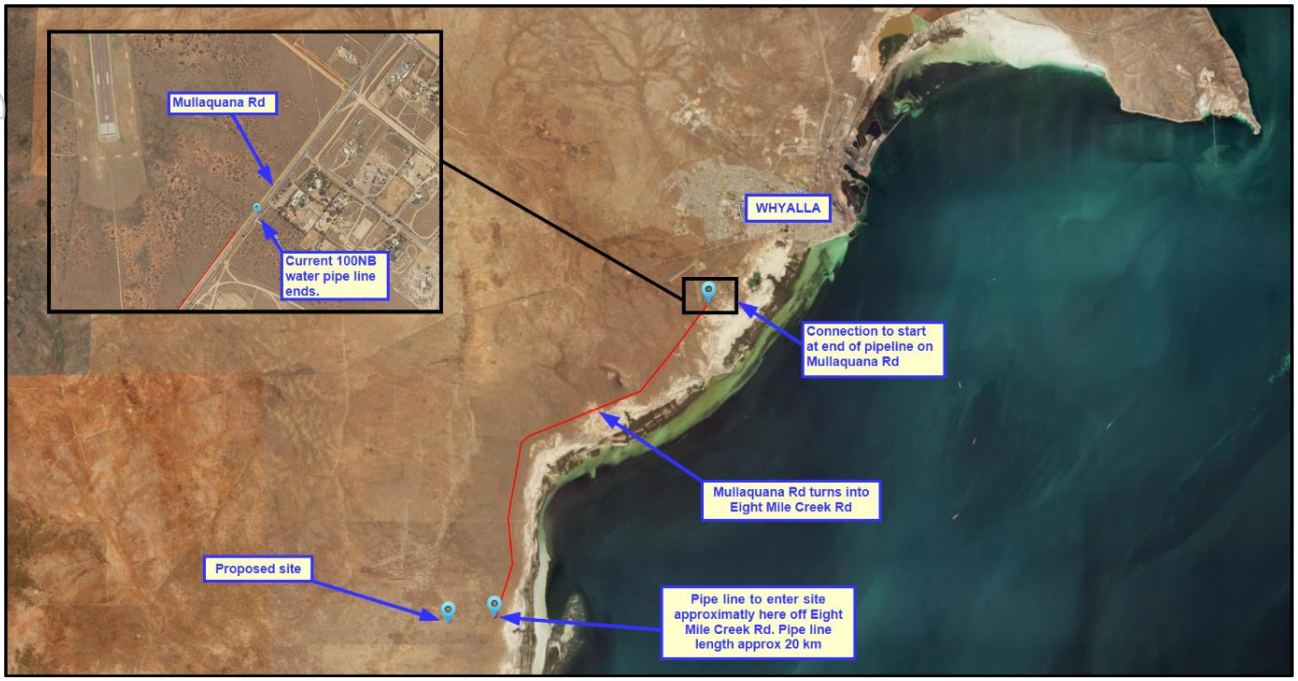

Figure 9. Conceptual location of new water supply pipeline

Future phases of the Project should investigate the following with respect to the clean water source:

- Confirm placement and location of pipeline (i.e., along existing Mullaquana and Eight Mile Creek Roads).
    - This includes engagement and validating the installation of the pipe above ground vs underground.
- Confirm final flow and pressure requirements of the UOC production facility.
- Conduct design study on the new pipeline and confirm the following:
    - Final pipe specifications (size, material and pressure rating)
    - Booster pump location, size and power requirements (if required)
- Engage all landowners along route where pipe will run.
- Engage SA Water to provide a full assessment of the water supply option.

6.4 Roads

For site access, an existing Council maintained road extends along Mullaquana Road, becoming Eight Mile Creek Road, to the pastoral property gate through which access to the site is gained. Alligator will work with both the pastoralist whose property the Blackbush deposit sits on and the adjacent pastoralists, plus the Barngarla group to firm up preferred road access into the site. Currently Alligator and the pastoralist associated with the Blackbush deposit have agreed a 50m corridor for the planned pilot Field Recovery Trial planned for later this year and this may become the main access for a future production facility.

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Road traffic numbers have been estimated, and while not excessive (this is a relatively compact operation), these will be subject to engagement with pastoralists and residents along Mullaquana and Eight Mile Creek Roads. There will be regular weekly truck movements delivering processing plant consumables, and also approximately two trucks per month taking a 20ft shipping container each of drummed and packaged UOC from the site (refer section 6.5). Employees operating on the plant will mostly be Whyalla based, hence there will be a number of light vehicles (estimated at 8) and a mini-bus taking employees to and from the site each shift.

6.5 Product Transport and Shipping

The final product of a future potential ISR uranium operation as outlined in the Study is a Uranium Oxide Concentrate (UOC), containing approximately 89-99% U_3O_8. At the product packing section of the processing plant, the product will be drummed into 200 litre steel drums, sealed according to ASNO nuclear safeguards standards, and the drums packed and secured into a standard 20ft shipping container containing 20t of UOC. The production from the proposed 1 Mlbs U_3O_8 p.a. plant equates to approximately 454 metric tonnes of UOC, or around two (2) containers per month of product.

Following receipt of relevant approvals and permits required for the shipment and export of UOC, product will be transported by road train from the Samphire Project along Eight Mile Creek Road / Mullaquana Road, through Whyalla to Port Augusta, and then on to Port Adelaide along Port Wakefield Highway for shipping by third parties to a converter facility. The Port Augusta-Port Adelaide route is currently permitted and used to transport UOC from the Olympic Dam mine to Port Adelaide. Alligator will work all stakeholders to firm up preferred road access from site though Whyalla which will be incorporated into Alligator's Transport Management Plan that meets the Code of Practice for the Safe Transport of Radioactive Material 2019 and also the South Australian Radiation Protection and Control (Transport of Radioactive Substances) Regulations 2018, under the Radiation Protection and Control Act 20211.

7.0 Capital Cost Estimates

Forecast pre-production capital expenditure to develop the Project as reflected in this Scoping Study is A$129.3M (A$123M - A$136M) including a significant combined contingency and cost escalation allowance of 40%. The Capex estimate, which has an individual component accuracy of +/-50% is summarised in Table 4. Note that total sustaining capital across LOM is outlined in the Section 8.

Key items from the capital cost basis of estimate are summarised below.

- The mechanical equipment list (MEL) was used as the basis of all other discipline direct costs.
    - Piping, electrical and instrumentation, steelwork, concrete and architectural costs are based on a percentage of supply and install of mechanical equipment. These percentages are based on database figures.
    - Mechanical equipment costs were sourced from WGA's in-house database, escalated historical pricing and budgetary quotations.
    - Freight allowances were applied to mechanical items as a percentage of the supply cost (7% domestic, 15% international).

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- The all-in labour rate applied to the estimate is inclusive of base rate and allowances, personal protective equipment, construction plant / equipment, cranage, small tools and consumables, project, safety and quality management, mobilisation and demobilisation and, contractor overheads.
- UOC drying and packaging plant costs are based on modular, containerised solutions.
- The Capex assumes that AGE will cover 75% of total capital costs (A$7 million total) for the new overhead transmission line. The remainder is assumed to be covered by the grid operator.
- The Capex includes an allowance for $2M for the water pipeline from Whyalla inclusive of booster pumps.
- Wellfield development costs (wellfields + wellhouses) are based on operating experience at similar depths & are sourced from Alligator's internal database.
- Process ponds assume a volume of ~28,000 m^3 and are fully lined.
- Allowance for five (5) additional monitoring wells is included assuming all monitoring wells installed as part of the planned FRT will be utilised in full scale operation.
- An allowance of $250,000 has been made for the earthworks and construction of a low-level radioactive waste facility.
- A first-fill allowance for IX resin is included for the 9 columns – each containing ~17.2 m^3 of resin. This cost is included within the process plant line item.
- Reagent stock tanks have been sized to accommodate a minimum of 10 days consumption.
- In-direct costs are based on percentage factors of direct costs,
    - Common distributable - 7% of direct costs.
    - Commissioning support – 1.5% of direct costs.
    - Owners Costs - 5% of direct costs.
    - EPCM - 15% of direct costs + construction indirects.
    - Project Contingency and Growth - 30% of all directs + indirects (excluding escalation)
    - Project Escalation - 10% of all directs + indirects (including contingency and growth)

Table 3. Capital Cost Estimate

Item	AUD	% Of Total
Earthworks & Drainage	$4,000,000	3%
Process Plant	$42,162,355	33%
Non-Process	$16,816,472	13%
Power and Comms	$5,250,000	4%
Directs - SUBTOTAL	**$68,228,827**	

Item	AUD	% Of Total
Construction Indirects	$6,740,594	4%
Site Vehicles	$1,000,000	1%
Owners Costs	$3,411,441	3%
Engineering, Contingency and Escalation	$11,245,413	9%
	$26,887,882	21%
	$11,751,416	9%
Indirects - SUBTOTAL	**$61,036,747**	
TOTAL	**$129,265,574**	100%

8.0 Operating Cost Estimates

Average cash operating costs are estimated at A$25.59 / lb U_3O_8 (US$17.92 /lb U_3O_8) with a range of A$24.31 / lb - A$26.87 / lb) and an AISC (including transport, shipping, royalties and sustaining capital) of A$43.19 / lb U_3O_8 (US$30.23 / lb U_3O_8) with a range of A$41.03 / lb to A$45.35 / lb.

The unique location of the Samphire Project has several benefits including short connection distances to established water and electricity networks, no requirement for a fly-in fly-out (FIFO) workforce, removing the need for specific site-based accommodation, messing, flights and remote allowance loaded salaries. The local workforce is also highly skilled given it already services the GFG Alliance / SIMEC Mining integrated mines and steelworks, plus the northern mining centres of Olympic Dam, Prominent Hill and Carrapeteena, as well as surrounding pastoral, farming and business enterprises.

No contingency has been applied to the operating cost estimates and the limited number of items quoted in US dollars use an exchange rate of 1 A$ = 0.70 US$ Table 4 provides a breakdown of key components of the forecast which was built base-up, and considers labour requirements, reagent consumption and consumables, utilities (power/water), laboratory costs, maintenance, and general/administration.

Key assumptions are summarized as follows:

- Workforce is DIDO ex. Whyalla. This initial project assumes a workforce of around 65 people during normal operations inclusive of wellfield drillers and rehabilitation. There will be a higher number during construction and commissioning.
- Power supply = $120 / MWh
- Water Supply = $2.89 / kL (+$1.10 / kL allowance for ongoing operation and maintenance costs for water supply pipeline)
- RO plant sized for a feed rate of 25 m^3/h and assumes 3 x PVs required for 90% chloride removal.
- Reagent costs are based on pricing from similar operations, database figures and budget pricing obtained during the Study. Reagent consumption rates have been determined from the mass and water balance (derived from PDC / testwork).

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- Maintenance costs were estimated as a % of mechanical equipment. Percentages were modified for each plant area considering the level of complexity of mechanical equipment.
- Laboratory costs developed from a list of assay requirements (product, metallurgical testing, water quality, environmental) and then estimated from WGA databased values.
- General and administration costs are factored on overall labour costs:
    - A $250,000 per annum allowance covering progressive site rehabilitation and closure costs is included within general and administration.
- Transport, shipping and marketing is ~$4.50 US$ / lb (based on historical pricing).
- Royalties applied are the South Australian standard of 5% of mineral value.
- UOC sale price of US$ 65 / lb based on the long-term price outlook for UOC.

Sustaining capital is excluded from the Operating Cost Estimate but included as part of the AISC comprising future wellfield drilling and construction, product marketing, shipping, and royalties.

Table 4. Operating Cost Estimate

Cost Area	$ per annum	AUD $ / lb U_3O_8	USD $ / lb U_3O_8	% Of Total
Labour	$8,565,000	$8.57	$6.00	20%
Power	$1,926,377	$1.93	$1.35	4%
Water	$1,935,415	$1.94	$1.35	4%
Reagents and Consumables	$5,451,581	$5.45	$3.82	13%
Laboratory	$1,166,820	$1.17	$0.82	3%
Maintenance	$2,161,625	$2.16	$1.51	5%
General and Administration	$4,387,390	$4.39	$3.07	10%
Total (OPEX)	**$25,594,207**	**$25.59**	**$17.92**	**59%**
Product Transport, Shipping, Marketing & Royalties	$11,321,429	$11.32	$7.93	26%
Sustaining Capital (incl. estimated wellfield drilling / construct)	$6,272,515	$6.27	$4.39	15%
Total (AISC)	**$43,188,151**	**$43.19**	**$30.23**	**100%**

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9.0 Financial Analysis

The financial estimates for the Samphire Project as reflected in this Scoping Study were developed using a discounted cash flow model. The model assumes an owner-operated Project through to a packaged product with transport and shipping by third parties to a converter facility.

9.1 Basis of Estimates

The financial estimates were prepared under the following assumptions:

- A real discount rate of 8%;
- An exchange rate of 1 AUD to 0.70 USD
- Costs are quoted in real Australian Dollar December 2022 terms with minimal exposure of both the Capex or Opex costs to fluctuations in the A$:US$ exchange rate;
- Cash flow periods are expressed on an annual calendar year basis;
- Production Target over the Life of the Mine of 10M/lbs U_3O_8
- Annual production target of 1M/lbs U_3O_8 per annum will be achieved in year three of the Life of Mine and a decline will occur in the last two years of production;
- Uranium sales revenue is assumed to be realised approximately three months after production;
- All costs are stated exclusive of GST;
- South Australian royalties of 5% have been applied to the pre-tax cashflows with no royalty holiday assumed;
- Australian corporate tax rate of 30% has been applied to pre-tax but post-royalty cashflows;
- The Company's current accumulated carried forward tax losses together with an estimate for additional eligible pre-production losses has been assumed as being available to offset against taxable income in the early years of the production profile;
- All quantities are stated in pounds (lbs)
- A one-off closure / end-of-mine cost is included within year 12 of $5 M

9.2 Uranium Market Outlook and Product Marketing

The nuclear power industry has been under significant focus and growth for several reasons over the past three years or so, with major events including:

- Global concerns about climate change are directing Governments and companies to source low or zero emissions electricity generation – nuclear power is one of the lowest emitters.
- New countries entering into the nuclear power space, with around 22 new countries either developing projects, enacting legislation, or investigating and planning these.
- Positive sentiment and support from both major parties in the US for the first time and have recently passed the Inflation Reduction Act which includes substantial support for nuclear power and US based nuclear fuel development, and phasing out of Russian nuclear fuel supply.
- The Ukrainian conflict is pushing western nuclear countries and utilities to reduce their reliance on Russia as a nuclear fuel supplier.
- 12 European countries now aligned and supporting maintaining and enhancing their nuclear fleets or investigating nuclear power new builds for future energy sources alongside renewables. They are also advocating for nuclear to other EU countries.

- The European Union has included nuclear power in its 2022 taxonomy report which considers nuclear as a sustainable energy source.
- Continued build of new nuclear plants, with around 47 reactors currently under construction.

This improving demand has occurred at a time when many previous uranium mines were either shut down, reducing output or on care and maintenance. Since the improved uranium demand signals in late 2020 many existing uranium projects have initiated re-start plans and with some now under production recommencement plans. Nuclear utilities have increased the level of long-term contracting (over 53 contracts put in place in 2022), which is more supportive than the spot market for uranium mining re-starts or new start-ups.

The spot uranium price at time of finalising this report was around US$51 per lb U_3O_8 and the long-term price published by market commentators had moved up to US$53 per lb U_3O_8. Industry information is that some long-term contracts with structured formula prices may have a fixed price component in the mid to high US$50's per lb. The US DOE has put in place some purchase contracts, specifically for US produced uranium, ranging from US59$ / lb to US$70 per lb U_3O_8.

It is against this improving supply demand and uranium price backdrop that Alligator Energy is working through the necessary steps to determine the potential for our Samphire Project. Alligator has, through and with its uranium marketing agent, Traxys North America (Traxys), met with and introduced the Company to a range of nuclear utilities in Europe and the US. All of these parties are interested in new future uranium supply. From these meetings and Traxy's work, Alligator Energy is now on the tender list for Requests for Proposals for Uranium Supply from a range of nuclear utilities.

Based on the forward-looking curves for uranium supply / demand, the improving price, and the technical, approvals and development path for Samphire, we believe the base case price of US$65 per lb U_3O_8 used in this Scoping Study is realistic for offtake contracts in the time frame shown on our schedule.

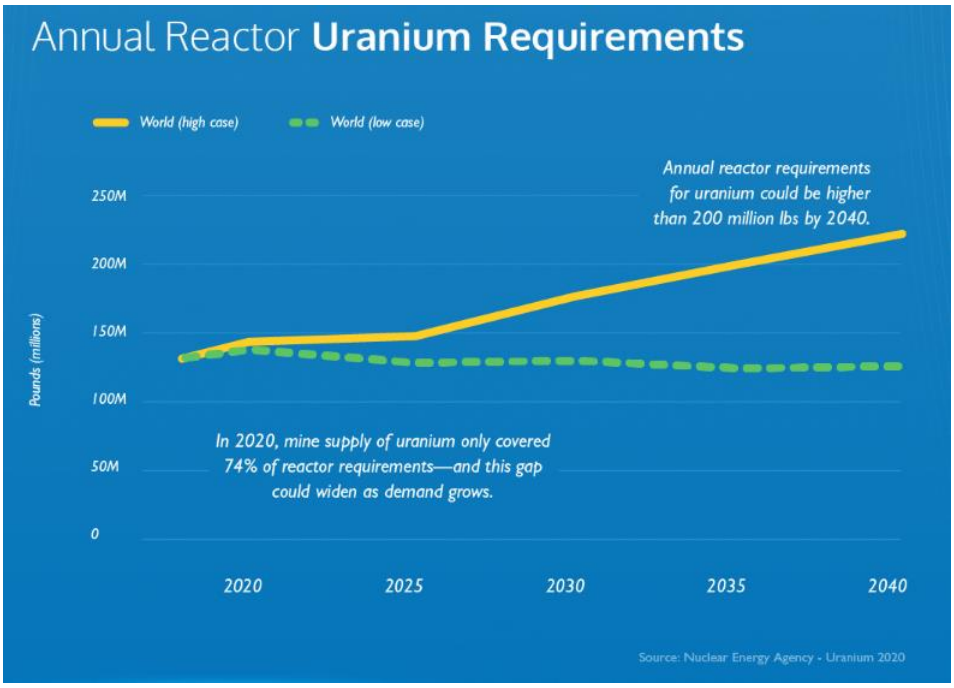

Figure 10. World supply/demand
Source Visual Capitalist https://elements.visualcapitalist.com/

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9.3 Economic Analysis

The forecast key financial metrics associated with the development and operation of the Samphire Project as reflected in this Scoping Study are summarised in Table 5.

Table 5. Key Financial Metrics

Metrics	Unit		Total
Price inputs			
LOM average uranium price	US$/lb U_3O_8		65
US$:A$ (revenue calculation only)	A$		70 cents
Valuation, indicative returns and ratios		**Range**	**Mid-point**
NPV_8 (post-tax, real, ungeared)	A$M	**144 - 160**	**152**
NPV_8 (pre-tax, real, ungeared)	A$M	176 - 194	185
IRR (post-tax, real, ungeared)	%	**27.6 – 30.5**	**29**
IRR (pre-tax, real, ungeared)	%	29.5 – 32.6	31
Payback period (post-tax from first production)	Years	**3.31- 3.65**	**3.48**
Cashflow summary			
Sales revenue (gross)	A$M	883 - 975	929.0
Processing Opex	A$M	(211 – 233)	(222)
G&A Opex	A$M	(44 – 48)	(46)
Cash operating costs	A$M	**(255 - 281)**	**(268.0)**
Transport, shipping, marketing and royalties	A$M	(107 - 119)	(113)
Sustaining capital (incl. ongoing wellfield development) – net of residual	A$M	(49 - 55)	(52)
All in sustaining costs (AISC)	A$M	**(412 - 454)**	**(433)**
Pre-production capex	A$M	(123 - 135)	(129)
Tax Paid	A$M	(58 - 64)	(61)
Net Cashflow (post-tax)	A$M	**291 - 321**	**306**
Unit operating costs			
Cash Operating Costs (ex royalties)	A$/lb U_3O_8	**24.3 - 26.9**	**25.6**
AISC	A$/lb U_3O_8	**41 – 45.4**	**43.2**
ASIC in US$	US$/lb U_3O_8	**28.7 – 31.7**	**30.2**

The projected LOM cashflow is shown in Figure 11. The Project is expected to achieve a pre and post-tax payback (due to the tax shield provided by the carried forward accumulated losses) of approximately 3.5 years from first production.

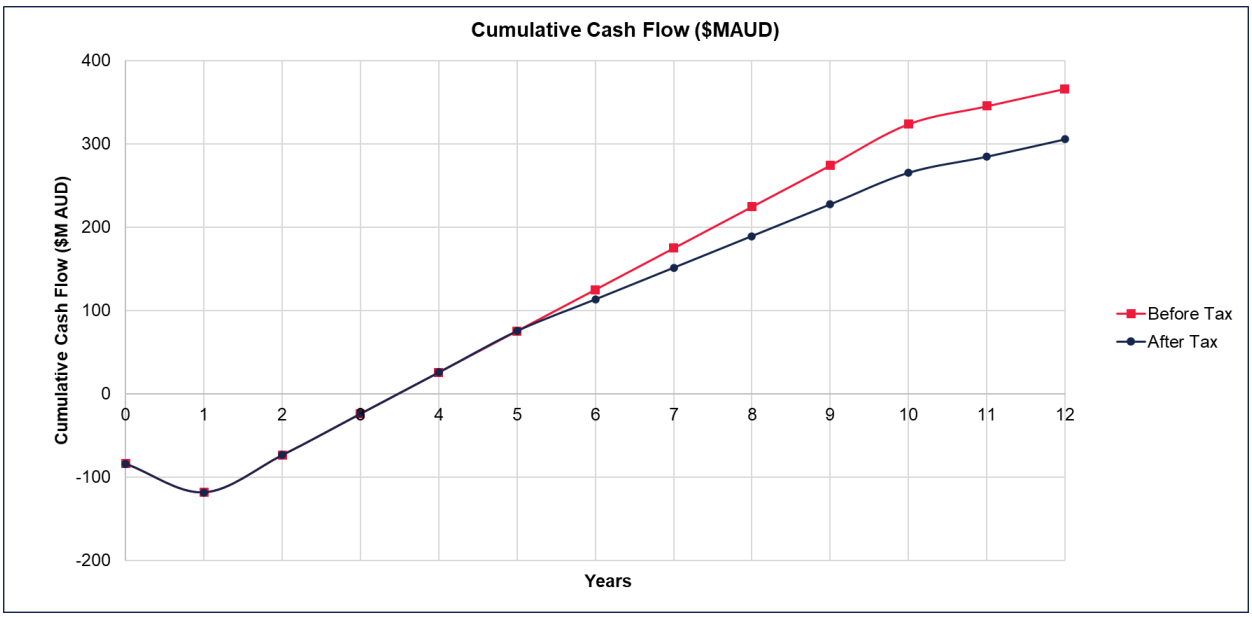

Figure 11. LOM Cumulative Cash Flow

9.4 Sensitivity Analysis

The sensitivity analysis undertaken on the Samphire Project examined variation in each of the following key parameters:

- U_3O_8 sales price per lb;
- Cash operating costs;
- Pre-production capital; and
- A$:US$ Exchange Rate fluctuations

An additional one-off sensitivity case was based on an estimate of increasing the maximum annual production rate to 1.1 Mlbs pa, with a corresponding shortening of the production life to 11 years. This single point change would increase the post-tax NPV_8 to a range of A$153 M to A$169 M, or 6% increase in the NPV midpoint from A$152 M to A$161M.

In assessing the sensitivity of the Project economics each of the above parameters has been varied independently of the others. Consequently, a combination of variations in these parameters will have a more marked effect on the forecast economics than the individual variations that are presented. There is also the possibility of variations in opposite directions which could have a negating effect.

It should be noted that negative sensitivities are adjustments that reduce the Project economics or NPV value (e.g. increased pre-production capital costs) and correspondingly positive sensitivities are adjustments that improve the project economics and NPV. The sensitivity analysis highlights that only in one instance of the variables operating independently within the selected range would the project economics be less than zero.

Figure 12 sets out the outcomes of the sensitivity analysis on the post tax Project NPV.

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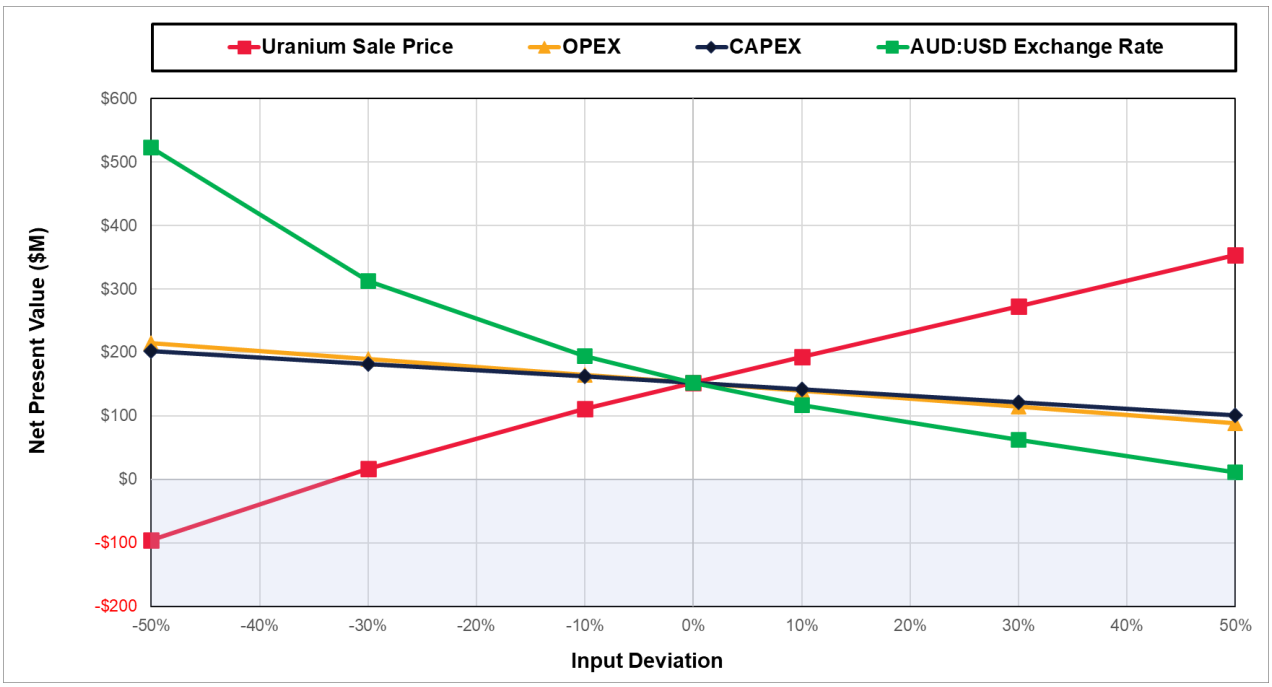

Figure 12. Spider Chart- NPV Sensitivity Analysis

10.0 Development Schedule

Alligator plans an ongoing resource and exploration drilling program at the Blackbush Deposit over the forthcoming years with the objective of both upgrading confidence in the JORC compliant resource to a feasibility study level (Measured and Indicated classification) along with targeting an increase in the ISR amenable resource estimate.

The Company is also engaging with the adjacent pastoralist to the south for future exploration work on known palaeochannels, and plan work on the existing Plumbush deposit (possible small satellite operation).

A field recovery trial (FRT) post completion of the required approvals process is targeted for late 2023 to confirm the bench scale uranium leach and ion-exchange extraction tests conducted by Australian Nuclear Science and Technology Organisation (ANSTO). This will also contribute to or confirm the hydrogeological model accuracy and groundwater neutralisation testwork.

Full mineral lease approval (referred to as Full Mining Approval) for the Samphire Project is planned to commence during 2023 with completion targeted in tandem with a final investment decision (FID). The timing for this is estimated only, and based on similar mine approvals in South Australia while recognising the extensive base line environmental work that has already been done, but also recognising that this will be the first uranium mine in this particular regional location. During the approval process the Department for Energy and Mining will call for submissions from stakeholders, and Alligator will be asked to respond to these. Accordingly the Company's engagement with the local and regional community and other stakeholders will be ongoing right through this process. As part of this Alligator is currently seeking advice from a consulting group regarding a future Social Impact Assessment process for the Project.

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Alligator has already engaged with potential future customers through meetings with nuclear utility groups from the USA, Europe and the UAE. We have verified that there is interest and a high potential to put in place early conditional contracts for a percentage of future production and increase this as we move through the approval process.

It is estimated that a Definitive or Bankable Feasibility Study will take up to 9 months with the objective of completing this in conjunction with increased engagement with prospective project financiers. It is envisaged that Alligator will continue to fund the feasibility, approvals and pre-development work, with a Project FID decision based around separate financing.

Construction of the Samphire Project, post FID, is anticipated to take approximately 18 months.

The estimated Project development timeline is set out in Figure 13.

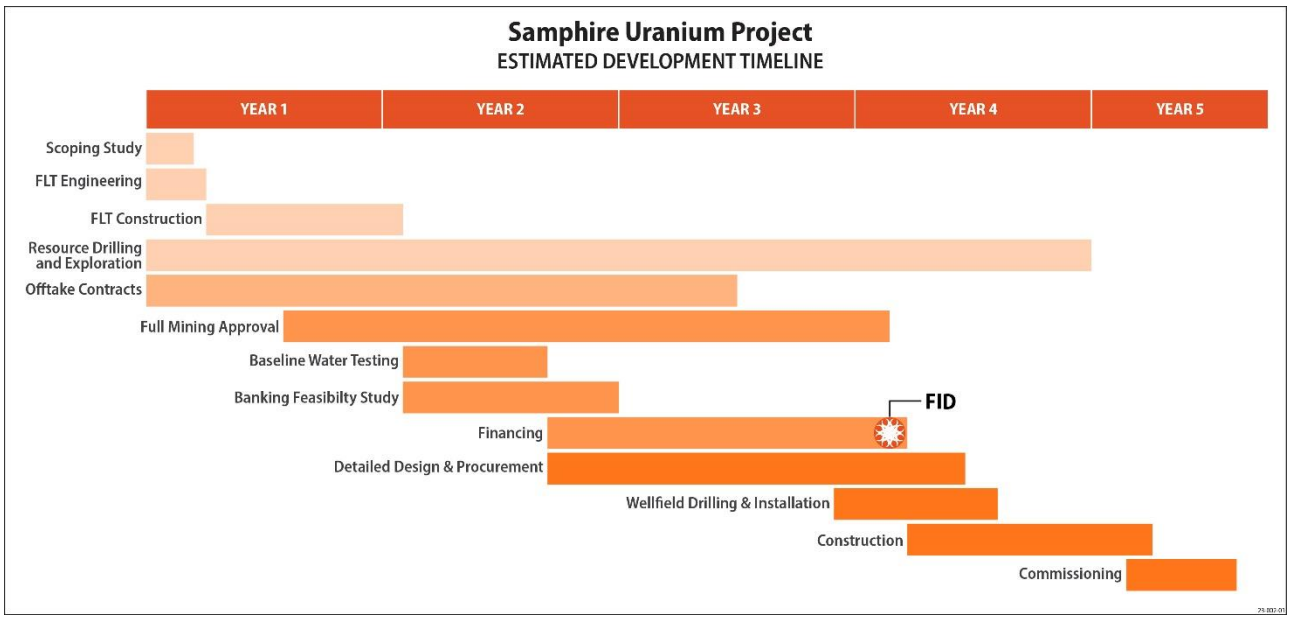

Figure 13. Estimated Development Timeline

11.0 Project Risks

A risk assessment workshop was conducted as part of the Scoping Study to consider the specific technical risks associated with the Project. These risks in conjunction with certain broader project development risks will be considered during the various studies associated with the Full Mining Approval and bankable feasibility study, namely:

1) Pregnant liquor assumption which if not achieved may lead to poor plant performance and reduced production capacity, cashflow and profitability - whilst the Scoping Study assumption was benchmarked against other ISR deposits, the planned mitigation is to validate during the FRT.

2) High chloride levels in ISR wellfields have been shown to negatively impact resin performance (loading efficiency) reducing production capacity. Pre-treating the wellfield with reduced salinity

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water to lower chlorides will be investigated as part of the FRT. Alligator will also investigate possible changes to the IX configuration to explore plant changes that can be made to eliminate the need for wellfield pre-conditioning.

3) Vehicle driving to and from the site, and heavy vehicle / light vehicle interactions may increase health and safety risks and could cause equipment damage – a detailed traffic management plan will be built into the detailed design phase to ensure road travel safety and minimise any interactions.

4) Supply chain risks including ability to procure, on a timely basis, the required high chloride tolerant resins – early engagement with key suppliers is planned including testing of alternate resin supplier samples (already underway) and possible early procurement.

5) Water and power supply options will require further evaluation, in particular where renewable power may be an option due to the overall low power requirement. New pipeline infrastructure will require various approvals notably with landholders and council.

6) Community engagement – the engagement conducted to date in the broader Whyalla community has identified high levels of support from the perspective of increased employment opportunities and diversification of business along with local economic benefits for suppliers. The engagement has also identified some stakeholder concerns in relation to saline ground water contamination and possible pastoral land impact. Ongoing consultation will be required to further understand the concerns raised and build confidence in the science and models developed, and the testing of these (e.g., FRT), and to ensure benefits are delivered in line with the community expectations.

7) Concentrate handling/transport – uranium oxide drums loaded and secured into 20 ft containers will be trucked to Port Adelaide via main highways (approx. two containers a month). There is a risk of a traffic accident – similar accident, recovery and clean-up plans as other uranium mine sites have in place will be developed and implemented. Uranium oxide is a relatively coarse, heavy material, not easily wind-borne, easily detected with a radiation counter, and can be cleaned up safely with equipment and hand shovels with operators wearing standard dust masks.

8) Off-take arrangements – successful negotiation of these arrangements will be required to underwrite a portion of the planned production for funding purposes and ongoing stability of returns.

9) Additional risk factors include changes in the A$:US$ exchange rate (principally sales revenues) and long-term uranium prices, changes to material and labour costs, appetite of equity and debt funders leading up to FID and supply chain risks associated with the construction phase.

12.0 Project Opportunities

As Alligator advances the Samphire Project it will continue to identify potential to enhance and add value to this initial Scoping Study. There are some early opportunities for this, including but not limited to the following:

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- Targeting further increases to the Blackbush ISR amenable resource estimate, as major capital components have been sized for 1.2Mlbs pa U_3O_8 production facility. This will provide a solid opportunity to study an increased production target with minimal additional capital. Drilling has already commenced in 2023 on the Blackbush deposit, initially to install ground water monitoring wells for the pilot FRT trial, then leading onto rotary mud drilling for resource extensional and upgrade drilling.

- While previously around 100 rotary mud holes were planned from October 2022 to April 2023, drilling will now be continuing beyond this, with an aim to have an additional resource upgrade during the second half this year.

- Further exploration for future uranium mineralisation potential, including the potential for the Plumbush prospect to become a satellite deposit.

- Additional studies ahead of a planned full feasibility assessment during 2024 to consider power and water supply and alternates. It may be possible to make the power line from Whyalla an 11kV line rather than 33kV, which would result in substantial savings. The option to use a high portion of renewable power could lower unit power costs.

- A range of project optimisation opportunities will continue to be pursued, for example the level of pre-conditioning needed through RO to achieve reasonable IX loadings, better resins, and any IX plant improvements possible.

- The elution process (recovery of uranium from loaded ion exchange) requires further testwork to optimise reagent consumption. Sodium carbonate consumption presents as the most significant cost saving opportunity.

13.0 Reasonable basis for funding assumption

Alligator believes that the Scoping Study provides reasonable grounds to believe that the Samphire Project will be a sufficiently economically viable project to enable funding to be procured to enable its development and operation. To achieve the range of outcomes indicated in this Scoping Study, pre-production capital funding of in excess of A$135M (including working capital) is expected to be required.

A prerequisite for Alligator to attract future funding, in the form of both debt and equity, will require the completion of a bankable feasibility study that demonstrates at a high confidence level that sufficient financial and technical outcomes exist to satisfy the providers of such funding.

There is no certainty that Alligator will be able to source the required amount of funding. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of Alligator's shares. It is also possible that Alligator could pursue other value realisation strategies such as a sale, partial sale or joint venture. This could materially reduce the Company's proportionate ownership in the Project.

The basis upon which the reasonable grounds for pre-production capital and working capital is established includes:

- As the world looks for low emission energy sources, nuclear power is being seen as an important part of the energy mix. Many countries around the world are enhancing their existing nuclear fleets, investigating new builds, and in particular investigating the advent of Small Modular Reactors (SMR's). Along with this, nuclear utilities are preferentially sourcing nuclear fuel supply from stable and experienced jurisdictions – South Australia has >35 years of safe and stable uranium production and regulatory experience.
- The technical and financial parameters detailed in the Scoping Study are sufficiently robust and globally competitive. This outcome along with the modest pre-production cost relative to global open-cut uranium operations and the Project's location in a stable and supportive jurisdiction provide a solid platform for Alligator to advance discussions with a number of potential funding providers.
- Subject to supportive pricing and the terms of future offtake arrangements (for a portion of the production profile), Alligator believes that an element of the pre-production capital funding could be sourced in the form of debt from sources such as banks, bond markets, specialist mine financiers and/or offtake partners.
- The Company has an ongoing agency agreement with Traxys North America LLC (Traxys) for U_3O_8 marketing services which has enabled early engagement with a number potential offtake nuclear utility customers, some who have expressed interest in early conditional long-term contracts. Along with this, the Traxys arrangement includes the possibility of securing a structured financing facility solution up to US$15m with them.
- Global equity markets have recently supported funding restarts for a number of mothballed uranium operations or final project studies including:
  - Paladin Energy Limited (ASX: PDN) raising A$200m in March 2022 for the restart of the Langer Heinrich mine in Namibia;
  - Boss Resources Limited (ASX:BOS) raising A$120m in March 2022 for the restart of the Honeymoon Mine in South Australia;
  - Ur-Energy Inc (TSX:URE) raising US$46M in February 2023 to supplement working capital for ramp-up at the Lost Creek Mine in Wyoming and for possible future acquisitions or other strategic transactions.
  - Whilst not a restart, Bannerman Energy Limited (ASX:BMN) also raised A$40.7m in March 2022 for a DFS, FEED and marketing and financing activities in relation to their Etango Project in Namibia.
- The Board and Management Team has extensive experience in the global uranium, and broader resources industry. They have previously played significant roles in project evaluation and development, including project financing.
- The Company has a successful track record of raising equity funds as and when required to further the Company's exploration efforts including the work conducted on the Samphire Project post-acquisition in late 2020. Alligator's most recent equity raising initiatives were in mid to late 2021 and early 2022 where a combined total of A$30M was raised from institutional investors, high net wealth individuals and the current Shareholder base.

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- The Company also has a proven ability to attract new capital as evidenced in the two share placements in 2021.

The final funding mix will however depend on general market and resources industry conditions, specific counterparty appetite and terms, and the Alligator Board's prevailing views on optimal funding mix and balance sheet configuration.

While the Alligator Board believes there a reasonable basis that funding will be available as required, there is no assurance that the requisite funding for the Samphire Project will be secured.

14.0 Conclusions and next steps

The updated Mineral Resource Estimate for the Blackbush deposit was released in early March 2023. This, along with the favourable leaching and IX recovery bench-scale test results from ANSTO announced in December 2022 have been incorporated into this Scoping Study, which is based upon the in-situ recovery mining (ISR) method with a 1 Mlbs pa U_3O_8 production target from the Blackbush deposit only (LOM Production Target of 10.0 Mlbs pa U_3O_8).

The proposed Project at Blackbush based on ISR production will encompass:

- Establishment of wellfields
- Reverse osmosis (RO) plant to reduce the salinity of groundwater prior to ISR mining – required for improved Ion Exchange (IX) loading
- ISR of uranium from wellfields
- IX recovery of uranium from leaching solution using high-capacity salt tolerant resins
- Precipitation, calcining (drying) and packing of Uranium Oxide Concentrate (UOC) into drums for transport from site and shipping from Port Adelaide.

The key highlights from the Scoping Study are:

- Simple, low impact mining technique which reduces both capital and operating costs, reduces environmental impact, and is easier to rehabilitate.
- Shallow depth of 60 to 80m to mineralised horizons, giving reduced well field drilling costs.
- Robust project economics with expansion potential from resource and exploration upside.
- Low initial capital cost estimate, despite inclusion of significant contingency and inflation.
- Globally competitive operating cost profile.
- Significant optimisation opportunities.
- Field Recovery Trial (FRT) for late 2023 to confirm parameters to be used in a full feasibility study.

Development Schedule

A significant number of steps will be required to advance the Samphire Project through to first production, including:

- Ongoing drilling to bring the Blackbush resource to principally the Measured category, and continued resource extension,
- Successful completion of a pilot FRT trial,

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- State and Federal Government approvals to obtain a Mining Lease, followed by approval of a Program for Environment Protection and Rehabilitation (PEPR) for the operation, *
- Initial conditional offtake agreements,
- Completion of a Feasibility study to a standard that satisfies potential lenders,
- Detailed design and procurement,
- Financing – leading to FID,
- Construction and commissioning, and
- Ongoing production

*The timing for securing all required approvals is estimated only, and based on similar ISR mining approvals in South Australia while recognising the extensive base line environmental work that has already been done at the Project, however also recognising that this will be the first uranium mine in this particular regional location.

A realistic estimate of the continued workstreams and time to advance the Project to possible construction and production is included in this Study. It is estimated that the earliest construction start would be in 2026, with initial commissioning production the following year.

Next Steps

Alligator is finalising documentation to be submitted to the Department for Energy and Mining in South Australia (DEM) for approval of a Retention Lease (RL) and a pilot Field Recovery Trial (FRT) trial at the Project, targeted for late 2023. This FRT will greatly assist in further de-risking technical aspects of the Project. Planning, design work and detailed costing of the FRT is underway, with long lead items identified.

The Company has enhanced its level of stakeholder engagement around the FRT and wishes to build an understanding of the very small footprint and low environmental impact that this pilot process will have. The FRT will provide important confirmatory technical, environmental and hydrogeological information, both for a future potential operation design, and to support key stakeholder information. The FRT will be fully rehabilitated once all information is gathered, and if a future operation does not proceed.

Ongoing engagement is planned with all stakeholders to obtain further understanding of their concerns, questions and issues around a potential future Project; take account of these and develop mutual solutions and outcomes in going forward. An important part of this is also developing an understanding within stakeholders of the benefits the potential Project will bring to the region, including; additional diversified business opportunities; local direct employment and training (already occurring); Company support for local community; mutually beneficial engagement with pastoralists related to our focussed rehabilitation and weed management work (already occurring); development of new and innovative techniques for operating the Project.

Continued drilling (underway in late February 2023) to complete groundwater monitoring wells for the FRT, and to target further extension of the Blackbush resource. The drilling will also bring the immediate resource envelopes around the three-trial single well rings to a Measured category to allow accurate determination of actual recoveries during the trial.

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Additional studies are to be undertaken ahead of a planned full feasibility assessment to consider power and water supply and alternates, logistics and equipment supply sources, product transport route plus management plan, and further environmental and amenity considerations.

A range of project optimisation opportunities will continue to be pursued, for example the potential for reducing the amount of pre-conditioning while ensuring adequate resin loading in the IX plant, and other alternates to this such as newly developed resins. The elution process (stripping of uranium from the IX resins) requires further testwork for optimisation of process and costs. In addition, ANSTO testwork indicated the possibility of low reagent consumption within the uranium leaching process where further cost-effective optimisation may be possible.

Creating a vision for the future - Investigate the opportunity for a near carbon-free energy project, including:

- Lower power consumption (as ISR method has no material movement, nor crushing and grinding of rock) may allow full use of renewable power with battery backup;
- Distance to Whyalla may allow all electric vehicles and light trucks to be used; and
- Recent advances in electric on-highway prime movers may support the low level of logistics and product transport needed.

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APPENDIX A - ABBREVIATIONS

Abbreviation	Description
/	per
ACE	Adelaide Control Engineering
AGE	Alligator Energy
AISC	All In Sustaining Capital
ASNO	Australia Safeguards and Non-proliferation Office
ANSTO	Australia's Nuclear Science and Technology Organisation
ASX	Australia Security Exchange
AUD/AU$	Australian Dollars
AusIMM	Australasian Institute of Mining and Metallurgy
BCM	Bulk cubic metre
BHP	BHP Group Ltd
BLS	Barren leach solution
BOE	Boss Resources
BV	Bed Volumes
CAPEX	Capital expenditure
CWF	Contaminated waste facility
DG	Dangerous Goods
DIDO	Drive in - Drive out
DN	Nominal diameter
e	equivalent
E&I	Electrical and Instrumentation
EPA	Environmental protection agency
FGOR	Fine grain organic
FLT	Field Leach Trial
FIFO	Fly in – Fly out
FS	Feasibility Study
GWS	Groundwater Science
HDPE	High-density polyethylene
HEPA	High efficiency particulate air filter
HV	Heavy Vehicle
Heathgate	Heathgate Resources Pty Ltd
IP	Intellectual property
ISL	In-situ leach
ISR	In-situ recovery
IX	Ion exchange
JORC	Joint Ore Reserves Committee
km	Kilometre
kV	Kilovolt
kW	Kilowatt
lb	Pounds
L	Litres
Ltd	Limited
LOM	Life of mine
LV	Light Vehicle
L_{WSR}	Litres of wet settled resin
m^3	Cubic meters
MEL	Mechanical Equipment List

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Abbreviation	Description
M & LB	Mass and liquor balance
MM AUD	Million Australian Dollars
MW	Megawatt
NF	Nano-filtration
OPEX	Operational Expenditure
ORP	Oxidation reduction potential
PDC	Process Design Criteria
PEPR	Program for Environment Protection and Rehabilitation
PFD	Process Flow Diagram
PLS	Pregnant Leach Solution
PPE	Personal Protective Equipment
ppm	Parts per million
pty	Propriety
PV	Pore Volume
RFP	Request for proposal
RO	Reverse Osmosis
ROM	Run of mine
SA	South Australia
SAPN	South Australian Power Network
SBA	Strong base anion
SMP	Structural, Mechanical & Piping
SUL	Samphire Uranium Limited
TBC	To be confirmed
TBE	Tender Bid Evaluation
U_3O_8	Uranium Oxide
UOC	Uranium oxide concentrate
USA	Uranium SA
WGA	Wallbridge Gilbert Aztec

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