

## Black Swan Restart Project Update

12 July 2022

### KEY POINTS

- Solid progress being made on Feasibility Study
- Combined underground high-grade and open pit disseminated Mineral Resources of **29.8Mt @ 0.69% Ni for 206kt nickel contained**
- Mineral Resource update and other developments underpin opportunity to study **utilising the maximum available plant capacity of 2.2Mtpa**
- Preliminary metallurgical testwork demonstrates amenability of concentrates produced from both serpentinite and talc carbonate ore types to pressure oxidation for refinery feed
- Internal preliminary economic assessment supports various restart options
- Continued strong interest from potential offtake parties and financiers for Black Swan restart
- Discussions continuing with Pure Battery Technologies on offtake for their proposed Kalgoorlie refinery
- Direct shipped ore option shows sub-optimal economics

**Poseidon Nickel (ASX: POS) (“Poseidon”, “the Company”)** is pleased to provide an update on the Black Swan “Fill the Mill” strategy and the Bankable Feasibility Study process.

Managing Director and CEO, Peter Harold, commented, *“Over the past three months the Company has achieved solid progress on the Black Swan Bankable Feasibility Study on its 1.1Mtpa base case restart scenario to produce a smelter grade concentrate.*

*The recently announced Black Swan Disseminated Mineral Resource update together with the previously announced high grade underground resources update means total resources are now just over 206kt contained nickel.*

*The mineral composition of the Black Swan disseminated resource is primarily serpentinite and talc-carbonate ore types, with varying levels of talc content. As the quantity and distribution of talc can impact the concentrate quality and nickel recovery, we have undertaken significant metallurgical testwork on the different ore types at Black Swan to determine the most suitable route to market for our nickel concentrate. Most importantly the testwork has demonstrated the amenability of concentrate produced from both serpentinite and talc carbonate ore types to pressure oxidation producing a mixed hydroxide precipitate for downstream processing predominantly into the growing battery market. This positive outcome supports Poseidon’s continuing discussions with Pure Battery Technologies on supplying feed to their proposed Kalgoorlie refinery/pCAM hub.*

*In order to fully understand the economics of the downstream production of a mixed hydroxide precipitate the Company has included studies on producing a rougher concentrate feed stock which could be delivered to a pressure oxidation plant or sold to other nickel plants in WA that utilise autoclave leaching technology. In*

addition, the Company is obtaining capex and opex estimates for a pressure oxidation plant which will assist us in our discussions with Pure Battery Technologies. Given the strong interest in nickel units from Black Swan and the buoyant nickel price outlook we have included a 2.2Mtpa throughput scenario in our feasibility studies which would fully utilise our current milling infrastructure.

Based on the Resource updates and metallurgical testwork, we recently completed an internal preliminary economic assessment of the several restart options and the results of that assessment confirms our commitment to completing the feasibility studies.

Given the nickel price outlook, the projected demand for either nickel concentrates or MHP/pCAM products and internal preliminary economic assessment of the various restart options, the optionality has placed the Company in a unique position.

Not only will the Company continue with the feasibility on the 1.1Mtpa base case restart scenario, we have now included a 2.2Mtpa throughput scenario in our feasibility studies. The later could unlock long term value from our large resource base by fully utilising the existing processing capacity to provide feedstocks into the rapidly growing mixed hydroxide/pCAM markets.”

## Mineral Resource Update Drives Optionality

Poseidon recently released a Black Swan Disseminated Mineral Resource Estimate (MRE) update totalling **28.9Mt @ 0.63% Ni for 181kt of nickel metal contained**, an uplift of approximately 10kt of nickel from the previous estimate. The table below summaries the total Mineral Resource Estimate at Black Swan.

**TABLE 1 - BLACK SWAN PROJECT MINERAL RESOURCE STATEMENT**

Nickel Sulphide Resource	Cut Off Grade	Mineral Resource Category								
		Measured & Indicated			Inferred			Total		
		Tonnage (kt)	Ni% Grade	Ni Metal (t)	Tonnage (kt)	Ni% Grade	Ni Metal (t)	Tonnage (kt)	Ni% Grade	Ni Metal (t)
<b>Black Swan</b>	0.4%	10 700	0.75	80 000	18 200	0.55	101 000	28 900	0.63	181 000
<b>Silver Swan</b>	1.0%	138	9.00	12 450	8	6.00	490	146	9.50	12 940
<b>Golden Swan</b>	1.0%	112	4.70	5 200	48	2.20	1050	160	3.90	6 250
<b>Silver Swan Tailings</b>	N/A	675	0.92	6,200	-	-	-	675	0.92	6,200
<b>TOTAL</b>		<b>11 625</b>	<b>0.89</b>	<b>103 850</b>	<b>18 256</b>	<b>0.56</b>	<b>102 540</b>	<b>29 881</b>	<b>0.69</b>	<b>206,390</b>

Notes:

1. Totals may not add due to rounding to appropriate reporting precision
2. For further information on Black Swan disseminated resource estimate, refer to Company announcement “More Nickel in Updated Black Swan Mineral Resource”, dated 4 July 2022
3. For further information on Silver Swan resource estimate, refer to Company announcement “Silver Swan Resource Update”, dated 27 April 2022
4. For further information on Golden Swan resource estimate, refer to Company announcement “Golden Swan Maiden Resource”, dated 27 October 2021
5. For further information on Silver Swan Tailings resource estimate, refer to Company announcement “Silver Swan Tailings – Maiden Resource Estimate” dated 15 September 2021

The updated Black Swan Disseminated (**BSD**) Mineral Resource has significantly improved the confidence in the nickel grade and distribution of the metallurgically important serpentinite and talc-carbonate hosted disseminated mineralisation immediately below the Black Swan open pit. Confirming the distribution of the ore types (and quantifying the talc content) is important to identify mining blocks that will be suitable to produce a smelter grade concentrate. The talc-carbonate ore is typically high in talc (MgO) content (and low in iron-sulphide content) to produce a favourable concentrate feed for conventional smelters.

Earlier in 2022 a laboratory pressure oxidation (**POX**) test was completed on a concentrate produced from a ~50:50 talc-carbonate/serpentine ore blend. The POX leach extraction results were excellent, demonstrating greater than 97% nickel and cobalt extraction to the leach solution after 120 minutes residence time in the laboratory autoclave, with greater than 90% extraction of both nickel and cobalt after only 30 minutes. This testwork demonstrates the amenability of concentrate produced from higher talc ore blends to POX and has the potential to significantly increase the volume of ore from the BSD resource that could be economically mined. Quantitative X-Ray Diffraction (**QXRD**) assessment to model the talc distribution within the BSD resource is ongoing and will provide information for mine planning to blend the ore types to produce a flotation concentrate for feed into a POX facility.

Concurrently within the GR Engineering Services (**GRES**) 1.1Mtpa process plant and infrastructure study, the Company has requested GRES to investigate increasing the throughput of the concentrator to 2.2Mtpa (nameplate) capacity and provide capex and opex estimates for the production of approximately 100ktpa of concentrate to feed into a POX circuit to produce mixed hydroxide precipitate (**MHP**). The POX study will assist the Company in its discussions with Pure Battery Technologies (**PBT**) in relation to the potential supply of concentrate to their proposed Kalgoorlie refinery hub which is the recipient of a \$120 million MMI grant from the Federal Government.

Preliminary economic assessments are internal Company milestones which provide the basis for management and the Board to make decisions to continue various workstreams and also approve selected works to progress the Fill the Mill strategy.

At the end of June 2022, the Company completed the second internal preliminary economic assessment which concluded there was rationale for the Company to consider varying throughput scenarios for the Black Swan restart. In addition, the potential to process concentrate produced from higher talc ore types through POX opens a path to market for these ore types. These scenarios are summarised below and are not mutually exclusive. The 1.1Mtpa option producing a smelter grade concentrate could be preceded by a larger 2.2Mtpa operation producing a rougher concentrate for POX/autoclave processing.

BLACK SWAN RESTART PROJECT OPTIONS		
1.1Mtpa Smelter Grade Concentrate		2.2Mtpa Rougher Concentrate
<ul style="list-style-type: none"> <li>• Potential to economically mine and process low talc (MgO) serpentinite material</li> <li>• Lower capital requirement and greater near-term mining production potential</li> </ul>	<p><b>Mining</b></p> <p><b>Concentrate Processing</b></p> <p><b>Logistics</b></p> <p><b>Downstream Processing</b></p> <p><b>End Customer</b></p> <p><b>ESG</b></p>	<ul style="list-style-type: none"> <li>• Potential to economically mine and process a larger portion of the Mineral Resource (to include the talc carbonate ore type)</li> <li>• Reduces reliance on high-grade underground ore sources and tailings</li> </ul>
<ul style="list-style-type: none"> <li>• Smelter grade concentrate production requiring suitable low talc (MgO) ore feed</li> <li>• Likely project life based on suitable ore feed: less than 5 years</li> </ul>		<ul style="list-style-type: none"> <li>• Higher talc ore types amenable to POX processing, significantly increasing mine inventory</li> <li>• Likely project life based on suitable ore feed: significantly more than 5 years</li> </ul>
<ul style="list-style-type: none"> <li>• Truck concentrate to Kambalda, rail to Esperance /Fremantle, ship to overseas smelter</li> <li>• Potentially higher carbon footprint than trucking to WA downstream processing location</li> </ul>		<ul style="list-style-type: none"> <li>• PBT: truck concentrate to Kalgoorlie – 55kms</li> <li>• Existing WA autoclave operation: truck concentrate less than 300kms</li> <li>• POX located at Black Swan, nil transport</li> </ul>
<ul style="list-style-type: none"> <li>• Smelter industry proven path to market</li> <li>• Payabilities increased in recent times for smelter grade (low MgO) concentrate</li> </ul>		<ul style="list-style-type: none"> <li>• Less established technologies compared to smelter path</li> <li>• Value add downstream MHP or pCAM product could attract higher payability</li> </ul>
<ul style="list-style-type: none"> <li>• Smelter grade concentrate produces Class 1 nickel needing further processing for battery applications</li> </ul>		<ul style="list-style-type: none"> <li>• Emerging markets supporting global decarbonisation initiatives (battery, EVs)</li> <li>• Strong interest received from EV and battery manufacturers for product offtake</li> </ul>
<ul style="list-style-type: none"> <li>• Both 1.1Mtpa and 2.2Mtpa scenarios likely to benefit from existing infrastructure, including:             <ul style="list-style-type: none"> <li>○ lower carbon emission grid power instead of diesel generation; and</li> <li>○ water from replenishing nearby existing open pit sources rather than bore fields</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Shorter concentrate product transport to PBT Kalgoorlie refinery expected to reduce carbon emissions per nickel unit</li> <li>• Downstream processing in a stable mining jurisdiction provides security of supply for customers</li> </ul>	


Further studies and testwork is required to support both the 1.1Mtpa and/or 2.2Mtpa operations. The Company remains open to all restart options available.




















### Moving Forward

The Company will continue with these studies and metallurgical testwork to progress the BFS to determine the restart option which presents the most viable economic outcome. The 1.1Mtpa BFS remains on track for completion at end of September 2022, with the 2.2Mtpa studies requiring further work beyond this date to achieve a bankable feasibility level of accuracy.

The following table summarises the completion status for key BFS workstreams.

**TABLE 2 – BLACK SWAN BFS COMPLETION STATUS**

Note: each shaded block of scale represents 25% completion of study workstream (i.e. 75% complete: )

BFS Workstream	Completion Status	Comment
Mineral Resource Estimate		<ul style="list-style-type: none"> <li>Black Swan resource drilling &amp; Mineral Resource Estimate</li> <li>Silver Swan resource drilling &amp; Mineral Resource Estimate</li> <li>Golden Swan resource drilling &amp; Maiden Mineral Resource Estimate</li> <li>Silver Swan tailings drilling and Maiden Resource Estimate</li> <li>Ongoing review of additional drilling requirements to increase indicated resource, particularly for 2.2Mtpa throughput</li> </ul>
Mine Planning for 1.1Mtpa operation		<ul style="list-style-type: none"> <li>Black Swan Serpentinite mine plan optimisation for 1.1Mtpa throughput</li> <li>Silver Swan Mine Planning</li> <li>Golden Swan Mine Planning</li> </ul>
Mine Planning for 2.2Mtpa operation		<ul style="list-style-type: none"> <li>Golden Swan and Silver Swan mine planning as per 1.1Mtpa throughput</li> <li>Black Swan Serpentinite and Talc Carbonate mine plan optimisations for 2.2Mtpa throughput</li> </ul>
BSD talc distribution		<ul style="list-style-type: none"> <li>Quantification of talc content and distribution (QXRD testing) ongoing</li> <li>QXRD results to be mapped into BSD Mineral Resource to assist mine planning and identify/confirm opportunity for ore blending</li> </ul>
Underground rehabilitation works		<ul style="list-style-type: none"> <li>Ladderway refurbishment completed, ongoing maintenance</li> <li>Silver Swan decline rehabilitation project largely completed</li> </ul>
Mine waste dump and tailings design		<ul style="list-style-type: none"> <li>Integrated Waste Rock Landform (IWRL) design nearing completion</li> </ul>
Silver Swan tailings		<ul style="list-style-type: none"> <li>Silver Swan tailings reclamation report issued</li> </ul>
GRES 1.1Mtpa engineering Study		<ul style="list-style-type: none"> <li>Mechanical Equipment Lists completed</li> <li>Design criteria and mass balances completed</li> <li>Capital and operating cost RFQ process ongoing</li> </ul>
GRES 2.2Mtpa engineering Study		<ul style="list-style-type: none"> <li>As per 1.1Mtpa engineering study</li> </ul>
GRES POX engineering study		<ul style="list-style-type: none"> <li>Scoping level POX engineering study underway</li> </ul>
Power supply		<ul style="list-style-type: none"> <li>Load studies progressing with Western Power to access 18MVA from grid</li> </ul>
Water supply		<ul style="list-style-type: none"> <li>Formal agreement executed to access up to 3,600m<sup>3</sup> of groundwater per day from existing open pits proximal to Black Swan</li> </ul>
Non-processing infrastructure		<ul style="list-style-type: none"> <li>Investigating workforce accommodation options</li> </ul>
Concentrate transport		<ul style="list-style-type: none"> <li>Concentrate logistics options study</li> </ul>
Permits / regulatory approvals		<ul style="list-style-type: none"> <li>Current permits suitable for start-up, amendments required for Silver Swan tailings and larger waste and tailings facilities for 2.2Mtpa throughput</li> </ul>
Community engagement		<ul style="list-style-type: none"> <li>Preliminary discussions held with traditional owners are progressing</li> </ul>
ESG & sustainability		<ul style="list-style-type: none"> <li>ESG framework developed</li> <li>ESG audit to be completed following finalisation of mining and engineering studies</li> </ul>
Offtake		<ul style="list-style-type: none"> <li>Significant number of approaches from potential offtake partners</li> <li>Mine production schedules to be finalised</li> </ul>
Funding		<ul style="list-style-type: none"> <li>Approaches received from parties interested in offtake and funding arrangements</li> </ul>

## Other

### High-grade Direct Ship Ore (DSO) Evaluation Completed

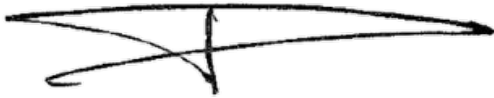
Following the Silver Swan Resource update released during April 2022, the Company completed its review of a potential DSO project mining the high-grade underground resource at Black Swan and shipping it to a third-party mill for processing.

Inflationary pressures over recent years have increased underground mining costs by over 30% compared to the 2018 Black Swan feasibility study. The higher mining costs together with indicative offtake terms provided and the capital required for development of the high-grade resource for a relatively small amount of contained nickel resulted in a sub-optimal economic outcome compared to processing the high-grade ore through the Black Swan concentrator. Therefore, the Company has ceased further studies on a DSO operation at Black Swan and is fully focused on the 1.1Mtpa and 2.2Mtpa studies.

### Pure Battery Technologies (PBT)

The Company continues discussions with PBT to supply concentrate from Black Swan as a base load feed for their proposed Kalgoorlie pCAM refinery project. As noted in this announcement the potential uplift in throughput for the Black Swan project to 2.2Mtpa further supports the feed requirements for the pCAM project. In addition, downstream processing through a POX / MHP facility provides a path to an expanding battery market and opens up inclusion of the talc -carbonate ore type into the production profile, which is not suitable for the smelter market.

*This announcement was authorised for lodgement by the Board of Poseidon Nickel Limited.*



**Peter Harold**  
**Managing Director & CEO**

**12 July 2022**

### COMPETENT PERSON STATEMENTS:

*"The information contained within this announcement is extracted from the reports titled:*

- *"More Nickel in Updated Black Swan Mineral Resource" released 4 July 2022*
- *"Silver Swan Resource Update" released 27 April 2022*
- *"Silver Swan Tailings – Maiden Resource Estimate" released 15 September 2021*
- *"Golden Swan Maiden Resource" released 27 October 2021*

*which are available to view on [www.poseidon-nickel.com.au](http://www.poseidon-nickel.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original announcement and, in the case of Minerals Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not materially modified from the original market announcement."*

*The information in this report that relates to Exploration Targeting and Results is based on, and fairly represents, information compiled and reviewed by Mr Andrew Pearce, who is an employee of Poseidon Nickel, and is a Member of The Australian Institute of Geoscientists.*

*Mr Pearce has sufficient experience which is relevant to the style of mineralisation and type of deposits under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (the JORC Code 2012). Mr Pearce consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*

*The Australian Securities Exchange has not reviewed and does not accept responsibility for the accuracy or adequacy of this release.*

### FORWARD LOOKING STATEMENTS:

*This release contains certain forward looking statements including nickel production targets. Often, but not always, forward looking statements can generally be identified by the use of forward looking words such as "may", "will", "except", "intend", "plan", "estimate", "anticipate", "continue", and "guidance", or other similar words and may include, without limitation, statements regarding plans, strategies and objectives of management, anticipated production and expected costs. Indications of, and guidance on future earnings, cash flows, costs, financial position and performance are also forward looking statements.*

*Forward looking statements, opinions and estimates included in this announcement are based on assumptions and contingencies which are subject to change, without notice, as are statements about market and industry trends, which are based on interpretation of current market conditions. Forward looking statements are provided as a general guide only and should not be relied on as a guarantee of future performance.*

*Forward looking statements may be affected by a range of variables that could cause actual results or trends to differ materially. These variations, if materially adverse, may affect the timing or the feasibility and potential development of the Golden Swan underground mine.*

## About Poseidon Nickel Limited

*Poseidon Nickel Limited (ASX Code: POS) is a nickel sulphide exploration and development company with three projects located within a radius of 300km from Kalgoorlie in the Goldfields region of Western Australia and a resource base of around 400,000 tonnes of nickel and 180,000 ounces of gold.*

*Poseidon's strategy is focused on the exploration and eventual restart of its established nickel operations in Western Australia. A critical element of this strategy has been to acquire projects and operations with significant existing infrastructure, large nickel resources and geological prospectivity likely to lead to resource growth through the application of modern exploration techniques.*

*Poseidon owns the Windarra, Black Swan and the Lake Johnston Nickel Projects. In addition to the mines and infrastructure including concentrators at Black Swan and Lake Johnston, these projects have significant exploration opportunities demonstrated by the discovery of the Golden Swan Resource at Black Swan and the Abi Rose mineralisation at Lake Johnston.*

*Black Swan will be the first project to restart followed by Lake Johnston and then Windarra, subject to favourable Feasibility Studies, appropriate project financing structures being achieved, the outlook for the nickel price remaining positive and all necessary approvals being obtained.*

*The Company completed a Definitive Feasibility Study on retreating the gold tailings at Windarra and Lancefield in July 2021 and is currently investigating potential partners to develop the project and monetise the asset.*

## Appendix 1 - Mineral Resource Statement

**TABLE 1: NICKEL PROJECTS MINERAL RESOURCES STATEMENT (4 JULY 2022)**

Nickel Sulphide Resources	JORC Compliance	Cut Off Grade	MINERAL RESOURCE CATEGORY															
			MEASURED			INDICATED			INFERRED			TOTAL						
			Tonnes (Kt)	Ni% Grade	Ni Metal (t)	Tonnes (Kt)	Ni% Grade	Ni Metal (t)	Tonnes (Kt)	Ni% Grade	Ni Metal (t)	Tonnes (Kt)	Ni% Grade	Ni Metal (t)	Co% Grade	Co Metal (t)	Cu% Grade	Cu Metal (t)
<b>BLACK SWAN PROJECT</b>																		
Black Swan	2012	0.4%	800	0.76	6,000	9,900	0.75	74,000	18,200	0.62	101,000	28,900	0.63	181,000	0.01	4,500	0.02	5,800
Silver Swan	2012	4.5%				138	9.00	12,450	8	6.00	490	146	9.50	12,940	0.16	240	NA	-
Golden Swan	2012	1.0%				112	4.70	5,200	48	2.20	1,050	160	3.90	6,250	0.08	120	0.30	480
Silver Swan Tailings	2012	NA	675	0.92	6,200							675	0.92	6,200	0.07	450	0.04	250
<b>LAKE JOHNSTON PROJECT</b>																		
Maggie Hays	2012	0.8%				2,600	1.60	41,900	900	1.17	10,100	3,500	1.49	52,000	0.05	1,800	0.10	3,400
<b>WINDARRA PROJECT</b>																		
Mt Windarra	2012	0.9%				922	1.56	14,000	3,436	1.66	57,500	4,358	1.64	71,500	0.03	1,200	0.13	5,700
South Windarra	2004	0.8%				772	0.98	8,000				772	0.98	8,000	NA	-	NA	-
Cerberus	2004	0.75%				2,773	1.25	35,000	1,778	1.91	34,000	4,551	1.51	69,000	NA	-	0.08	3,600
<b>TOTAL</b>																		
Total Ni, Co, Cu Resources	2004 & 2012		1,475	0.83	12,200	17,217	1.11	190,550	24,370	0.84	204,140	43,062	0.94	406,890	0.02	8,310	0.04	19,230

Note: totals may not sum exactly due to rounding. NA = Information Not Available from reported resource model.

- **Black Swan Resource** as at 4 July 2022 (see ASX announcement "More Nickel in Updated Black Swan Mineral Resource" released 4 July 2022)
- **Silver Swan Resource** as at 27 April 2022 (see ASX announcement "Updated Silver Swan Resource underpins significant increase in high-grade Indicated resource base" released 27 April 2022)
- **Golden Swan Resources** as at 27 October 2021 (see ASX announcement "Golden Swan Maiden Resource" released 27 October 2021).
- **Silver Swan Tailings Resource** as at 15 September 2021 (see ASX announcement "Silver Swan Tailings – Maiden Resource Estimate" released 15 September 2021)
- **Maggie Hays Resource** as at 17 March 2015 (see ASC announcement "50% Increase in Indicated Resources at Lake Johnston" released 17 March 2015)
- **Mt Windarra Resource** as at 7 November 2014 (see ASX announcement "Poseidon Announces Revised Mt Windarra Resource" released 7 November 2014)
- **South Windarra and Cerberus Resource** as at 30 April 2013 (see ASX announcement "Resource Increase of 25% at Windarra Nickel Project" released 1 December 2011)

The Company is not aware of any new information or data that materially affects the information in the relevant market announcements. All material assumptions and technical parameters underpinning the estimates in the relevant market announcements continue to apply and have not materially changed.