ASX ANNOUNCEMENT

NOLANS PROJECT UPDATE

11 May 2021

- **Feasibility study update confirms Nolans' ultra-low operating costs of US$24.76/kg NdPr oxide**
- **Robust financial metrics with NPV of $1.4 billion, IRR of 18.1% and average EBITDA of A$354m per annum based on a LOM of 38 years**
- **Targeting commencement of Front-End Engineering and Design mid-2021**
- **Feasibility study update to provide the basis for securing finance through export credit agencies and other sources**

Arafura Resources Limited (ASX:ARU) ("**Arafura**" or the "**Company**") is pleased to report on the completion of the feasibility study update for its 100%-owned Nolans Neodymium-Praseodymium (NdPr) Project in the Northern Territory.

The recent strength in rare earths prices and increasing interest from financiers and potential offtake partners, along with project changes determined through optimisation work, provided strong rationale for Arafura to review the findings of the Nolans definitive feasibility study (DFS) delivered in February 2019.

Elements of the project that have been refined or optimised since then include the process flowsheet (following completion of final stages of pilot program); process plant design (deferral of cerium production and minor increase in concentrate processing capacity); and mine scheduling (factoring in Ore Reserve update announced March 2020).

The updated cost estimates and financial outcomes reported in this announcement will now form the basis of discussions to finalise funding for Nolans, with Arafura targeting a Final Investment Decision in August 2022. Ahead of this – and in keeping with the revised execution strategy articulated recently – Front-End Engineering and Design (FEED) activities are expected to begin next quarter.

Following the feasibility study update, key project information and financial metrics for Nolans are as follows:

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Key Project Information		
Mining and Production		
Mine Life (years)	38	
NdPr Oxide (tpa)	4,440	
SEG/HRE Oxide (tpa)	474	
Phosphoric Acid (tpa 54% P_2O_5 MGA)	144,393	
Financial	**US$**	**A$**
Capital Cost ($m)	768	1,056
Rare Earth Sales Revenue ($m/annum)	388	534
Phosphoric Acid Sales Revenue ($m/annum)	58	79
Mining Costs ($m/annum)	(30)	(42)
Processing Costs ($m/annum)	(105)	(145)
General and Administration Costs ($m/annum)	(15)	(21)
EBITDA ($m/annum)	257	354
KPI Analysis	**US$**	**A$**
Operating Cost $/kg NdPr	33.91	46.60
Operating Cost $/kg NdPr net of P_2O_5 credit	24.76	34.06
NPV_8 after tax ($m)	1,011	1,402
IRR after tax (%)	18.1%	

Note: Numbers may not compute because of rounding. Average revenue, costs and EBITDA are calculated as the arithmetic annual average following the anticipated two year ramp up period and excluding the final years of production from low grade stockpiles.

Arafura Managing Director Gavin Lockyer said: *"The feasibility study update confirms Nolans as a shovel-ready world-class NdPr rare earths project with ultra-low operating costs and the capacity to deliver robust financial returns over an initial mine life nearing 40 years and it will provide an important tool with which to progress discussions on financing and offtake towards a successful close. Following the non-binding letter of support from Export Finance Australia for a A$200m facility, we are working towards securing binding senior debt terms in line with the target for a Final Investment Decision in the second half of 2022."*

"The size of the Nolans deposit will provide our customers security of supply for their critical raw materials and our "Ore to Oxide" at a single site provides provenance that their product is being derived from processes aligned with their ESG priorities."

"With the forecast demand growth for NdFeB magnets to support the manufacture of electric vehicles amongst other applications, the rising imperative for nations to shore up sustainable supply chains and the lack of alternative NdPr sources outside of China, Arafura is moving ahead with greater confidence than ever before."

Further detail on the feasibility study update is included at the back of this announcement.

-ENDS

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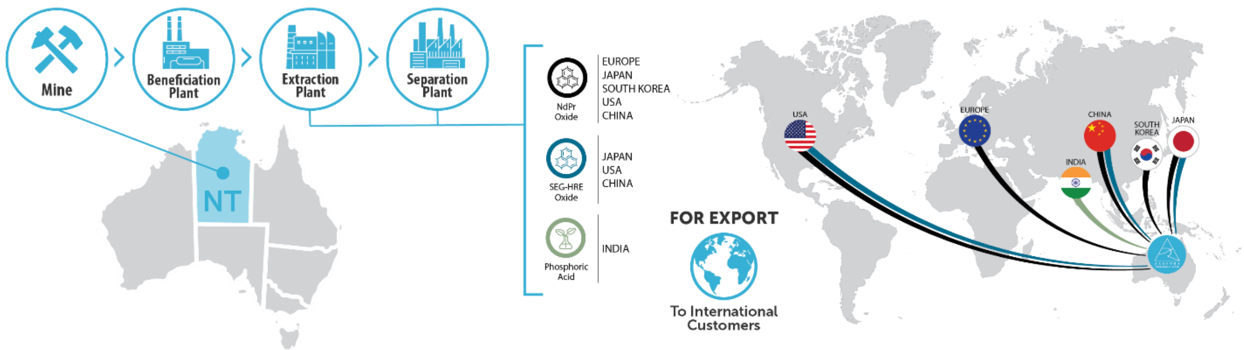
PROJECT SCOPE

The Nolans Project will encompass a mine, process plant (comprising beneficiation, extraction and separation plants) and related infrastructure to be constructed and located at the Nolans site, 135 kilometres north of Alice Springs in Australia's Northern Territory. The Project is underpinned by low-risk Mineral Resources that have the potential to supply a significant proportion of the world's NdPr demand. It is a globally significant and strategic NdPr project which, once developed, will become a major supplier of these critical minerals to the high-performance NdFeB permanent magnet market.

The Project will benefit from its Australian domicile and its proximity to transport, water and energy infrastructure.

Figure 1: Offtake Strategy



ENVIRONMENT

The Nolans Project has been subject to Northern Territory and Australian environmental assessment processes administered by the Northern Territory Environment Protection Authority (**NT EPA**) and the Australian Government Department of the Environment and Energy (**DoEE**). The Company received environmental approval from the NT EPA in 2017 *(refer to ASX announcement 5 January 2018)* and from the DoEE in 2018 *(refer to ASX announcement 14 May 2018)*. These rigorous and lengthy processes included an assessment of the Company's ability to manage mine waste and process plant residues and to progressively rehabilitate the site. This has been fully costed into the Project Update.

Nolans is the only NdPr-focused project in Australia that has secured complete environmental permitting for mining, beneficiation, extraction and separation of rare earths, including the on-site management and disposal of attendant radioactive tailings and process wastes, as well as progressive site rehabilitation.

COMMUNITY AND SOCIAL BENEFITS

The Project is expected to deliver substantial social and economic benefits to local, regional and national stakeholders. This will include indigenous and local employment opportunities, small and medium enterprise business opportunities, royalties and potentially shared infrastructure. The Company estimates the peak construction workforce will be 650 people with a steady state operating workforce of 280. During steady state operations, most of the workforce will reside at site. However, the Project has the potential to accommodate community friendly rosters considering its proximity to the communities of Alice Springs, Ti Tree and Laramba.

In recognition of the Project's national strategic significance the Australian Government renewed its Major Project Status in 2020 *(refer to ASX announcement 31 July 2020)*. Major Project status provides a mechanism for coordinated access to a range of Australian Government services and programs which will assist in both the Project development as well as delivering benefits for local and regional stakeholders.

MINING LICENCE AND PERMITTING

Australia's mining and mineral processing industry is both mature and well-regulated having been developed over many decades under the stewardship of successive state and federal governments.

A Native Title Agreement (**NTA**) covering all parts of the Nolans Project has been executed with the site's Native Title Holders *(refer to ASX announcement 26 June 2020)*. This NTA provides for the on-going protection of the Native Title Holders rights as well as allowing them to share in the long-term benefits of the Nolans Project.

Following the execution of the NTA the Northern Territory Government has granted the Project's Mineral Leases (**MLs**) *(refer to ASX announcements 22 July 2020 and 9 February 2021)* which provide Arafura tenure over the Nolans asset for 25 years and a licence to operate (subject to annual compliance reviews) for the same period.

FEASIBILITY STUDY UPDATE

The Nolans Project definitive feasibility study (**DFS**) was delivered in early 2019 (*refer to ASX announcement 7 February 2019*) demonstrating that Nolans is a world-class NdPr rare earths project which has the capacity to deliver robust economic outcomes at ultra-low unit operating costs over a life of mine (**LOM**) of 23 years. Following this, further work on the processing of certain geological material types which, along with additional mine optimisation, design and mine scheduling, the Ore Reserves were updated (*refer to ASX announcement 16 March 2020*). These updated Ore Reserves support a 33-year production life based on Ore Reserves only or a 39-year life based on the mining inventory. To optimise the Project production profile and economic outcomes, the updated mine scheduling also included an associated minor increase in concentrate processing capacity in the proposed processing plant design over the DFS.

In addition, since the release of the DFS, Arafura has completed the final phases of an extensive 4-year metallurgical pilot program and finalised the assessment and analysis of the results of this program *(refer to ASX announcement 21 January 2021)*. The completion of this metallurgical pilot program resulted in several process flowsheet modifications to incorporate the results of the testing and also to optimise the metallurgical performance of the circuit. The changes included the deferral of cerium production *(refer to ASX announcement 21 April 2021)* to allow for the focus on the ramp-up of on-specification high value NdPr production and to offset the risk of downward pressure on cerium price.

Based on these changes, along with the intervening two-years since the release of the DFS, recent increases in rare earth prices and Arafura's traction with Project financing and offtake it was decided to update the cost estimates and financial outcomes for the Project to provide an up-to-date basis for the finalisation of financing and commencement of front-end engineering and design (**FEED**).

The feasibility study update has been completed primarily by Arafura's integrated project management team (**IPMT**) which consists of KBR, Wave International and Arafura's geological, metallurgical and project personnel (*refer to ASX announcement 23 January 2020)*. The IPMT was assisted by the following consultants for aspects of the feasibility study update:

- Mining Plus Pty Ltd – Mine planning, design and scheduling along with mining cost estimation.
- Simulus Pty Ltd – Process simulation.

- Infinity Corporate Finance – Financial modelling.

In addition, advice and input was sought from a range of the consultants used in the DFS to provide input into the updating of the design and costs. All material assumptions, unless otherwise noted in this report, are based on the assumptions reported either in the DFS (*refer ASX announcement 7 February 2019*) or the Updated Mining Study (*refer ASX announcement 16 March 2020*) and the Company confirms that these unaltered material assumptions continue to apply and have not changed.

Geology and Mineral Resources

The feasibility study update is based on the Mineral Resources for the Nolans Bore deposit (*refer to ASX announcement 7 June 2017*) which is unchanged from the Mineral Resources used in the DFS. The Company confirms that it is not aware of any new information or data that materially affects the information included in this previous announcement of Mineral Resources and that all material assumptions and technical parameters underpinning this estimate continue to apply and have not materially changed. The Company is in the process of reviewing the geological model in preparation for detailed mine planning activities which will incorporate the results of the small 2019 drilling program (*see ASX announcement 17 December 2019*) and a review of the logging of the host rocks. The Company confirms that this additional work should lead to an increase in Mineral Resources, but is not expected to materially change the Mineral Resource estimate for the Project.

These resources are classified according to the 2012 JORC Code guidelines and shown in the Table 1.

Table 1: Nolans Bore Deposit Mineral Resources

Statement of Mineral Resources for the Nolans Bore Rare Earth Deposit Announced 7 June 2017 – 1% TREO lower cut-off grade				
Category	**Tonnes (Mt)**	**TREO (%)**	**P_2O_5 (%)**	**NdPr Enrichment (%)**
Measured	4.9	3.2	13	26.1
Indicated	30	2.7	12	26.4
Inferred	21	2.3	10	26.5
Total	**56**	**2.6**	**11**	**26.4**

Note: Numbers may not compute due to rounding. "NdPr Enrichment" is the proportion of TREO comprising neodymium oxide Nd_2O_3 and praseodymium oxide Pr_6O_{11}.

The stated TREO grade is based on the sum of the estimated grades for La_2O_3, CeO_2, Pr_6O_{11}, Nd_2O_3, Sm_2O_3, Eu_2O_3, Gd_2O_3, Tb_4O_7, Dy_2O_3, Ho_2O_3, Er_2O_3, Tm_2O_3, Yb_2O_3, Lu_2O_3 and Y_2O_3.

The Mineral Resources were further classified by geometallurgical material types based on logging and analysis. Details of the material classification are contained in the DFS.

Mining and Ore Reserves

The pit optimisations, mine designs, Ore Reserves and mining inventory are unchanged from the Updated Mining Study (*refer to ASX announcement 16 March 2020*). The Company confirms that it is not aware of any new information or data that materially affects the information included in this previous announcement of Ore Reserves and that all material assumptions and technical parameters underpinning this estimate continue to apply and have not materially changed.

The Ore Reserves are classified according to the 2012 JORC Code guidelines and shown in the Table 2.

Table 2: Nolans Project Ore Reserves

Nolans Project Ore Reserves Announced 16 March 2020				
Classification	**Tonnes (Mt)**	**TREO (%)**	**P_2O_5 (%)**	**NdPr Enrichment (%)**
Proved	5.0	3.0	13	26.2
Probable	24.6	2.8	13	26.5
Total	**29.5**	**2.9**	**13**	**26.4**

Note: Numbers may not compute due to rounding. "NdPr Enrichment" is the proportion of TREO comprising neodymium oxide Nd_2O_3 and praseodymium oxide Pr_6O_{11}.

The Ore Reserves include mining factors of 5% for ore-loss and 15% for dilution which leads to the marginal increase in Proved Reserves from Measured Resources.

Pit designs were undertaken using Surpac software, allowances were made for the recommended pit wall angles, and pit ramps suitable for the selected mining equipment were incorporated. As the final pit designs were derived, Inferred Resources were included within the mining inventory. This material is excluded from the Ore Reserves and from mill feed in the Ore Reserves only production schedule for reporting purposes.

The Project, and the pit designs developed by Mining Plus, do not rely on the inclusion of Inferred Mineral Resources as mill feed in order to be feasible.

Production Scheduling

For the feasibility study update, further work on the mine scheduling was undertaken to optimise the production schedule and Project financial outcomes. Schedules were developed for both the mining inventory and the Ore Reserves only and incorporated the following changes from the DFS and Updated Mining Study:

- Minor increase in the concentrate processing capacity of the process plant from 330,000 tpa to 340,000 tpa (DFS was based on 300,000 tpa).
- Increase in beneficiation capacity from 1 Mtpa to 1.5 Mtpa later in the LOM to accommodate lower ROM head grades.
- Minor changes to the hydrometallurgical recovery of rare earths and P_2O_5 resulting from the changes to the processing plant design.

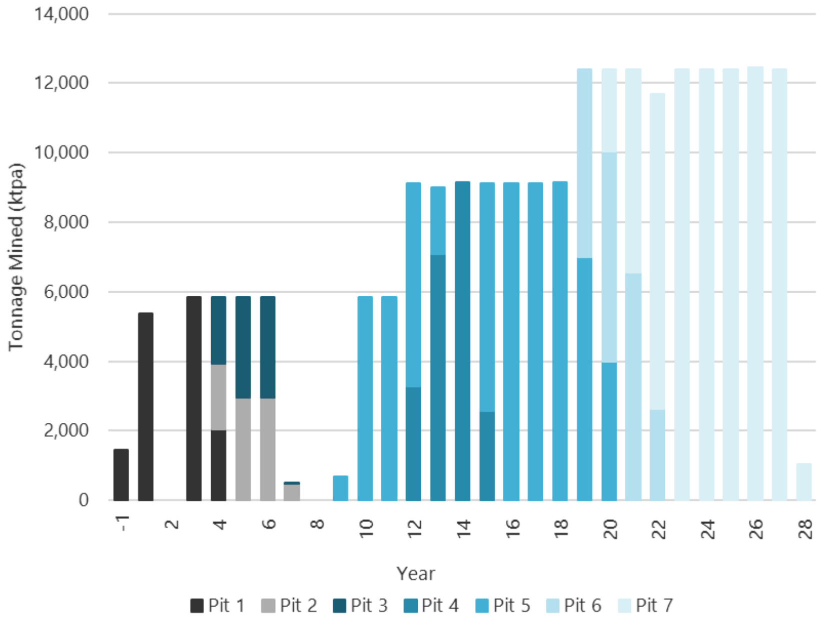
The scheduling was carried out in the same manner and using the same constraints, unless otherwise noted, and techniques as those used in the Updated Mining Study (*refer to ASX announcement 16 March 2020*).

Mining Inventory Production Schedule

The mining inventory production schedule results in a LOM of 38 years consisting of a two-year ramp period and a five-year period of processing stockpiled material off low-grade stockpiles at the end of the LOM.

Mining is completed over 28 years with two up-front mining campaigns prior to commencing full-time mining in year nine (Figure 2).

Figure 2: Mining Inventory Mining Schedule

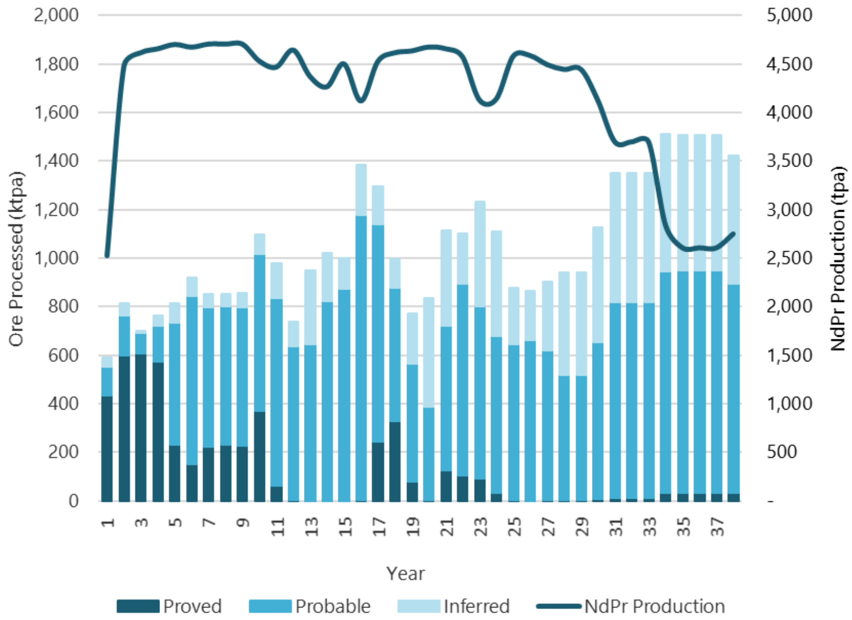


Processing tonnages, including the breakdown between Proved Ore Reserves, Probable Ore Reserves and Inferred Mineral Resources, over the 38-year LOM, with increase in the maximum processing rate in year 16 to accommodate lower head grades are shown in Figure 3. The overall proportions of Proved Ore Reserves, Probable Ore Reserves and Inferred Mineral Resources are 12%, 62% and 26% respectively and it can be seen in Figure 3 the processing of Inferred Mineral Resources occurs predominately in the later stages of the LOM.

There is a low level of geological confidence associated with Inferred Mineral Resources 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.

Scheduling of the production results in an average NdPr oxide production of 4,440 tpa (Figure 3). The average production excludes the two year ramp up period and the final five years of processing low grade material off long term stockpiles.

Figure 3: Mining Inventory Production Schedule

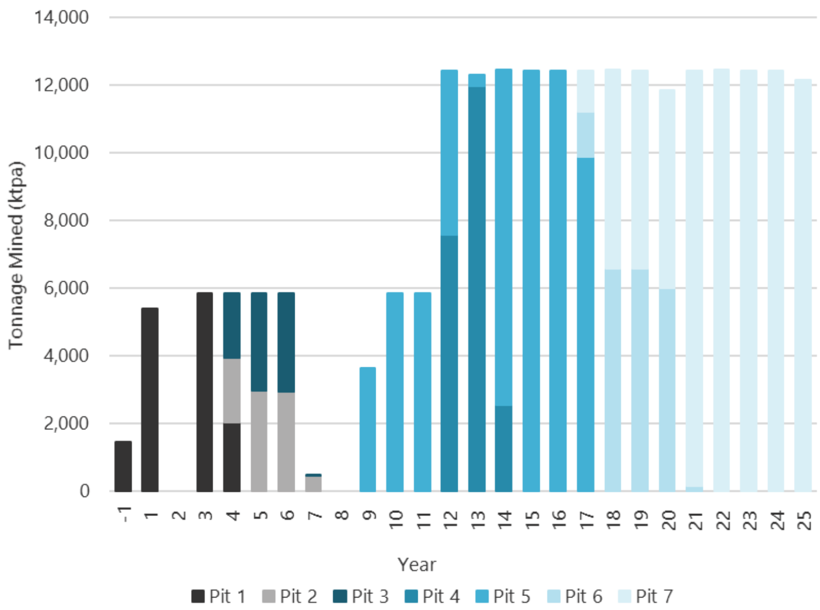


Ore Reserves Only Production Schedule

The Ore Reserves only production schedule, prepared to demonstrate the viability of the Project without inclusion of Inferred Mineral Resources, results in a LOM of slightly over 29 years consisting of a two-year ramp period and a slightly over two-year period of processing stockpiled material off low-grade stockpiles at the end of the LOM.

Mining is completed over 25 years with two up-front mining campaigns prior to commencing full-time mining in year nine (Figure 4).

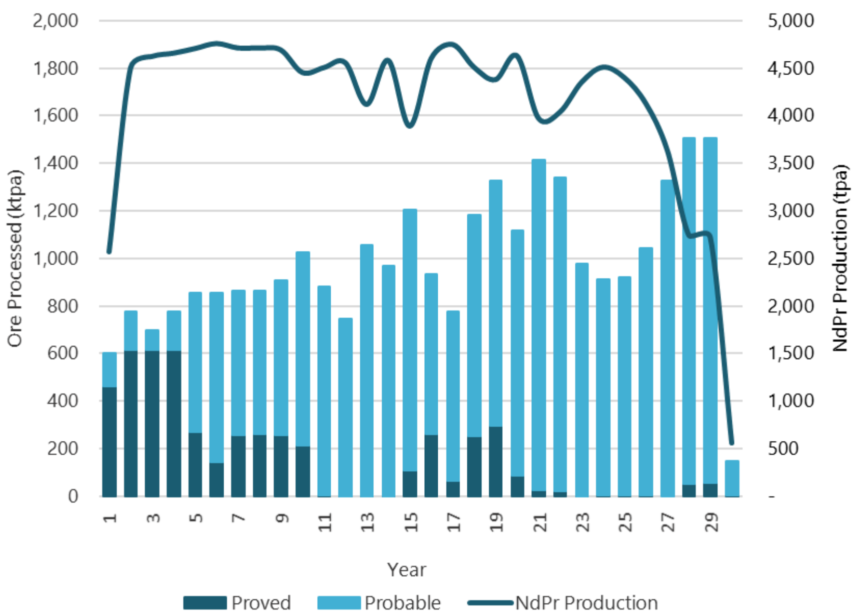
Figure 4: Ore Reserves Only Mining Schedule



Processing tonnages, including the breakdown between Proved and Probable Ore Reserves, over the 29-year LOM is shown in Figure 5, with increase in the maximum processing rate in year 15 to accommodate lower head grades.

Scheduling of the production results in an unchanged average NdPr oxide production from the Mining Inventory (Figure 5). The average production excludes the two year ramp up period and the slightly over two years of processing low grade material off long term stockpiles.

Figure 5: Ore Reserves Only Production Schedule



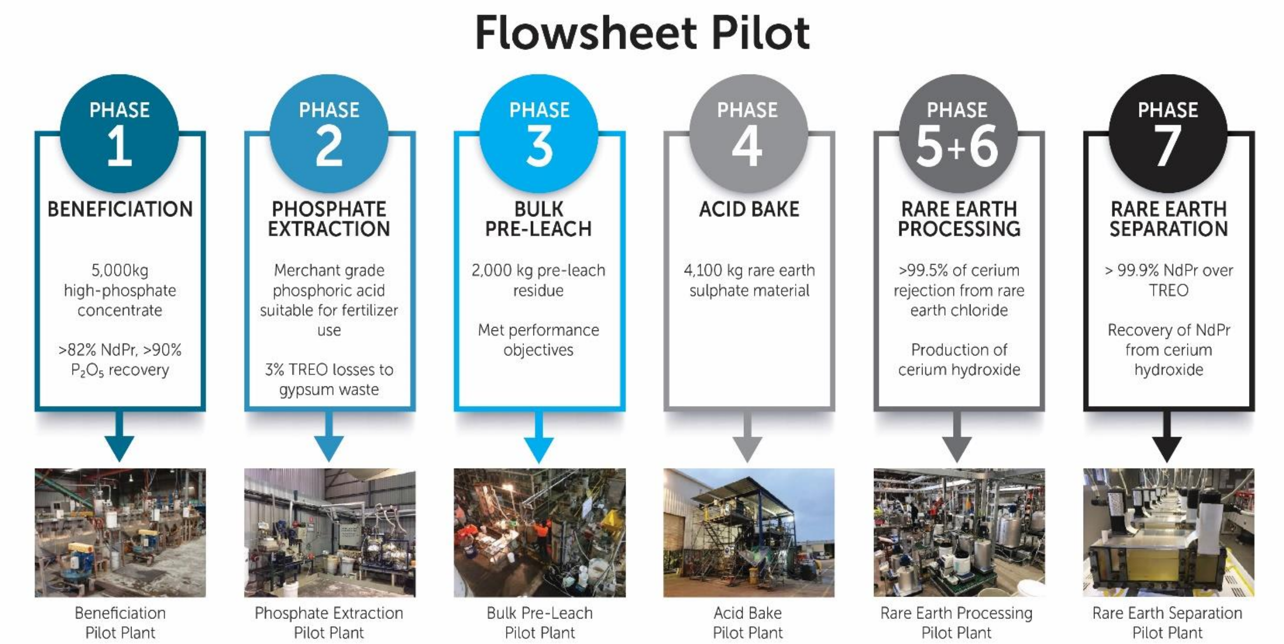
Metallurgy and Process Plant

Since the completion of the DFS, the Company has continued its extensive technology program aimed at further de-risking of the Project through better definition and understanding of the required operating and design parameters and also through the effective incorporation of risk management measures throughout the design.

Metallurgical Test Work and Process Selection

The metallurgical pilot program, shown in Figure 6, for the Nolans project has been carried out over four years in seven separate phases.

Figure 6: Metallurgical Pilot Program Phases



Phases 1 through to 3 of this metallurgical pilot program, which commenced with 15 tonnes of material, were completed with results provided prior to the commencement of the DFS in early 2018, with Phases 4 through to 6 carried out during the completion of the DFS through 2018. Phase 7 consisted of four stages with the SEG/HRE separation completed in December 2019, NdPr separation completed in January 2020 (*refer ASX announcement 20 February* 2020), cerium processing completed in February 2020 and product precipitation completed in June 2020. The metallurgical pilot program culminated in the production of on-specification rare earth products which have been validated by supply chain partners and potential customers (*refer ASX announcement 18 September 2020*). Other minor test work programs on ancillary circuits, such as phosphoric acid purification, were also undertaken in 2019 and 2020.

The final analysis of the results from the later stages of the pilot program was completed during 2020 with these results incorporated into the process flowsheet progressively. The updated process flowsheet is presented in Figure 8, with the key changes to the process including:

- Reduction in the operational risk in the rare earth hydroxide dissolution circuit – An additional stage of leaching and heat treatment has been added to improve filtration and washing performance in the cerium removal circuit prior to the separation plant.

- Improvement in NdPr recovery – a cerium hydroxide leaching and solvent extraction circuit has been included to recover NdPr from the cerium hydroxide and enable the production of a high purity cerium oxide product if desired.
- Change to nano-filtration from ion-exchange for rejection of impurities in the phosphoric acid product. This change provides added assurance for production of on-specification phosphoric acid, a key by-product, as well as removing impurities from the recycled phosphoric acid recycled to the pre-leach circuit which improves leaching efficiency and reduces the mass of material feeding the acid bake.
- Changes to various filtration equipment across the rare earth processing section of the hydrometallurgical circuits from plate and frame filters to candle filters following the evaluation of the results of the pilot testing. Candle filters were better suited to the nature of the process materials and the risks associated with challenging filtration duties.
- Minor changes to the separation solvent extraction circuits to achieve the required separation efficiencies.
- Increased confidence of final product purity by changing reagents for precipitation of final rare earth products.

As well as updating the process flowsheet, the process mass and energy balance has been updated to provide updated equipment sizing, energy, steam and reagent requirements. The final process flowsheet, mass and energy balance, and design criteria will form the metallurgical basis of design, which will be the starting point for the upcoming FEED program.

Processing

In addition to the changes to the process flowsheet described above, the design of the processing plant, while largely the same as that presented in the DFS, has also been updated to incorporate the following changes:

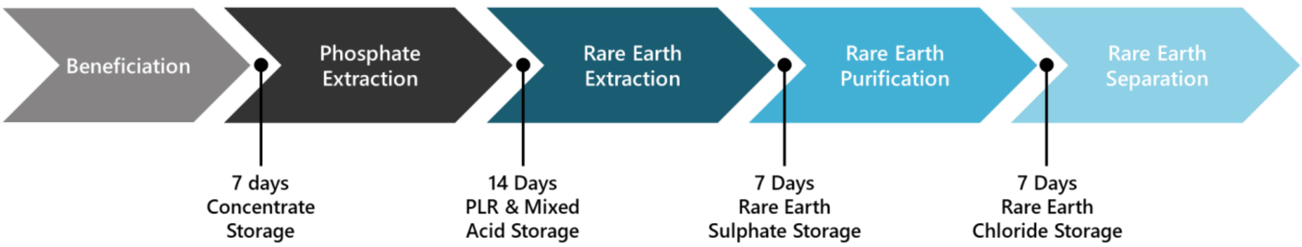
- Increased concentrate processing capacity required to optimise the production schedule and financial outcomes of the Project.
- Throughput changes in various circuits caused by the inclusion of the nano-filtration circuit for phosphoric acid purification and the cerium hydroxide processing circuit.
- Removal of the final cerium precipitation and product handling circuits, although the design includes the allowance for the later easy installation of this circuit and commencement of the production of a high-grade cerium product.
- Updating of equipment sizing and selection based on the design parameters derived from the metallurgical pilot program (e.g., filtration rates and washing efficiencies) and the updated process mass and energy balance.

In order to optimise the process plant design, the risks in the design which may adversely impact on the ramp-up of production following construction have been extensively examined with risk controls implemented. The key risk controls include test work controls, to demonstrate the viability of the process, provide design information and to provide performance predictions, as described above, and engineering design controls.

The main engineering design controls implemented in the feasibility study update include the effective inclusion of surge capacity in the design, development of a detailed design envelope to incorporate the natural variability in the resource, and consideration of on-stream analysis in the design to aid in process control and stability.

With complex linear metallurgical processes, one of the potential issues is that a disturbance or outage in one stage of the process stops or impacts processing in all stages of the process, making it difficult to stabilise the process and achieve name plate production. For example, the Nolans process could be represented as shown in Figure 7. Without the surge capacity shown, a stoppage or upset condition in any of the stages would potentially cause stoppages both upstream and downstream. To reduce this impact, the design incorporates separation of the linear process into a number of sub-circuits through the inclusion of surge capacity that is shown in Figure 7.

Figure 7: Nolans Process Schematic and Surge Capacity



Consequently, the beneficiation, phosphate extraction, rare earth extraction, rare earth purification and separation circuits will operate largely independently, allowing the stabilisation of each section to proceed more easily and providing a significant improvement in the ramp-up to full production.

The process plant has been designed for 340,000 tpa of concentrate which relates to a nominal 4,518 tpa NdPr oxide with a potential maximum of approximately 4,700 tpa depending on the mining schedule. Table 3 provides a breakdown of the specifications and average tonnages of the rare earth products.

Table 3: Nolans Rare Earth Products

Rare Earth Products			
Product	**TREO (%)**	**REO / TREO (%)**	**Average REO* (t)**
NdPr Oxide	>99.5%	>99.9%	4,440
SEG/HRE Oxide	>99.5%	>99.5%	474
Total			**4,914**

** Average production is calculated as the arithmetic annual average following the anticipated two year ramp up period and excluding the final years of production from low grade stockpiles.*

The by-product of the process will be P_2O_5 contained in merchant grade (MGA) phosphoric acid with an average annual production of 77,972 tpa P_2O_5 in 144,393 tpa of MGA phosphoric acid.

Production by operating year is provided in Table 4.

Figure 8: Metallurgical Process Flowsheet

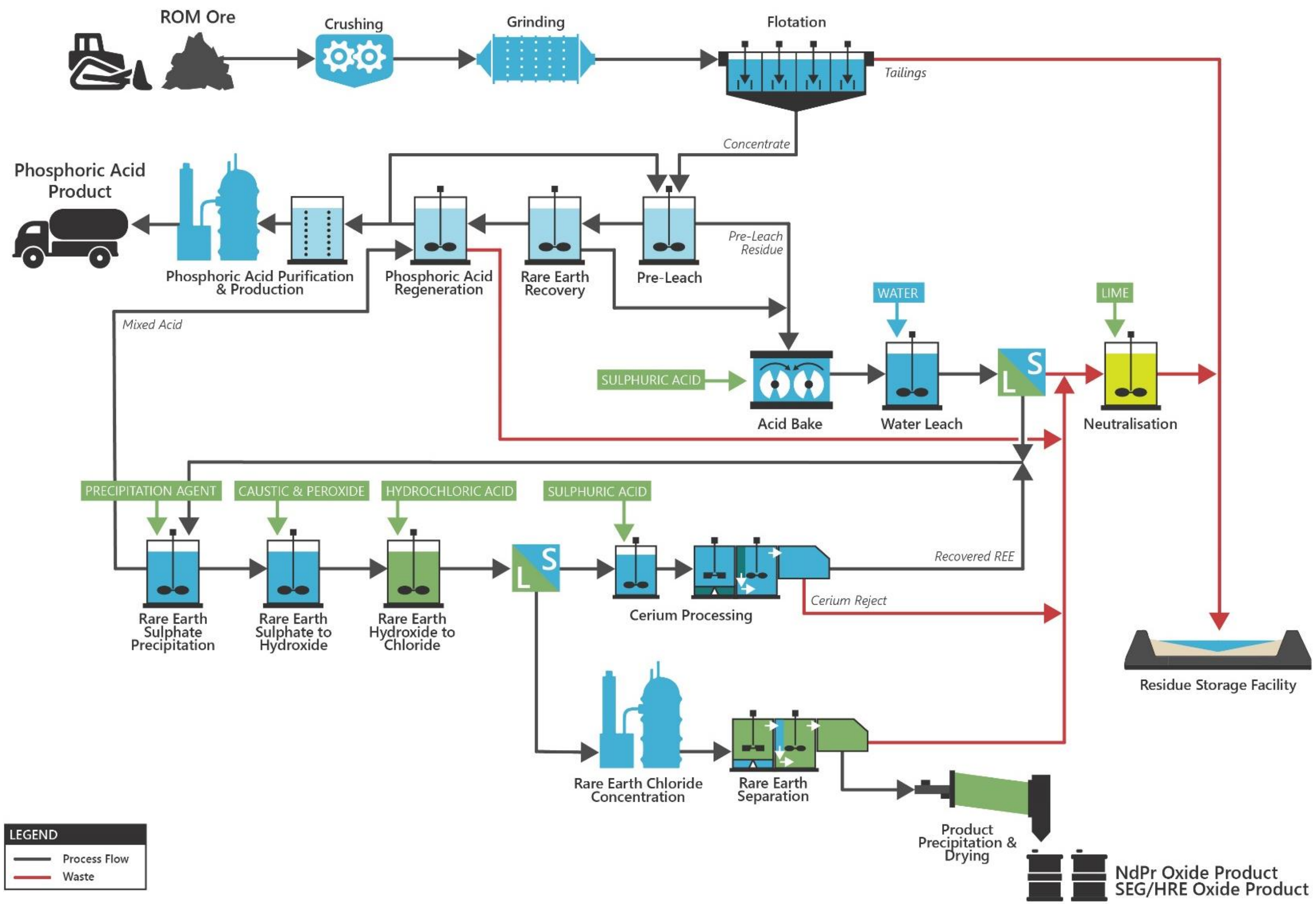


Table 4: Production by Operating Year

Year	yr.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ore Processed	kt	590	814	699	765	814	919	853	853	854	1,098	980	740	947	1,020	999	1,384	1,296	998	771	835
Head Grade																					
P_2O_5	%	13.0	12.6	14.2	14.8	14.9	14.5	15.0	14.9	14.9	11.9	12.5	15.8	13.2	13.7	14.7	11.0	11.0	13.0	15.2	14.8
TREO	%	3.3	3.2	3.4	3.3	3.3	3.2	3.3	3.3	3.3	2.7	2.7	3.3	2.8	3.0	3.2	2.6	2.6	2.8	3.2	3.1
Beneficiation																					
P2O5 Recovery	%	68.8	78.7	85.7	84.1	80.9	75.6	77.0	77.0	77.0	76.1	83.2	87.7	80.3	68.6	67.3	61.9	67.6	78.9	86.4	80.8
TREO Recovery	%	66.5	75.8	83.5	79.0	74.9	67.0	70.2	70.3	70.3	67.2	74.9	82.6	72.4	59.0	59.4	49.8	57.9	71.4	81.2	75.5
Concentrate	kt	198	278	280	314	326	341	333	333	333	341	340	334	334	334	340	340	340	342	334	333
Final Production																					
NdPr Oxide	t	2,529	4,485	4,621	4,661	4,706	4,677	4,710	4,709	4,708	4,533	4,472	4,648	4,374	4,270	4,505	4,123	4,531	4,620	4,639	4,679
SEG/HRE Oxide	t	374	595	610	611	606	596	601	601	601	589	579	602	567	544	572	539	602	612	607	606
P_2O_5	kt	47	66	68	76	79	81	79	78	78	79	82	82	80	77	79	76	77	81	81	80
MGA Phos Acid	kt	88	123	126	141	145	149	146	145	145	147	151	152	147	142	146	140	143	150	150	148

Year	yr.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	TOTAL
Ore Processed	kt	1,116	1,101	1,232	1,111	879	864	901	940	940	1,125	1,351	1,351	1,351	1,511	1,506	1,506	1,506	1,423	**39,940**
Head Grade																				
P_2O_5	%	12.1	11.5	11.2	12.4	15.5	16.0	15.8	15.3	15.3	13.3	11.6	11.6	11.6	8.6	8.1	8.1	8.1	8.1	**490**
TREO	%	2.7	2.7	2.5	2.7	3.4	3.4	3.4	3.3	3.3	2.9	2.6	2.6	2.6	2.1	2.0	2.0	2.0	2.0	**110**
Beneficiation																				
P2O5 Recovery	%	73.4	74.8	69.9	70.6	72.4	72	69.1	68.7	68.7	64.6	59.5	59.5	59.5	57.9	57.5	57.5	57.5	57.5	**2,714**
TREO Recovery	%	65.3	66.9	56.9	58.3	65.3	65.0	61.1	59.8	59.8	53.1	44.9	44.9	44.9	39.0	37.8	37.8	37.8	37.8	**2,345**
Concentrate	kt	341	325	340	340	340	341	340	340	340	341	340	340	340	276	258	258	258	243	**12,147**
Final Production																				
NdPr Oxide	t	4,662	4,578	4,133	4,144	4,585	4,590	4,498	4,448	4,448	4,128	3,701	3,701	3,701	2,841	2,610	2,610	2,610	2,754	**157,946**
SEG/HRE Oxide	t	610	604	540	533	584	587	575	570	570	530	477	477	477	373	345	345	345	326	**20,480**
P_2O_5	kt	79	75	77	78	79	80	79	79	79	77	75	75	75	60	56	56	56	53	**2,813**
MGA Phos Acid	kt	146	139	143	144	146	147	146	146	146	143	138	138	138	112	104	104	104	98	**5,209**

Infrastructure, Operations and Logistics

The majority of the infrastructure included in the feasibility study update for the Project is unchanged from that included in the DFS. Key changes from the DFS included in feasibility study update include:

- Water demand, which is sourced from borefields located south-west of the process plant, has increased to an average of 4 GL/a from 3.4 GL/a, although this change does not impact on the design of the borefields.
- Installation of the main borefield water pipelines will involve the extrusion of the pipe on-site. This method of construction provides both cost and schedule benefits.
- Power generation has been changed from reciprocating gas engines to gas turbines which allow steam to be generated from the waste heat. This additional steam will supplement the steam from sulphuric acid plant to meet the increased steam demand in the process. Duct firing of the gas turbine boilers will allow the process to be operated during outages of the sulphuric acid plant removing the need for stand-by boilers. Overall energy consumption is largely unchanged.
- Due to the increased tonnage to be processed, the LOM residue storage facility (RSF) has been expanded by mirroring the facility to create additional storage cells of the same design. The up-front design to be constructed for first production is unchanged.

The logistic plan, involving the import of reagents and other consumables to site and the export of products to customers, for the Project remains unchanged from the DFS other than the adjustment of reagent, consumable and product quantities. Similarly, the human resources and operations plan for the Project remains unchanged from the DFS.

Implementation

To deliver the Project, Arafura has formed an integrated project management team (IPMT) and contracted KBR and Wave International as partners in this team (*refer ASX announcement 23 January 2020*). The IPMT, or owners' team, has overall project management, project controls, and project delivery responsibility. In addition, the IPMT, through the design office at Wave International, will complete the detailed design for the non-process infrastructure (**NPI**).

The process plant, by far the largest aspect of the Project, will be broken into several packages, being:

- Beneficiation plant.
- Hydrometallurgical plant.
- Sulphuric acid plant.
- Process control system.

By breaking the process plant into these packages Arafura will be able to select "right sized" and appropriately experienced contractors for each package and to select the appropriate contracting model to reflect the value and risk associated with each package.

For the beneficiation plant and sulphuric acid plants the packages will be let on a traditional engineering, procurement, and construction (**EPC**) basis which is reflective of the smaller scale, common nature of the facility and low technical risk. The process control system will be delivered on a rates basis as it is required to bring together the input from the other process plant packages into a coherent process control system.

The hydrometallurgical plant, due to its complex and bespoke nature, will be delivered using a traditional detailed FEED model.

The main aspects of this FEED model for the hydrometallurgical plant are:

- Contracts for the engineering and procurement (engineering contractor) and the construction will be split.
- Detailed FEED will be completed by the engineering contractor to approximately 60-70% of design completion prior to tendering of construction.
- Significant tendering and procurement of equipment will be completed ready to place orders at the end of FEED which will include payment for some certified vendor data to support the engineering design.
- Engineering contract will be carried on rates to a target cost and will include performance and design warranties for the plant.
- Tendering of other contracts (beneficiation plant, acid plant and NPI) will be undertaken in parallel with FEED.

Key advantages of the FEED model include:

- Splitting the engineering and construction contracts will bring in additional contractors for both packages, resulting in a more competitive tendering process.
- Detailed FEED will reduce the risk for construction contractors, which will reduce contingency and risk premiums.
- Advanced design, procurement and tendering at final investment decision (**FID**) will deliver a high level of cost certainty for the Project, improving the confidence of potential project financiers.

The NPI, which is designed by the IPMT, will be contracted in several small to medium packages using a contract model appropriate for each package. Typical NPI packages will include bulk earthworks, roads, village, site buildings, bore drilling, bore fit-out and water supply piping, fencing and communications etc. Sufficient detailed design and tendering of NPI packages will be undertaken in parallel with the FEED for the hydrometallurgical plant to commence early works construction immediately following FID and to meet schedule requirements.

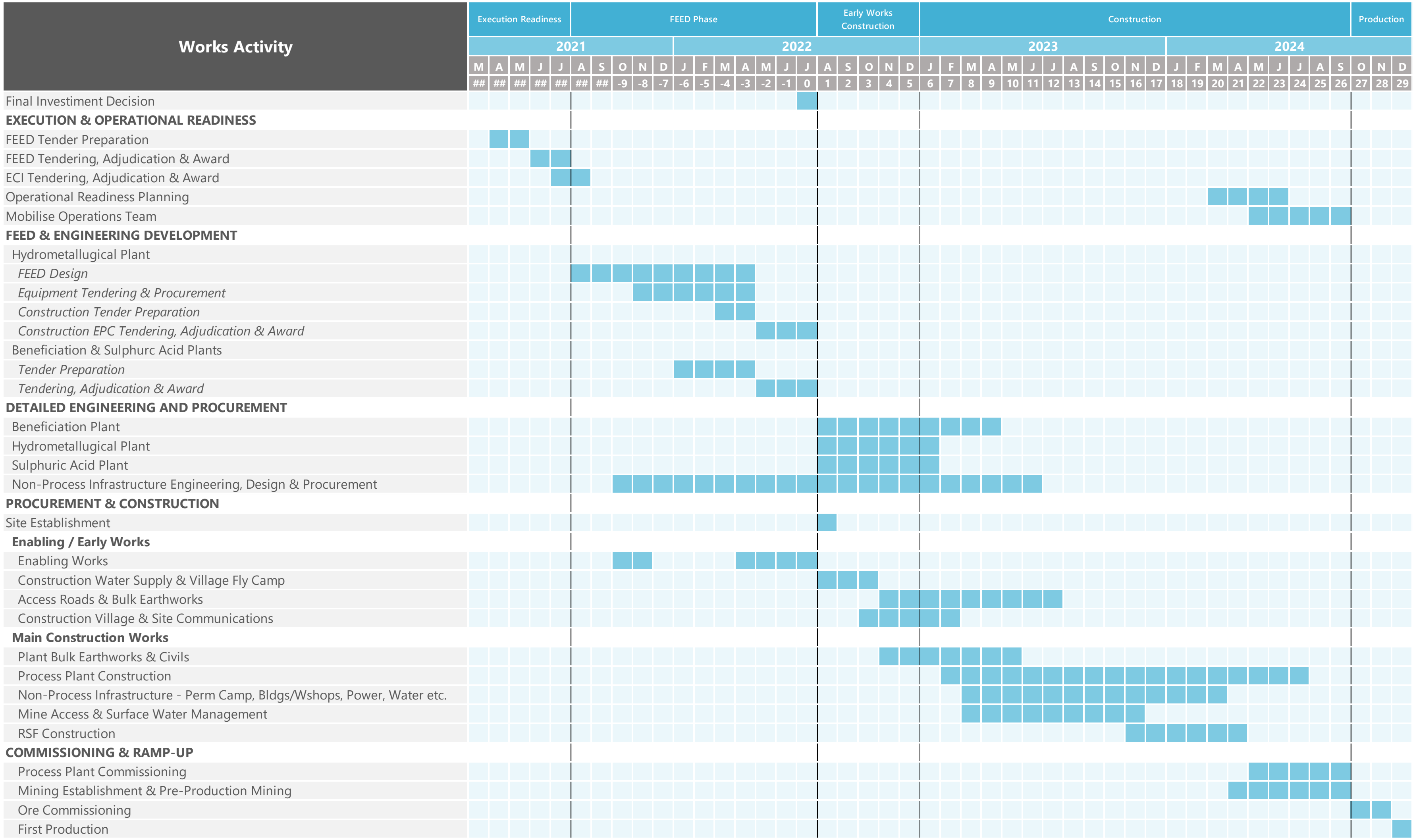
The anticipated costs of the FEED phase of the project delivery are A$39.7m, which are considered sunk costs for the Project financial analysis.

The overall schedule for the Project, from the commencement of FEED, is presented in Figure 9. Key dates include:

- Commencement of FEED in August 2021.
- Completion of FEED and tendering in July 2022 followed by FID in August 2022.
- Construction period of 26 months from FID giving first ore processing in October 2024 and first production towards the end of 2024.

All dates presented are contingent on securing funding for the activities as required.

Figure 9: Nolans Implementation Schedule



Capital Cost Estimate

The updated capital cost estimate has been developed to reflect the flowsheet changes, throughput changes, execution methodology changes and market impacts on rates since the development of the DFS capital cost estimate. The DFS capital cost estimate has been used as a basis for the updated estimate.

The basis of estimate for the updated capital cost estimate is as follows:

- Major equipment supply has been either updated by budget quotation or scaled from the DFS cost based on any change in throughput.
- Bulk materials costs have been adjusted from the DFS estimate by scaling costs based on changes in mechanical equipment costs.
- Growth and wastage allowances have been included as per the allowances in the DFS.
- Construction labour rates have been based on the DFS labour rates adjusted for inflation and a revised construction FIFO schedule (3:1) and validated based a recently completed early engineering works (**EEW**) program.
- The estimate has been compiled on the following execution basis:
  - Combination of engineering, procurement, and construction management (**EPCM**) and EPC package execution.
  - Asian supply and fabrication of structural steel and platework.
  - Traditional field installation with equipment and bulk materials brought to the site, with the largest possible items able to be transported via standard gauge road transport.
- Major NPI rates and quantities have been based on updated preliminary designs and updated budget quotations, with minor costs included unchanged from the DFS.
- EPCM costs have been revised to match the updated execution strategy.
- Owner's costs have been updated by first principles based on the contract with KBR for the IPMT.
- Project indirect costs have generally been included based on detailed estimates and aligned with the execution plan and schedule and have been validated by EEW program.
- Sulphuric acid plant first module only is included, however preliminary works such as earthworks, concrete and tie-in points are included for the remainder of the sulphuric acid plant.
- Sunk capital, deferred capital, pre-production costs, working capital and escalation are excluded.
- The contingency has been adjusted based on the quantitative risk analysis completed during the DFS increasing the contingency to A$126.2m.

The estimate has been compiled in Australian dollars (at fixed exchange rates as used in the DFS of USD:AUD, 0.72 and EUR:AUD, 0.595) and then split back into the native currencies in line with the currency breakdown in the DFS. The estimate was entered into the financial model in the native currencies with the difference reflected as a foreign exchange adjustment. The estimate is consistent with a ACCE Class 3 estimate.

The final updated capital cost estimate is presented in Table 5.

Table 5: Feasibility Study Update Capital Cost Estimate

Overall Project Capital Cost Estimate Summary by Area	
Description	**A$M**
Mining Infrastructure	27.0
Beneficiation Plant	43.3
Hydrometallurgical Plant	567.6
Sulphuric Acid Plant (Module 1)	34.6
Non-Process Infrastructure	121.8
Total Direct Cost	**794.4**
Temporary Construction Facilities	11.9
Travel & Accommodation	11.9
Detailed Engineering & PCM	62.7
Mobile Fleet	5.6
Owner's Cost	42.4
Import Duties	2.8
Total Indirect Cost	**137.2**
Contingency	126.2
Forex Adjustment	(1.5)
Escalation	Excl.
Total	**1056.3**

Note: Numbers may not compute due to rounding. Forex adjustment represents the adjustment to the total capital cost estimate when moving from the fixed estimate exchange rate to the variable exchange rate applied in the financial model over the construction period.

Deferred capital costs for the expansion of the sulphuric acid plant totals A$93.1m scheduled to commence in the first year of production. Deferred capital for the chlor-alkali plant totals A$42.7m scheduled to commence in the sixth year of production.

Operating Cost Estimate

The operating costs presented in the DFS have been reviewed and updated where consumption, costs or methodology has changed. The major impacts on the changes are as follows:

- Mining costs were updated by first principles based on the updated mining schedule, mine design and budget mining contractor submissions.
- Labour costs were reviewed with only minor changes from the DFS for some increase in requirements and minor cost updates, although the final labour cost will be dependent on the labour market conditions at the time of commencing operations.
- Reagent consumption was updated based on the updated process mass balance with major pricing adjusted as follows:
  - Sulphur price was updated according to a long-term supply cost forecast from CRU with shipping cost adjusted based on advice from a bulk shipping company.
  - Caustic soda, hydrochloric acid and hydrogen peroxide prices were updated from domestic suppliers.
  - Oxalic acid, a new reagent for the project update, was priced by a domestic supplier.

- Consumables were adjusted based on the change from ion exchange to nano-filtration to represent the change from resin to membrane consumption. Other consumables were adjusted for anticipated consumption.
- Power generation costs were updated to represent the change from reciprocating gas engines to less efficient gas turbines (with the offset benefit of generating the increased steam consumption) based on a budget quotation for a power station installation on a build, own and operate (**BOO**) basis.
- Gas pricing was updated based on advice from a gas supplier feeding into the Amadeus Gas Pipeline.
- Transport and logistics rates, for both incoming and outgoing freight, have been updated by Qube Bulk, who completed the analysis on transport and logistics for the DFS.

The accuracy of the operating cost estimate remains in line with the DFS and an ACCE Class 3 estimate.

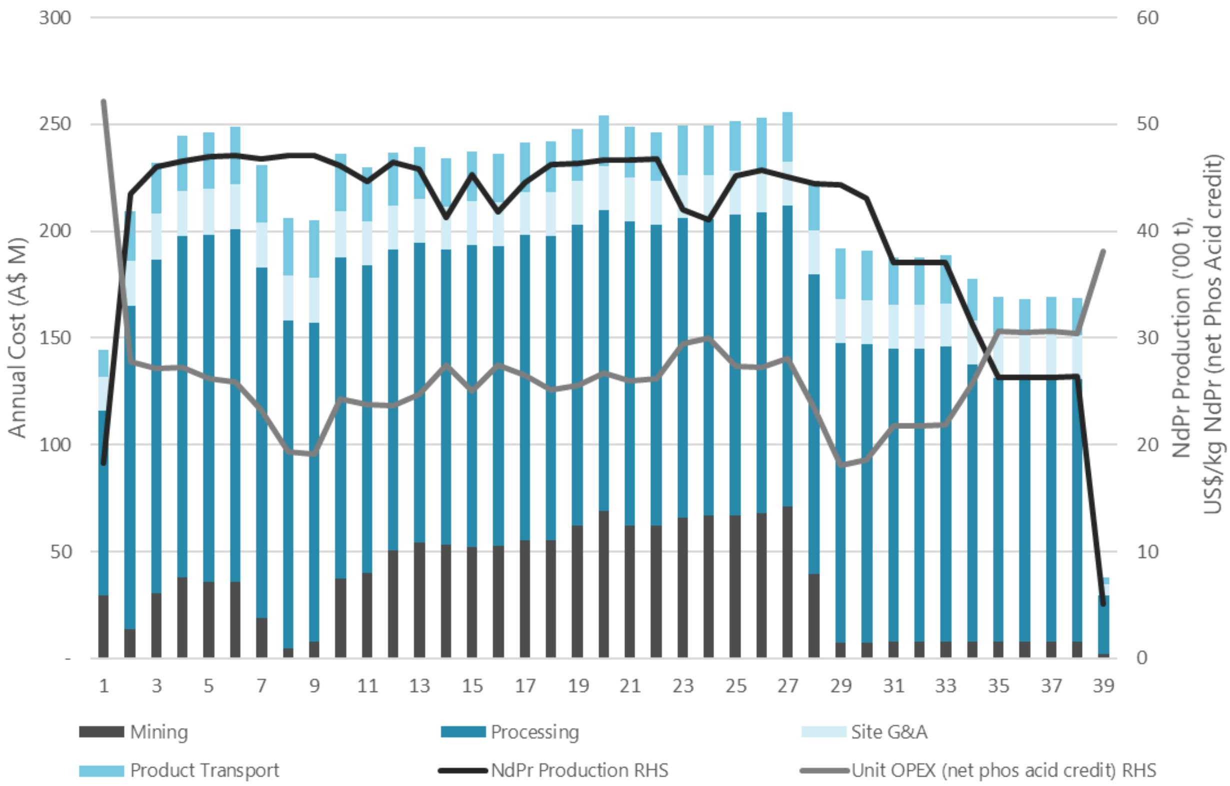
The overall average operating cost, derived from the financial model, is presented in Table 6 and by operating year in Figure 10.

Table 6: Feasibility Study Update Operating Cost Estimate

Project Operating Cost Estimate Summary		
Description	**A$M**	**US$/kg NdPr**
Contract Mining	38.14	6.25
Labour	26.07	4.27
Reagents incl. transport to site	68.77	11.26
Consumables	9.07	1.48
Power & Gas	35.67	5.84
General Transport & Logistics	5.78	0.95
Maintenance	12.64	2.07
Laboratory	2.63	0.43
General & Admin	8.34	1.37
Total Mine Gate Cost	**207.10**	**33.91**
Mine Gate Phosphoric Acid Credit	(55.90)	(9.15)
Mine Gate Cost net of Phosphoric Acid Credit	**151.19**	**24.76**
Rare Earth Product Transport Cost	0.69	0.16

Note: Numbers may not compute because of rounding. Average costs are calculated as the arithmetic annual average following the anticipated two year ramp up period and excluding the final years of production from low grade stockpiles.

Figure 10: Nolans Operating Costs by Operating Year



Marketing

Rare Earth Market

Based on reported pricing by Asian Metal, the NdPr oxide price increased over 60% in the last six months (December 2020 to May 2021) reaching US$84 per kg in May 2021. The price increase in 2021 is attributable to the following market trends:

- Strong demand for rare earth (NdFeB) permanent magnets in the Chinese domestic and overseas markets driven by e-mobility, wind turbine, consumer electronics and other advanced applications.
- Lower NdPr inventory held by Chinese processors and insufficient supply through Chinese quota and imports to meet the growing internal and export demand for magnets.

Global demand for NdFeB sintered magnets is driven by increased use in clean energy technology and e-mobility and forecast to grow at a compound annual growth rate (**CAGR**) of 6% to 2030. Production of NdFeB magnets is expected to double over the next five to ten years and new energy vehicle (**NEV**) application is expected to grow by 17% to 2030. This accelerated expansion of vehicle electrification and the renewable energy transition will increase demand for NdPr oxide and use of NdFeB magnets at a much faster rate over the forecast period.

The outlook for NdPr oxide supply and demand is favourable indicating a looming NdPr oxide supply deficit with NdPr oxide prices to remain at current prices in the short term and rising over the medium to long term forecast period. The supply tightness will encourage the development of new projects outside China to meet the supply shortfall, however, new entrants present challenges with access to project capital and long lead-times to reach full production.

To meet future projected demand for NdPr oxide, supply is projected to increase through the commencement of several advanced rare earth projects and continued expansion of the Chinese domestic supply under strict production quota control. Additional supply through new projects is unlikely to keep up with overall demand as limited projects are forecast to come into production before 2025. Additional capacity is expected to be developed in Australia and North America with China's supply control expected to be reduced in the next decade as new rest-of-world (**ROW**) supply emerges. Supply growth of 50,000 tonnes per annum of NdPr oxide is required over the next decade, which is equivalent to several Nolans projects over this period of time.

China also plans to become a major NEV manufacturer and relies on domestic supply and the continued expansion of imported NdPr bearing material to meet internal demand with preference to supply NdPr oxide to Chinese magnet producers and the Chinese domestic automotive industry. China's ability to increase production rapidly is becoming constrained through improved environmental standards, resource preservation strategies, production quota control with higher operating and environmental costs of new supply is expected over the next decade.

Rare Earth Price Forecast

Forecast prices have been sourced from several independent consulting groups providing market supply and demand analysis and price forecasts. The independent price outlook used in the feasibility study update is based on NdPr oxide market supply and demand dynamics driven by macroeconomic and geopolitical events, global projection of NdFeB magnets and forecast production and supply.

Forecast prices for middle and heavy rare earth products are also supplied through and independent agency and the pricing mechanism is based on 35% realizable value of the contained value of the rare earth oxide composition in the Nolans SEG/HRE oxide product and based upon the estimated range if discounting in the independent report.

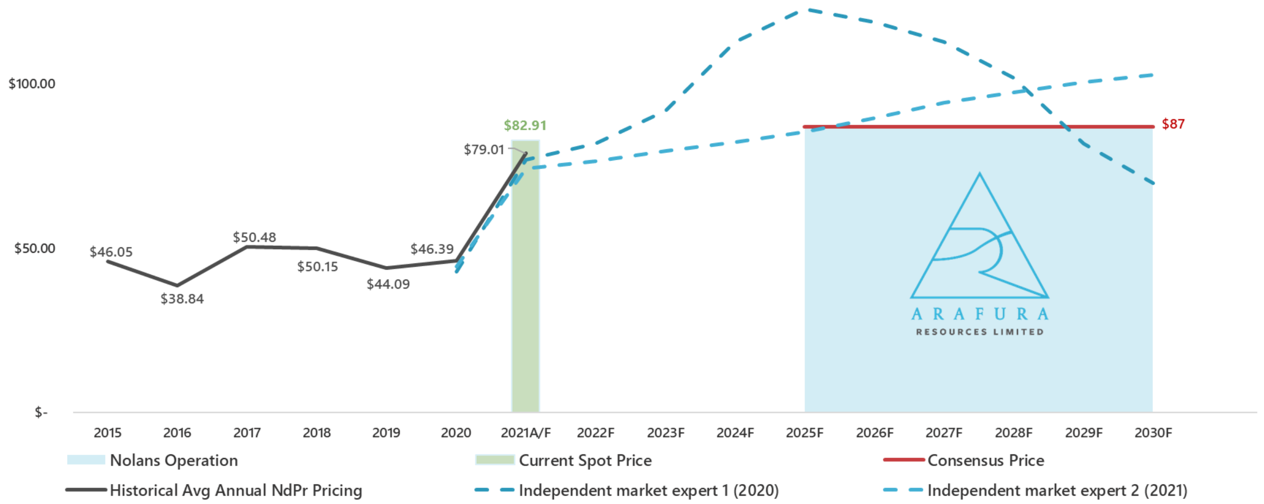
The Company has utilised a consensus price in its financial evaluation of the Project. A consensus price for NdPr oxide has been derived from a rolling forward average calculation commencing in 2025 utilising prices forecast on a real basis from two independent market analysts[1]. The consensus price for NdPr oxide of US$87.00 per kilogram is a conservative price estimate given spot price is currently at $82.91[2]. Figure 11 shows the basis of the derivation of the NdPr oxide consensus price.

A consensus price for Nolans SEG/HRE product has been derived in a similar manner to the NdPr oxide consensus price from Adamas Intelligence. The consensus price for the SEG/HRE product is US$9.86 per kilogram.

[1] *Adamas Intelligence and CRU have supplied price forecasts for rare earth oxides covering the period from 2020- 2030 which were used to calculate the financial evaluation of the Project based on its life of mine inventory.*

[2] *Average NdPr oxide prices calculated using Asian Metals by calendar year. 2021 utilises pricing for the period 1 January 2021 to 30 April 2021. Current spot price of $82.91 as at 30 April 2021.*

Figure 11: NdPr Oxide Consensus Price



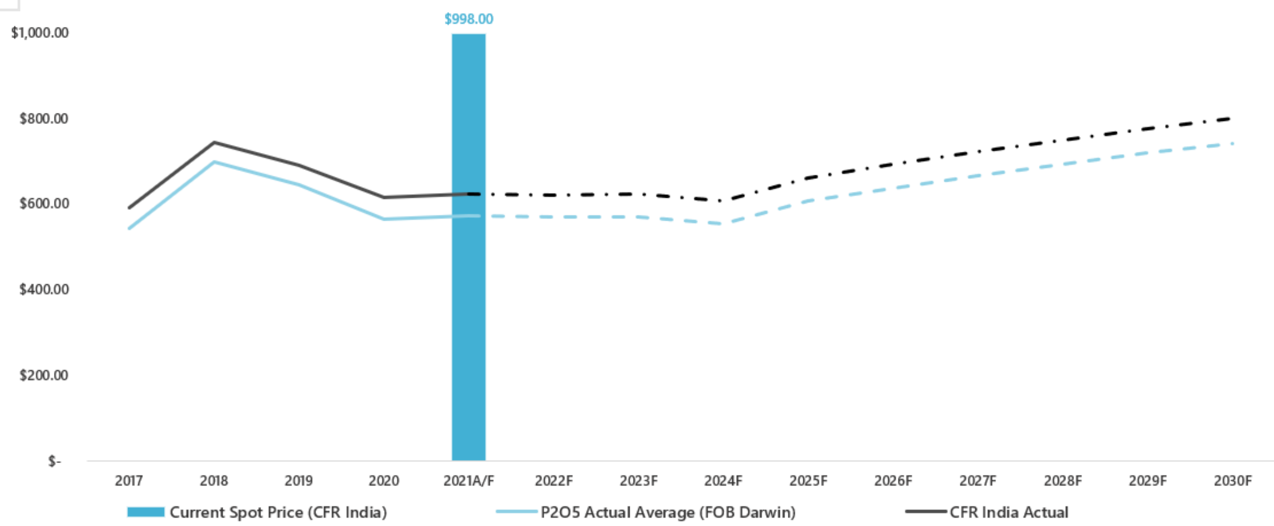
Sources: Adamas Intelligence and CRU have supplied price forecasts for rare earth oxides covering the period from 2020- 2030 which were used to calculate the financial evaluation of the Project based on its life of mine inventory. Average NdPr oxide prices calculated using Asian Metals by calendar year. 2021 utilises pricing for the period 1 January 2021 to 30 April 2021. Current spot price of $82.91 as at 30 April 2021.

Phosphoric Acid Forecast

Phosphoric acid prices in 2021 are rising after a subdued period in 2020 with increased demand for phosphate-based fertilizers in the Asia-Pacific region and stronger demand for Indian phosphoric acid trade. Medium and long-term phosphoric acid price projections from CRU through to 2030 predict future price growth from 2025 after declining from peak prices in 2021. Long-term, prices over the forecast period are anticipated to rise due to tightening supply, greater Indian fertilizer demand growth and slower capacity additions by major producers in Middle East and North Africa. CRU is predicting a tightening supply of acid with continued increased demand for fertilizers in the Indian markets and other Asian regions creating higher projected export prices.

The latest price forecast for phosphate, on an FOB-Darwin basis, shown in Figure 12.

Figure 12: P_2O_5 Forecast Price



Source: CRU Consulting. CFR India Q2 2021 phosphoric acid prices agreed on 16 April 2021.

A summary of the pricing assumptions used in the financial evaluation is shown in Table 7.

Table 7: Summary of Pricing Assumptions (US$/kg for Rare Earths, US$/t for P_2O_5)

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+
NdPr Oxide	87.00	87.00	87.00	87.00	87.00	87.00	87.00	87.00	87.00	87.00	87.00
SEGHRE	9.86	9.86	9.86	9.86	9.86	9.86	9.86	9.86	9.86	9.86	9.86
P_2O_5 (FOB Darwin)	566.17	572.64	571.09	570.37	553.93	607.05	637.23	666.29	693.49	718.99	742.87

Financial Analysis

The financial evaluation of the Project has been undertaken using a Discounted Cash Flow (**DCF**) analysis in Australian dollars. The evaluation includes only cash flows from the Project and excludes potential cash flows from exploration activities or other assets held by Arafura. A net present value (**NPV**) and internal rate of return (**IRR**) for the Project have been calculated over a 38-year operational period.

For the financial evaluation it has been assumed that the Project is funded entirely through equity with no accounting for uplift that may result from any debt component of financing, however, it is likely that the Project will be at least partly funded through debt facilities.

Methodology and Assumptions

The following has been used as the basis for the financial evaluation:

- Project construction period of 26 months followed by a 38-year operation period, based on processing the mining inventory, including a two-year ramp-up period to full production and five years at the end of the LOM processing low grade material from long term stockpiles.
- Capital costs as presented above together with inclusions for working capital, pre-production costs, deferred capital for modular construction of the sulphuric acid plant, chlor-alkali plant and beneficiation plant expansion.
- Operating costs as presented above have been applied to the mining schedule, with an allowance for additional labour, reagents, consumables and consultants during the ramp-up period with an aim of reducing the ramp-up time.
- Sustaining capital distributed across the operating period from year six of operation and including $20 million across years one and two of production to assist in debottlenecking and achieving production ramp-up.
- US$/A$ exchange rate of 0.674 in 2020, increasing to 0.727 by 2025 and remaining constant thereafter.
- Discount rate of 8%, representing the estimated cost of capital, with post-tax NPV calculated at FID.
- Royalties have been included to allow for payments required under the NT Mineral Royalties Act and with payments to be made in accordance with the NTA executed with the native title holders of the Project area.
- Product pricing forecasts as outlined above based on independent marketing reports prepared by CRU Consulting and Adamas Intelligence for rare earths and CRU for phosphoric acid as outlined above.
- All other assumptions remain unchanged from the DFS report.

Financial Outcomes

An overview of the financial results is set out in Table 9 with the Project forecast to generate average sales revenue of A$585m (US$425m) per annum, net of selling expenses and royalties. Total revenue will include A$531m (US$386m) per annum of NdPr oxide which will comprise approximately 87% of total revenue.

Table 8: Project Financial Overview

Financial Overview		
Description	**US$M/a**	**A$M/a**
Sales Revenue		
Rare Earth Products	388	534
Phosphoric Acid	58	79
Royalties & Selling Expenses	20	28
Net Revenue	**425**	**585**
Operating Expenditure		
Mining	30	42
Processing	105	145
General & Administration	15	21
Total Operating Expenditure	**151**	**207**
Product Transport	18	24
EBITDA	**257**	**354**

Note: Numbers may not compute because of rounding. Average revenue, costs and EBITDA are calculated as the arithmetic annual average following the anticipated two year ramp up period and excluding the final years of production from low grade stockpiles.

An overview of financial key performance indicators is set out in Table 9. After offsetting the MGA phosphoric acid by-product revenue, the Project's operating cost will be reduced to US$24.76 per kilogram of NdPr oxide.

The Project will have an NPV of A$1,402m (US$1,011m) at an 8% discount rate and an IRR of 18.13% on an after-tax basis, calculated over the LOM. The after-tax payback occurs in year 6 of operations.

Table 9: Project Financial Key Performance Indicators

KPI Analysis		
Description	**US$**	**A$**
Operating Cost $/kg NdPr (Average)	33.91	46.60
Operating Cost $/kg NdPr less Phosphoric Acid by-product (Average)	24.76	34.06
NPV_8 after tax (million)	1,011	1,402
IRR after tax (%)	18.13%	
After tax payback	Year 5.3	

Note: Average costs are calculated as the arithmetic annual average following the anticipated two year ramp up period and excluding the final years of production from low grade stockpiles.

It should be noted that there is a low level of geological confidence associated with Inferred Mineral Resources included in the production target on which this financial analysis is partly based 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.

Reserve Only Case

The financial analysis was also carried out for the Ore Reserves only case to demonstrate that the Project viability is not reliant on Inferred Mineral Resources included in the mining inventory. This production schedule over 29-years, including a two year ramp up and approximately two years at the end of the LOM processing low grade material off long term stockpiles, delivers a A$1,229m NPV at 8% discount rate, and IRR of 17.88% and average operating costs of US$26.09 per kg of NdPr net of phosphoric acid by-product credit.

Project Funding

The total Project funding requirement has been calculated to be $A1,193m (US$868m) as shown in Table 10. Pre-production costs include mining, labour and inventories expended prior to first production. Working capital expenditure incorporates working capital for differences in trade terms along with the funding of forecast de-bottlenecking costs and the deferred capital for the expansion of the sulphuric acid plant, over and above the projected revenue from sales. Provision for capital escalation is calculated at of 2.0% per annum adjusted against the proposed capital expenditure drawdown over design and construction.

The funding is based on 100% equity and excludes debt and other related finance costs as well as any environmental or other bonds and securities that may be payable. The total Project funding also reflects movement in values as a result of exchange rate fluctuations during the drawdown period.

Table 10: Nolans Project Funding Requirement

Project Funding		
Description	**US$M**	**A$M**
Capital Expenditure (based on forecast exchange rates)	768	1,056
Pre-production Costs incl. mining, labour, spares & inventory	36	49
Working Capital incl. funding debottlenecking, acid plant deferred capital	50	69
Capital Escalation	14	19
Project Funding	**868**	**1,193**

Forward Looking Statement

This report contains certain statements which may constitute "forward-looking statements." Such statements are only expectations or beliefs and are subject to inherent risks and uncertainties which could cause actual values, results or performance achievements to differ materially from those expressed or implied in this report. No representation or warranty, express or implied is made by Arafura Resources that any forward-looking statement contained in this report will occur, be achieved or prove to be correct. You are cautioned against relying upon any forward-looking statement.

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Mineral Resources and Ore Reserves

The information in this report that relates to Mineral Resources is extracted from the Company's ASX announcement dated 7 June 2017 (Detailed Resource Assessment Completed) and was completed in accordance with the guidelines of the JORC Code (2012). The information in this report that relates to Ore Reserves is extracted from the Company's ASX announcement dated 16 March 2020 (Major Increase in Mine Life for the Nolans Project) and was completed in accordance with the guidelines of the JORC Code (2012). Arafura Resources confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the estimates in the original market announcements continue to apply and have not materially changed. Arafura Resources 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.