



**ASX ANNOUNCEMENT** 

# MARCH 2019 QUARTERLY ACTIVITIES REPORT

# HIGHLIGHTS

**Baobab Project feasibility study** 

- Baobab Project expansion feasible at targeted 1 Mtpa phosphate rock concentrate capacity
- Very high-grade 36.4% P<sub>2</sub>O<sub>5</sub> phosphate rock concentrate product
- Maiden Probable Ore Reserve of 39.3 Mt at 18.9% P<sub>2</sub>O<sub>5</sub>
- Strong Project economics
  - $_{\odot}$  Unlevered, post-tax NPV\_{8\%} of US\$212M (A\$294M)^1 and IRR of 25.5%
  - Free cashflow (post all capital expenditures and tax) of US544\$M (A\$756M)<sup>1</sup> and EBITDA of US\$1,020M (A\$1,417M)<sup>1</sup>
  - Pre-production capital expenditure of US\$183M (A\$254M)<sup>1</sup>
  - Payback period of 3.3 years from first production, 5.3 years from detailed engineering start
- Estimated average direct operating costs of US\$56/t of 36.4% P<sub>2</sub>O<sub>5</sub> concentrate produced
- Initial 13.4-year mine life, based just on the Project's Indicated Mineral Resource

### Corporate

- US\$0.9 million shareholder bridge loans secured
- Novaphos is moving to commercialisation of its super-phosphoric acid technology
- A\$1.3 million cash balance at 31 March 2019

# 1. BAOBAB PHOSPHATE PROJECT (Avenira 80%)

# 1.1 EXPANSION AND UPGRADE PROJECT

During the March 2019 quarter, Avenira announced the completion of the Feasibility Study ('FS', 'Feasibility Study' or the 'Study') (Class 4 estimate) for the expansion of its 80%-owned Baobab Phosphate Project ('Project') in the Republic of Senegal to a projected high-grade phosphate rock mine with a concentrate product capacity of 1 Mtpa. The FS confirms the technical and financial robustness of a long-life operation for the Company's Baobab Phosphate Project.

This Feasibility Study is classified as an AACE Class 4 estimate with a  $\pm$  20% estimated accuracy. The "Bankable" or "Definitive" Feasibility Study ('BFS') phase intended to follow will target an AACE Class 3 estimate with a  $\pm$ 10% accuracy.

The FS is based on an open-pit strip-mining design and conventional flotation and magnetic separation ore processing plant operating at an ore throughput of 2.9Mtpa and a phosphate rock concentrate post ramp-up production rate of 1Mtpa. It determined that the Project's Probable Ore Reserve is 39.3Mt at 18.9% P<sub>2</sub>O<sub>5</sub>.

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The Study indicates a technically sound and financially robust project, delivering post-tax unlevered NPV of US\$212M and IRR of 25.5% over a 13.4-year mine life based on the Project's Indicated Resource.

Finalisation of the FS represents a key milestone in the evolution of the Project. The Company intends to initiate the BFS phase (Class 3 estimate) once the final project configuration has been confirmed as part of a planned value-engineering study. Concurrently, the Company intends to undertake more advanced and detailed discussions with potential funding parties. BFS completion is projected to take place during the December 2019 Quarter.

#### **KEY PROJECT METRICS**

Life of Mine Physical Parameters	Units	Value	
Life of Mine	Years	13.4	
Ore tonnes Mined	Mt	39.3	
Total phosphate rock production	Mt	13.2	
LOM Average P2O5 recovery	%	65	

#### Table 1: Production Parameters

Life of Mine Financial Outcomes	Units	Value
Baobab Phosphate Rock Concentrate FOB Dakar Price (LOM range)	US\$/t	138 - 164
Total Revenue	US\$M	1,997
EBITDA	US\$M	1,020
NPV <sub>8%</sub> (unlevered, pre-tax)	US\$M	306
IRR (unlevered, pre-tax)	%	29.4
NPV <sub>8%</sub> (unlevered, post-tax)	US\$M	212
IRR (unlevered, post-tax)	%	25.5
Free cash flow (post all capital expenditures and tax)	US\$M	544
Pre-production Capital Expenditure	US\$M	183.1
Post-Commissioning Sustaining Capital Expenditure	US\$M	61.2
Mobile Equipment Costs included in Pre-production and Sustaining Capital Expenditures	US\$M	59.3
Payback from First Production	Years	3.3
Payback from Start of Detailed Engineering	Years	5.3

Table 2: Key Financial Outcomes

The key assumptions in the economic evaluation of the project include no terminal value and no inflation plus the assumptions outlined in Table 3.



Financial Assumptions	Unit	Value
Discount Rate (real basis)	%	8.0%
Senegal Government Royalty	%	5.0%
Private royalties	%	3.5%
Corporate tax rate	%	30%

#### Table 3: Key Financial Model Assumptions

The Project is 100%-owned by BMCC, itself 80%-owned by Avenira. As part of the post-Exploitation Permit award restructuring, the government of Senegal will be awarded 10% free-carried interest in the Project and BMCC's ownership will thereby be reduced to 90%, thus reducing Avenira's ownership to 72%: Avenira's share of Project expenditures and returns will therefore be 72% of the corresponding total Project amounts.

Unless otherwise stated, all financial numbers are in US\$ and are based on 100% of the Project. All tonne ('t') references are to dry metric tonnes. Base date for estimated capital expenditures is August 1, 2018.

Component	$P_2O_5$	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	$AI_2O_3$	MgO	CaO/P <sub>2</sub> O <sub>5</sub>
Baobab Phosphate	26.4%	9 70/	1.2%	0.8%	0.1%	1 20
Rock Concentrate	30.4 /0	0.7 /0	1.270	0.070	0.170	1.50

Table 4: Projected Typical Analysis, Gadde Bissik Phosphate Rock Concentrate

### TENURE

Avenira was granted an Exploitation Permit (Permit) dated 27 September 2018 and notified to Baobab Mining & Chemicals Corporation SA ('BMCC), Avenira's 80%-owned subsidiary, on 17 October 2018 by Presidential Decree. The Permit covers an area of 75 km<sup>2</sup> around the former Gadde Bissik Small Mine Permit (SMP) and is valid for an initial renewable term of 20 years. Following the restructure triggered by this Permit grant, the Senegalese Government will hold a 10% free-carried interest in the operating entity that holds the Permit.



Figure 1: Location of Baobab Phosphate Project

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### **GEOLOGY & RESOURCE ESTIMATION**

The Exploration Permit covers an area of  $1,163 \text{ km}^2$  around the Exploitation Permit. The Indicated Mineral Resource within the Exploitation Permit area is estimated at 41.8Mt at  $19.4\% P_2O_5$  at a cut-off grade of  $10\% P_2O_5$ , and the Inferred Mineral Resource within this same area is estimated at 247 Mt at  $16\% P_2O_5$  at a cut-off grade of  $10\% P_2O_5$ , both taking into account depletion by mining to date (see Table 5) and rounded to reflect the precision of estimates and therefore including rounding errors. The Mineral Resource estimates are inclusive of Ore Reserves.

Area	Deposit	Classification	Mt	P₂O₅ %	CaO %	MgO %	Al <sub>2</sub> O3 %	Fe <sub>2</sub> O <sub>3</sub> %	SiO₂ %
	Cadda Rissik East	Indicated	41.8	19.4	26.8	0.08	2.23	3.87	44.0
	Gaude dissik east	Inferred	136	16	22	0.17	3.4	4.0	51
Within Exploitation	Gandal	Inferred	31	15	21	0.10	4.3	7.9	46
Permit	Gadde Escale	Inferred	80	16	23	0.15	2.4	3.0	52
	Subtotal within	Indicated	41.8	19.4	26.8	0.08	2.23	3.87	44.0
	Exploitation Permit	Inferred	247	16	22	0.16	3.2	4.1	50
	Cadda Pizzik East	Indicated	0.3	16.4	22.3	0.17	3.96	3.76	48.7
	Gaude dissik east	Inferred	9	16	22	0.19	4.2	3.3	50
	Gadde Bissik West	Inferred	26	13	17	0.35	6.7	7.0	48
Outside	Gandal	Inferred	1	14	19	0.06	2.5	6.9	54
Permit	Gadde Escale	Inferred	2	15	21	0.32	2.9	4.6	51
	Dinguiraye	Inferred	35	17	25	0.24	3.4	3.7	46
	Subtotal outside	Indicated	0.3	16.4	22.3	0.17	3.96	3.76	48.7
	Exploitation Permit	Inferred	73	15	21	0.27	4.7	4.9	48
Total Resource		Indicated	42.1	19.4	26.8	0.08	2.24	3.87	44.0
		Inferred	320	16	22	0.18	3.5	4.3	50

Table 5: Gadde Bissik Mineral Resource Estimates at 10% P<sub>2</sub>O<sub>5</sub> Cut-off Grade

The estimated Indicated Mineral Resource and estimated Inferred Mineral Resource within the Exploitation Permit area represent 99% of the total estimated Indicated Mineral Resource and 77% of the total estimated Inferred Mineral Resource, respectively, within the Company's Baobab Project Cherif Lo-Ngakham Exploration Permit as identified in the Company's most recent Mineral Resource estimates.

#### MINING

The Company engaged Wood PLC to complete a mining study on the Project. Mining will be open pit and freedigging within a sedimentary type deposit, eliminating the need for costly drill and blast operations.

The results of a trade-off study indicate that a strip-mining method using dozers for the movement of overburden material and a combination of excavators and 8 x 4 trucks for ore mining is the most cost effective, feasible combination for the extraction of the ore at the Gadde Bissik deposit.

Pit optimisation studies confirmed the development of a strip-mining sequence that, in addition to facilitating access to higher grade ore in the early stages of the mine plan, also minimises mine development costs by using the existing open pit for access.





Mine planning dictates that two strips be operational at the same time (utilising two excavators), targeting the production of about 2.9Mtpa of ore to achieve an output of 1Mtpa of phosphate concentrate. The mine plan extends to year 13.4 incorporating only Indicated Mineral Resources.

The mining plan calls for 307.2Mt of overburden waste material to be dozer-pushed to give access to the 39.3Mt of ore to be extracted over the projected Indicated Resource mine life of about 13.4 years, adding up to a LOM-average stripping ratio of 7.8.

### ORE RESERVE

Wood PLC reported the maiden Ore Reserves in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, JORC Code 2012.

Reserves were estimated from the block model after mining dilution, based on pit-optimisation run at a variable cut-off, using a minimum, pre-royalties,  $34.7\% P_2O_5$  concentrate product price of  $97.561 \notin$  (120 US\$/t at 1.23 US\$: $\notin$ ), ore recoveries as advised by the metallurgical test work and software simulations, and estimated mining, processing, logistics and overhead costs.

Ore Reserves for the deposit total 39.3 Mt grading  $18.9\% P_2O_5$ , based on an estimated Indicated Mineral Resource of 41.8 Mt at  $19.4\% P_2O_5$  within the Permit area. The full amount of reserves has been classified as Probable Reserves as they derive exclusively from Indicated Resources.

A tabulation of the Ore Reserve categories based on the mine planning sequence proposed for the Indicated Mineral Resource of the deposit is presented in Table 6 below.

Reserves	Ore (kt)	P₂O₅ Grade (%)	P₂O₅ Content (kt)	Al <sub>2</sub> O <sub>3</sub> (%)	CaO (%)	Fe₂O₃ (%)	MgO (%)	SiO₂ (%)	CaO/P₂O₅
Proved	-	-	-	-	-	-	-	-	-
Probable	39,305	18.9	7,446	2.1	26.1	3.7	0.1	43.2	1.38
Total	39,305	18.9	7,446	2.1	26.1	3.7	0.1	43.2	1.38

Table 6: Ore Reserves for Baobab Exploitation Permit Mining Lease

All of the Indicated Mineral Resource that forms part of the tonnage that is Ore Reserves in Table 6 above is within the Exploitation Permit, which includes the entire area of mining considered in this Study.

After mining losses and dilution, 39.3 Mt of ore at an average grade of 18.9% P<sub>2</sub>O<sub>5</sub> are projected to be mined and hauled to the primary crusher feedbin for processing over 13.4 years of mining within the Indicated Mineral Resource area of the Permit.

### PROCESS & METALLURGY

The process plant is designed to separate clay, silica, iron and other minor gangue minerals present in the ore from the phosphate containing minerals to achieve a phosphate concentrate with maximum assays of 8%  $SiO_2$  and 1%  $Fe_2O_3$ . The plant design target is to produce ~1Mtpa of concentrate by varying the feed tonnage within the design allowance parameters.

#### **Process Description**

The process plant receives ore from the mining area via mine trucks. Ore is crushed in a three-stage crushing circuit, with the tertiary stage in closed circuit with a screen, to produce a beneficiation circuit feed of -20 mm. Material from the crushed ore stockpile is fed at a controlled rate to the rod mill closed-circuit screen (cutting at





2mm). The screen undersize (-2 mm) is then split into a pebble fraction (+850  $\mu$ m) sent to magnetic separation and a fines fraction (-850  $\mu$ m) delivered to the flotation feed preparation circuit. The reverse flotation circuit is a staged rougher flotation configuration, with the sinks (concentrate) combining with the pebble fraction for iron removal in the magnetic separation circuit. The final concentrate is dewatered in 3 stage: thickening followed by horizontal vacuum belt filtration and by rotary drying targeting a  $\pm$ 3% moisture content. The dry concentrate is stored on a covered stockpile and then loaded into trucks.

The slimes fraction is dewatered in a thickener prior to disposal. Flotation circuit floats (silica tailings) and magnetics are delivered to a separate "Sand" facility (utilising cyclones for initial dewatering). The cyclones overflow is delivered to a clarifier and the underflow combined with the slimes thickener underflow. The overflows from the thickeners and the clarifier are recycled as process water. Other water, air and reagent services are included as part of the process plant design.

The process mass and water balances were completed using Metsim® software. The basis for the Metsim model was completed by Project Simulation Consulting.

With 39.3 Mt of ore at 18.9%  $P_2O_5$ , which corresponds to 7.446 Mt $P_2O_5$ , projected to be processed over the Ore Reserve LOM, and 13.2 Mt of phosphate rock concentrate at 36.4%  $P_2O_5$ , which corresponds to 4.8 Mt $P_2O_5$ , produced over the period, overall average projected processing recovery stands at 65%.

### TAILINGS MANAGEMENT

Fines (slimes) residue and coarse tailings (sand) will be separately discharged to two separate dedicated storage areas. After the first year, tailings will be delivered as backfill to the mining pit area. The tailings deposition strategy minimises both initial capital and sustaining capital costs and also facilitate the implementation of the closure strategy.

To achieve these objectives a combination of surface and "in-pit" disposal will be implemented. Year 1, slimes will be discharged via open-end/spigots in a purpose-built 'surface' Slimes Residue Storage Facility ('SRSF'), located west of the Processing Plant area and coarse tailings (sand) will be discharged via a cyclone system into a dedicated 'surface' Tailings Storage Facility (TSF) confined by 1 m-high confining and flow-control berms, located south of the SRSF. Years 2 and 3, slimes will continue to be discharged via open-end/spigots into the SRSF and coarse tailings (sand) will be discharged via cyclone into the mined-out (inactive haul road) area. From year 4 onwards, slimes and coarse tailings (sand) will both be discharged into the mined-out area.

#### SITE, INFRASTRUCTURE & ENGINEERING DESIGN

Infrastructure items which have been catered for in both the design and estimate include bulk earthworks and terracing, re-routed 7.2 km long and 8 m wide access road, and overhead power line, ponds, buildings **and** workshops, sewage and fencing. There are few site selection, layout or infrastructure constraints.

Grid power is available in adequate quantities by accessing the 90 kV HT national distribution grid operated by Senelec at the Mékhé transformer station approximately 30 km from site, and this is the power supply option selected for this Study, with the estimated cost to build a 30 km-long HT connection line included in the Project's capital expenditures.



### **CAPITAL ESTIMATE**

The total capital cost estimated to achieve the defined scope of work for mining, process plant, infrastructure and TSF for the Baobab Phosphate Project is US\$183.1M, excluding allowance for traditional Owners Cost (such costs, as estimated, are factored in the Project's financial model).

A summary of the capital cost estimate by major area is presented in Table 7. The base date of the estimate is 1 August 2018 and the currency of the estimate is US\$.

Description	Capital Expenditure (US\$M)
Mine Development	5.0
Tailings Storage Facility	10.4
Site and Port Infrastructure & Bulk Earthworks	15.8
Process Plant	79.8
Total Direct Field Costs	111.0
Total Indirect Field Costs	14.4
Total Net Cost	125.4
Total Contingency & Other Costs	24.7
Overhead Power Supply & Reticulation	8.9
Mining & Other Mobile Equipment	19.2
Site Establishment, Eq. Relocation, First Fills & Spares	4.9
Total Pre-Production Project Capital Expenditure	183.1

Table 7: Feasibility Study Pre-Production Capital Cost Estimate for Baobab Phosphate Project

A post-production capital amount of US\$61M has been estimated and includes sustaining mining and processing capital, further mine development costs, relocation costs and rehabilitation costs. Mobile equipment purchases account for US\$59.3M of the total LOM US\$244M capital expenditures.

The capital cost estimate was developed within a level of accuracy of  $\pm 20\%$  (AACE Class 4). It must be noted that certain components of the capital cost estimate were developed to an accuracy level of  $\pm 10\%$  (AACE Class 3). These components are:

- Mining Fleet.
- TSF, namely the SRSF and the Coarse Sand TSF.

The inclusion of the Class 3 components in the capital cost estimate improves the overall confidence level of the capital cost estimate.

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Power supply by a contracted Independent Power Provider instead of connecting to and purchasing from the national power grid, leasing the mining and other mobile equipment instead of purchasing outright, as well as contract mining will be further reviewed during the upcoming engineering study phases as part of additional capital costs to operating costs trade-off studies.

## **OPERATING COST ESTIMATE**

The direct operating costs include the mining operations, process plant, port area facilities and the TSF. The Project operating cost estimate is applicable for a process plant that will process  $\pm 2.94$  Mtpa of phosphate ore with a nominal grade of  $\approx 19.4\%$  P<sub>2</sub>O<sub>5</sub>, to produce 1 Mtpa of product.

The direct operating cost estimate was developed within a level of accuracy of  $\pm$  20% (AACE Class 4).

Table 8 summarises the direct operating costs by cost centre of the Project, per ton of  $36.4\% P_2O_5$  Phosphate Rock Concentrate product.

Royalty fees, in-country administration overhead costs and social & institutional support expenditures are not included in direct operating costs listed in Table 8.

Direct Operating Costs, US\$/t Rock Concentrate				
Mining	\$20.9			
Labour	\$2.1			
Reagents, Materials, Consumables & Miscellaneous	\$4.3			
Power	\$5.5			
HFO	\$8.0			
Concentrate Transport & Port Handling	\$15.4			
Total	\$56.3			

Table 8: Project Direct Operating Costs Summary per Cost Centre

#### MARKETING

Projected Baobab phosphate rock concentrate prices have been estimated by industry consultant CRU for Baobab's premium product. CRU's pricing model refers to industry standard reference Moroccan  $32\% P_2O_5$  phosphate rock, corrected by three factors:

- Positive adjustment due to higher P<sub>2</sub>O<sub>5</sub> content (proportional adjustment).
- Positive adjustment for lower CaO  $\div$  P<sub>2</sub>O<sub>5</sub> ratio.
- Minor negative adjustment for MER ratio.

Events affecting the global phosphate rock supply-demand balance or adverse regulatory environment-driven changes could cause projected mid-term and long-term phosphate rock concentrate market prices to deviate from the estimated outlook as forecast by CRU, with potential impacts on the Project profitability.

### LOGISTICS

The distance between mine gate and Port of Dakar is approximately 140 km on the existing road network. The new Dakar to Touba sealed toll highway, opened in Q1, 2019, runs east - west approximately 15 km south of the mine site and is expected to reduce rotation times to port.

Contracted covered single trailer rear-tipping trucks with typical capacity of approximately 50 t have been used under the mine's actual operations to ship product to the Port of Dakar and to the domestic customer and are forecasted to be used in the expanded operation contemplated in this Study.





### **ENVIRONMENTAL, SOCIAL & GOVERNANCE**

Senegalese rules and regulations, as well as Equator principles, IFC Performance Standards for Environmental and Social Sustainability, and World Bank Group's Environmental, Health and Safety Directives have been incorporated into the existing Baobab Project. As confirmed in the Presidential decree awarding the Exploitation Permit to BMCC (Presidential decree n°2018-1840 dated 27 September 2018), BMCC holds a valid environmental license, fully compliant with the standards and rules enacted by the Senegalese environmental code, to run its operations in the expanded Exploitation Permit area. The Environmental, Social and Governance (ESG) management systems will be updated for the expanded scope of operations.

#### FUNDING

Avenira considers that there are reasonable grounds to believe that the requisite future funding to cover the estimated capital and working capital costs for development of the Project will be available when required. Such belief is established in particular on the following contributing factors.

- The technical and financial parameters detailed in the Study are highly robust and economically attractive.
- The Project is in Senegal, a stable jurisdiction suitably located for shipping phosphate rock concentrate to end markets, including Brazil and the USA. Such shipments (to India) have already taken place from the Small Mine operation.
- Product price projections and general market supply-demand mid- and long-term phosphate rock market outlook projections by CRU are favourable. Decision to invest and project funding will take place after completion of the BFS projected to conclude during Q4, 2019 (based on a Q2 BFS start), with improved phosphate market conditions expected by then, as reported in CRU's Outlook report,
- The release of this Study provides a platform for the Company to advance discussions with debt providers, equity investors, equipment leasing and off-takers. The Company has held multiple discussions with several parties regarding funding options. These parties and options include: debt providers such as development financial institutions (DFI), international commercial banks and local Senegalese or regional commercial banks; equity providers such as private equity funds; mining and other mobile equipment leasing; potential off-take parties.
- Avenira has the support of existing and new shareholders and the continued strong support from the major shareholders. This has been demonstrated with over A\$20M equity raised over the past 2 years.
- The Avenira Board has a strong track record in funding large mining and fertilizer projects.

The Company will continue to assess all possible funding options during the BFS period to determine the optimum financing solution. It should be noted no material or binding agreements for funding or product offtake have been signed at this time.

While Avenira believes that the project economics will lead to successful fund raising, such successful funding remains a key Baobab Phosphate Project development risk.

#### **ADDITIONAL WORK**

Further metallurgical test work will be required during BFS. This will include additional rod milling test-work for rod mill design and further fines generation input, attrition test-work to specify attrition cells design, flotation locked-cycle tests, magnetic separation test-work (scavenger step on the combined pebble and flotation concentrate stream, and Fe range extension) for wider process guarantees, additional filtration test-work to confirm concentrate dewatering filters design and dryer feed moisture levels. Ore feed to the processing plant needs to be further characterised in terms of particle size distribution and associated chemical analysis by size fraction.



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Additional work on the tailing storage facilities include physical characterisation of sand tailings and slimes tailings to confirm tailings density for detailed design, and geotechnical information (load bearing, ground conditions, etc.) needs to be confirmed for detailed foundations and terracing designs. TSF and SRSF permitting and regulatory requirements also need to be confirmed.

Other items that will need to be confirmed during the BFS include the projected cost to relocate the villages affected by the mining operation, the projected Owners Costs, including operational capability ramp-up costs, and the bulk power connection schedule. An IFC/Equator Principles gap analysis will better define any gaps that should be closed to fully meet such standards.

## **RISK MANAGEMENT**

Key risks identified during the FS Phase of the Project include a project execution risk linked to delays in receiving ancillary permits and licenses and a projected mining cost risk linked to the possible existence of internal waste lenses smaller than the 125 m x 125 m drilling and sampling grid dimensions which, if they exist, would result in waste mining impacting the production schedule. Mining costs and schedule would also be materially impacted should any harder pockets of material requiring blasting be found, in particular in the ore zone. Additional risks also include potential findings relative to the additional metallurgical, geometallurgical (characterisation and mapping of variability of metallurgical test work samples) and geotechnical test work deviating from assessments to date, which could lead in particular to a revision of the comminution circuits or to higher or lower projected  $P_2O_5$  recoveries and final phosphate rock concentrate grade.

While the Company has exported several full-vessel phosphate rock cargoes from the Port of Dakar during the Small Mine operation, thereby demonstrating truck and port logistics, and despite the projected additional export capability associated with the projected bulk port at Bargny-Sendou, port congestion could increase in the future, potentially burdening the Project with increased shipment costs due in particular to demurrage expenditures. Changing truck-freight or ocean-freight market conditions in the future could also result in spending on shipping logistics deviating from current projections.

# VALUE-ENGINEERING

The pre-BFS value-engineering study will consider several capital expenditures vs. operating cost trade-off opportunities, including power supply by a contracted Independent Power Provider instead of connecting to and purchasing from the national power grid (removal of 30 km-long grid-connection HT line from projected Project capital expenditure) and leasing the mining and other mobile equipment instead of purchasing such equipment outright.

The value-engineering study will also review in particular the general processing plant layout compactness, crushed-ore stockpiling requirements and stockpile design, comminution circuit and concentrate settling, filtration and drying schemes to identify potential streamlining and other capital cost-reduction options.

# **PROJECT IMPLEMENTATION**

The current mining schedule covers a period of  $\pm$  14 years, with initial mining development starting 8 months before delivery of first ore to the process plant.

# 1.2 PROJECT OPERATIONS

Key areas of activity during the March 2019 quarter are listed below.



#### Occupational Health and Safety

No medical treatment injury or lost-time injury during the quarter.

#### Mining & Processing

There was no crushing and processing of mined ore from the Run Of Mine material onsite during the quarter as the Company has been monitoring commissioning and evaluation tests of a modified contracted crushing and screening operation.

#### Bargny-Sendou Port

Construction of warehouses destined to be dedicated to phosphate rock exports, of main internal port traffic roads, of port administrative offices and of the port's finger pier are under way, with pier completion target by end of 2019.

#### Sales

There were no sales during the quarter.

### 2. NOVAPHOS, INC. (Avenira $\approx 7\%$ )

Avenira owns a minority position of approximately 7% of Novaphos Inc (formerly JDC Phosphate, Inc.) and has an exclusive license to utilise the Novaphos Improved Hard Process (formerly JDC Phosphate technology) in Senegal and Australia for an extended period of time.

During the first calendar quarter of 2019, building on recent achievements at its demonstration plant in Fort Meade, Florida, Novaphos made additional improvements to its technology, further enhancing its efficiency and reliability. The Novaphos technology is now achieving phosphate yields of about 80%. Acid quality also continues to improve, with impurities at about 2% of SPA-equivalent acid, with strong potential for further improvement at commercial scale.

Novaphos has initiated a process of engagement with major phosphate producers and engineering companies to fully commercialise the Novaphos technology.

Shareholders are encouraged to view the Novaphos website: http://jdcphosphate.com/

# 3. WONARAH PHOSPHATE PROJECT, Australia NT (Avenira 100%)

The Company has monitored the improving phosphate market conditions and Novaphos's progress towards validation at demonstration plant scale of their technology to produce super-phosphoric acid from lower grade feedstock with respect to progressing the Wonarah project and intends to commence a Scoping Study during the September quarter.





# 4. CORPORATE

## 4.1 FUNDING UPDATE

On 18 March 2019 the Company announced a funding plan update as follows.

### **Pre-Project Finance Funding**

Targeting Final Investment Decision (FID) during the first half of 2020, the Company estimates its funding needs up to FID and before full Project Finance at approximately A\$11M (US\$8M) to A\$14M (US\$10M). In order to secure enough runway to hold fundraising discussions with potential financing partners following the FS Announcement, the Company entered into convertible loans (the 'Bridge Loans') with its three major shareholders Agrifos Partners LLC, Tablo Corporation and Agrifields DMCC (each a 'Lender').

The aggregate funding amount made available to Avenira by the Bridge Loans is A\$1.25M (US\$0.9M), with the funds drawn down immediately.

The Bridge Loans have been entered into on the following terms:

- Maturity: 12 months after the drawdown date
- Interest: accrued at 10%
- Conversion: subject to Avenira obtaining shareholder approval, each Bridge Loan may be converted into fully-paid ordinary Avenira shares ('Shares') at any time by a Lender at the 15 trading days volume weighted average ASX Share price ('15-day VWAP') subject to a \$0.008 floor and a \$0.024 ceiling, or by Avenira, at the 15-day VWAP subject to a \$0.001 floor and a \$0.024 ceiling, at any time with the Lender's prior consent or during the month prior to maturity (subject to certain conditions).

Following the FS Announcement, Avenira is seeking additional funding, estimated at A\$11M (US\$8M) to A\$14M (US\$10M), to enable the Company to complete the value-engineering study and the BFS, move to FID, repay the unconverted Bridge Loans and have sufficient runway to raise a combination of debt and equity funds to build and commission the Project.

The Company intends to raise the targeted A\$11M (US\$8M) to A\$14M (US\$10M) amount in two or more stages starting April 2019, and to that effect the Company continues to have discussions with a number of private equity funds focused on mining and Africa, project financing groups and Avenira's shareholders.

### **Project Finance Funding**

Avenira plans to seek full Project Finance funding following BFS completion via a combination of debt and equity supported by off-take agreements to finance and implement the Project. Sourcing of this financing would position the position Avenira to proceed with FID and Project implementation.

Private equity funds, off-takers and other strategic investors, including the Company's existing shareholders, will be targeted to cornerstone the equity component. The Company has had multiple meetings and discussions with local and international banks and with development finance institutions regarding the debt component, among other finance sourcing avenues explored.

The total required Project Finance funding amount will include Project capital expenditure as well as operational capability ramp-up costs and working capital. The FS-estimated capital expenditure, before revision during the value-engineering study and confirmation during the BFS, is detailed in the FS Announcement.





# 4.2 BOARD AND EXECUTIVE UPDATES

Non-Executive Director Mr Ian McCubbing retired from the Board on 31 January 2019 due to increasing personal commitments and other board roles. Mr McCubbing served as Chairman of the Audit and Risk committee as well as a member of the Remuneration and Nomination committee.

The Avenira Board has commenced a search for new independent directors.

# 4.3 CASH POSITION

At the end of the March 2019 Quarter, Avenira had a cash balance of \$1.3 million.





#### Schedule of Avenira Limited Tenements as at 31 March 2019

Location	Tenement Name	Tenement	Nature of Company's Interest
Northern Territory	Arruwurra	EL29840	100%
Northern Territory	Wonarah	EL29841	100%
Northern Territory	Dalmore	EL29849	100%
Northern Territory	Central Wonarah	EL31477	100%
Senegal	Baobab	014015/MIM/DMG	80%
Senegal	Gadde Bissik	2018-1840	80%

#### **Compliance Statement**

Information in this report relating to Exploration Results or estimates of Mineral Resources or Ore Reserves has been extracted from the reports listed below. The reports are available to be viewed on the company website at: *www.avenira.com* 

#### Baobab Project:

27 April 2015: Minemakers to acquire a potential near-term production rock phosphate project in the Republic of Senegal 11 May 2015: Minemakers delivers maiden Inferred Resource for Baobab Rock Phosphate Project in Republic of Senegal 22 September 2015: Baobab project update

7 December 2015: Maiden Indicated Mineral Resource at Baobab Phosphate Project

21 January 2016: Technical Report Mineral Resource Estimation for the Gadde Bissik Phosphate Deposit, Republic of Senegal

28 October 2016: September 2016 Quarterly activities report

23 February 2017: Baobab exploration results update

2 March 2017: Significant increase to Indicated Mineral Resource at Baobab Phosphate Project.

9 June 2017: Company Update (Strategic Plan)

31 July 2017: June 2017 Quarterly Activities Report

11 September 2017: Baobab Exploration Results Update

12 October 2017: Mineral Resource increase at Baobab Phosphate Project

5 February 2018: Mineral Resource Increase at Baobab Phosphate Project

22 October 2018: Avenira receives Exploitation Permit for Baobab Phosphate Project

18 March 2019: Avenira delivers strong feasibility study for Expansion of Baobab Phosphate Project

#### Wonarah Project:

15 March 2013: Technical Report Mineral Resource Estimation for the Wonarah Phosphate Project, Northern Territory, Australia

30 April 2014: Quarterly activities report

The company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and, in the case of estimates of Mineral 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 been materially modified from the original market announcement.

#### **Cautionary Statement Regarding Forward-Looking Information**

All statements, trend analysis and other information contained in this document relative to markets for Avenira trends in resources, recoveries, production and anticipated expense levels, as well as other statements about anticipated future events or results constitute forward-looking statements. Forward-looking statements are often, but not always, identified by the use of words such as "seek", "anticipate", "believe", "plan", "estimate", "expect" and "intend" and statements that an event or result "may", "will", "should", "could" or "might" occur or be achieved and other similar expressions. Forward-looking statements are subject to business and economic risks and uncertainties and other factors that could cause actual results of operations to differ materially from those contained in the forward-looking statements. Forward-looking statements are based on estimates and opinions of management at the date the statements are made. Avenira does not undertake any obligation to update forward-looking statements even if circumstances or management's estimates or opinions should change. Investors should not place undue reliance on forward-looking statements.

ASX: AFV

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# **About Avenira Limited**

Avenira Limited (ASX: AEV) is a phosphate rock mining company with a vision to develop a portfolio of agricultural minerals and production assets that will build long term shareholder value by supplying to the world the agricultural nutrients critical to global food security.

Our flagship asset is the 80% owned Baobab Phosphate Project located in Senegal, West Africa. During the 2017 calendar year, the Company established its strategic plan for the Baobab Project, focused first on a redevelopment of Baobab's Gadde Bissik mine to bring it to a profitable operational higher level, and subsequently on implementing next-step investments towards its longer-term objective of downstream integration.



Phosphate Concentrate Production



Gadde Bissik Pit

Under the plan to redevelop the Baobab Phosphate Project the Company engaged engineering firm Hatch to conduct a conceptual study which delivered positive results detailed in the Company's announcement of 17 October 2017. Following the positive conceptual study and successful completion of its Entitlement Offer and Placement capital raising, the Company embarked on the next phases of its strategic plan, to include more detailed engineering work, approvals and financing, and the Company appointed Wood Group PLC as lead engineering consultants for the first phase of the feasibility study, which delivered strong results detailed in the Company announcement dated 18 March 2019.

The Company also owns approximately 7% interest in Novaphos Inc. (formerly known as JDCPhosphate, Inc.), a private company in the USA focused on the development of a potentially game-changing proprietary high-quality super-phosphoric acid production technology. Avenira has exclusive license rights to use the IHP in Australia and Senegal once commercially proven.

The Company's other asset is the 100% owned Wonarah Phosphate Project in the Northern Territory. The project forms part of the Company's long-term strategy and will be enabled by the IHP process. Wonarah is one of the largest known phosphate deposits in Australia.

For further information on the company please refer to the company's website at www.avenira.com.

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