



**ASTRON CORPORATION LIMITED**

**ARBN 154 924 553**

**Incorporated in Hong Kong, company number 1687414**

**Notice to the Australian Stock Exchange**

## **Production and Exploration Report**

**Quarter Ended 31 March 2021**

### **Donald Mineral Sands Project, Victoria**

#### **OVERVIEW**

Astron holds Retention Licences (RL) 2002 and 2003, Mining Licence (ML) 5532, as well as Exploration Licence 5186, in Victoria, Australia through its wholly-owned subsidiary Donald Mineral Sands Pty Ltd (DMS) (see Figure 1, Donald Project Tenement Map). In total, the licence areas encompass 506 square kilometres in western Victoria and includes the area of the proposed multi-stage Donald Mineral Sands Project which comprises the Donald mineral sands deposits (250 sq kms) and the Jackson deposits (177 sqkms). The Donald deposit area includes ML 5532, which is planned to encompass Stage 1 of the proposed mineral sands mining and processing operations. The total tenement holding contains a potential major source of supply of mineral sands zircon and titania products, with a significant rare earth element component. The combined mineral resource for the Donald Mineral Sands Project is 5.7 billion tonnes (bt) at 3.2% HM (refer ASX Release 7 April 2016). As stated in the ASX Release of 18 February 2021, the Ore Reserves are 602 million tonnes (mt) at 4.8%, which equates to an approximate, in-situ ore body of 28.9 mt of heavy minerals, comprised: 5.4 mt of zircon; 9.2 mt of ilmenite; 8 mt of higher titanium content products of rutile and leucoxene (Hi-Ti), as well as a significant rare earth element component of 491 thousand tonnes (kt).<sup>1</sup>

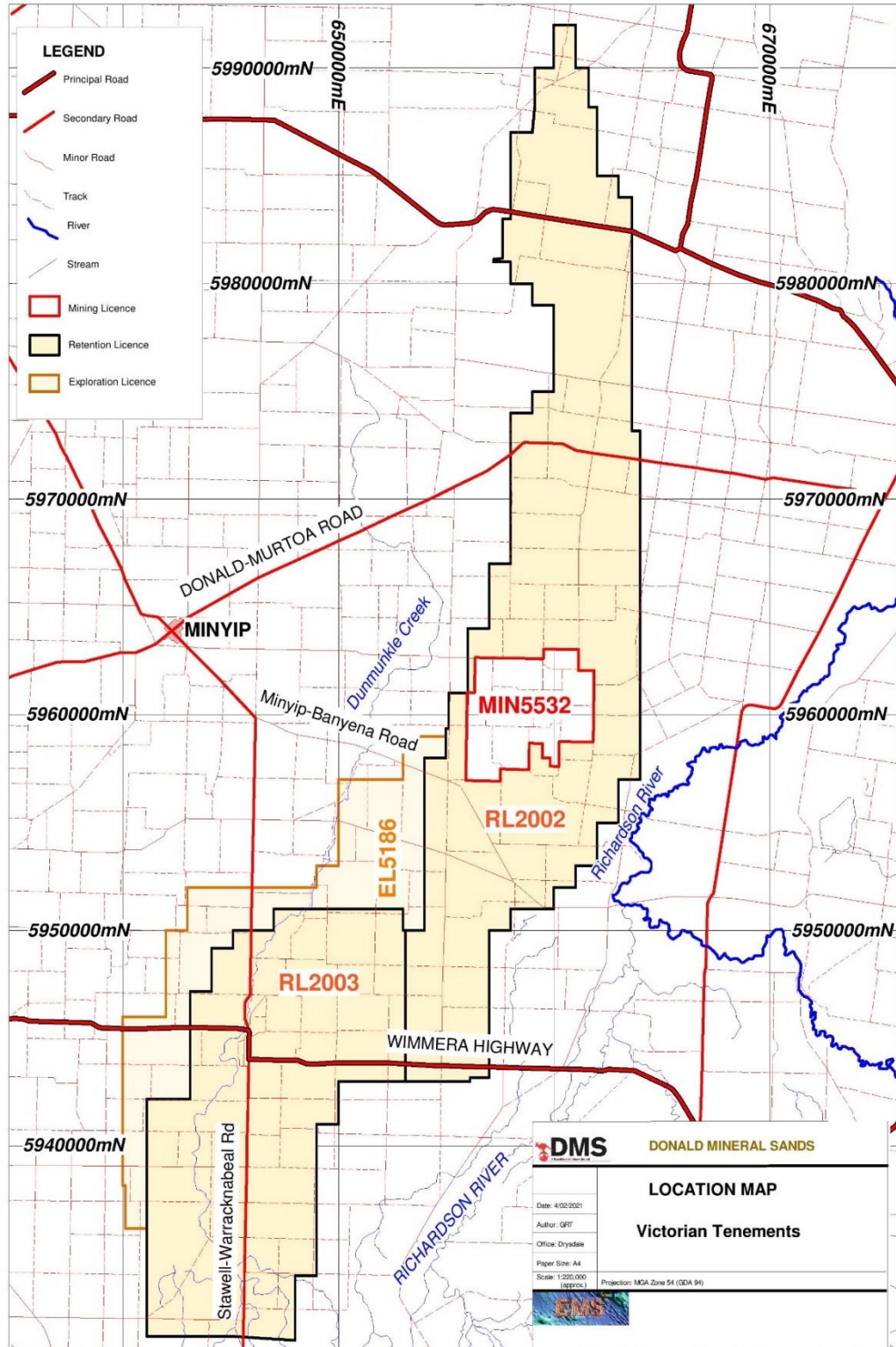
#### **DEVELOPMENT CONCEPT**

Astron is investigating a staged and scalable development approach to the Donald Minerals Sands Project. In this manner, capital expenditure can be phased, production levels can be determined based on an assessment of market conditions, while regulatory approvals for various stages can be progressively obtained. In total, current Ore Reserves, based only on the Donald deposit area (ML5532 and RL2002), are expected to support an operation of at least 40 years; representing a globally significant, sustainable new source of mineral sands and rare earths production.

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<sup>1</sup> See Astron's announcement "Donald Project Ore Reserves Statement Update" of 18 February 2021 for full details and notes.

**Figure 1 Donald Project Tenement Map**



Subject to completion of project concept selection and detailed engineering planning, development is planned initially through Stage 1 mining, concentrating and processing of heavy mineral ore from ML 5532 to produce final products of zircon and a blended titanium dioxide (titania) product, as well as a rare earth concentrate. Stage 1 operations are expected to access an estimated 194 mt of ore at 5.3% HM grade (including proved reserves of 170 mt at 5.3% HM and probable reserves of 24 mt at 4.9% HM. This represents 10.2 mt of HM and 1.95 mt of in-situ zircon. While production settings are subject to finalisation, indicative Stage 1 production is expected to be: ~120 kt of zircon per annum (of which ~80% of 95 ktpa is ~66% ZrO<sub>2</sub> premium grade product); 200ktpa of a blended (~60% TiO<sub>2</sub> titania product) and ~16ktpa of mixed rare earths concentrate (NdPr ~10%).

Astron has the main regulatory approvals (excepting a Work Plan), including an EES, for Stage 1, which allows for production for a period of ~8 years, based on the current mine plan. Current planning envisages a mineral processing facility at site, in comparison to previous plans to have heavy mineral concentrate exported for overseas production. Australian-based processing of final mineral sands products is expected to enhance the value of the project, as well as the employment, economic and social benefits to regional community as well as regional and Victorian state economies.

Stage 2 mining, concentrating and processing activities is planned to encompass the remaining area of RL 2002 and will be subject to securing the necessary regulatory approvals, as well as land access arrangements. Stage 2 encompasses Ore Reserves of 408 mt of ore at 4.8% HM, representing 18.4 mt of HM and 3.4 mt of in-situ zircon. Stage 2 has the potential to double Stage 1 production levels or sustain the operation for at least another 30 years.

The southern area of the resource, covered by RL 2003 (the Jackson deposit), is available for subsequent development.

## **MAIN WORK STREAMS**

The 2021 calendar year is expected to represent a material progression of extensive technical and market evaluation of the Donald Project, leading to a detailed feasibility study (DFS) and an investment case sufficient for project funding and board development approval. The main work streams in progress have included:

- Ore Reserve assessment and ore body characterisation, see ASX Release on 18 February, 2021;
- metallurgical test work and evaluation, see ASX Release on 30 March 2021;
- final project concept selection and design;
- definition of project management resourcing requirements necessary for both project planning and implementation, as well as the operational stage of the project;
- progression of further regulatory approvals, including necessary technical work for a Work Plan;
- product testing and sample product provision to customers to facilitate commercial off-take arrangements, including zircon product testing, see ASX Release on 7 April 2021

- initial engagement with existing and potential rare earth processors to determine avenues for the commercialisation of the comparatively low volume but high value rare earths component of the production stream; and
- continued community and stakeholder engagement.

These work streams will include consideration of necessary detailed evaluation works and associated funding requirements.

## PRODUCTION

As a project at an advanced evaluation stage, no commercial production activities were conducted during the quarter.

## DEVELOPMENT

During the quarter, the evaluation of the Donald project was advanced within the following main work streams.

### *Ore Reserves and Mineral Resources*

Astron issued an updated Ore Reserve Statement on 18 February 2021. This statement is updated from a 2012 Ore Reserve statement (refer ASX Release 18 June 2012) and a 2016 Mineral Resource Statement (refer ASX Release 7 April 2016). Table 1 below summarises the Ore Reserve and Mineral Resource information contained in this release. Ore Reserves increased by 31% relative to the 2012 Ore Reserve Statement.

**Table 1 Donald Mineral Sands Ore Reserve for RL 2002 at February 2021**

Classification	Tonnes (mt)	Slimes (%)	Oversize (%)	HM (%)	Ilmenite (%HM)	Leucoxene (%HM)	Rutile (%HM)	Zircon (%HM)	Monazite (%HM)
<b>Within ML5532</b>									
Proved	170	14.2	11.9	5.3	31.4	22.1	7.1	18.8	1.9
Probable	24	13.4	12.5	4.9	33.2	21.3	6.7	20.2	2.0
<b>Total</b>	<b>194</b>	<b>14.1</b>	<b>12.0</b>	<b>5.3</b>	<b>31.6</b>	<b>22.0</b>	<b>7.0</b>	<b>19.0</b>	<b>1.9</b>
<b>Within RL2002 Outside of ML5532</b>									
Proved	140	19.1	7.1	5.6	31.0	18.4	9.6	21.2	1.8
Probable	268	15.8	14.4	4.0	32.3	19.5	7.5	17.0	1.6
<b>Total</b>	<b>408</b>	<b>16.9</b>	<b>11.9</b>	<b>4.5</b>	<b>31.8</b>	<b>19.0</b>	<b>8.4</b>	<b>18.8</b>	<b>1.8</b>
<b>Total within Donald Deposit (RL2002)</b>									
Proved	310	16.4	9.8	5.4	31.2	20.4	8.2	19.9	1.8
Probable	292	15.6	14.2	4.1	32.4	19.7	7.4	17.3	1.6
<b>Total</b>	<b>602</b>	<b>16.0</b>	<b>11.9</b>	<b>4.8</b>	<b>31.7</b>	<b>20.1</b>	<b>7.9</b>	<b>18.8</b>	<b>1.7</b>

#### Note

1. The ore tonnes have been rounded to the nearest 1mt and grades have been rounded to one decimal place.
2. The Ore Reserve is based on indicated and Measured Mineral Resource contained with mine designs above an economic cut-off. The economic cut-off is defined as the value of the products less the cost of processing
3. Mining recovery and dilution have been applied to the figures above.

### ***Metallurgical Test Work***

Astron has undertaken pilot-scale concentrating of Donald ore into a heavy mineral concentrate (HMC) and the subsequent mineral separation or processing of this HMC into final products at consultants' test facilities. Mineral Technologies was commissioned to undertake the design, construction and operation of a pilot wet concentration plant to treat approximately 1,000 tonnes of ore, recovered from a test pit on RL2003, in order to produce a representative sample of heavy mineral concentrate (HMC) for further testing.

On 30 March 2021, Astron released to the ASX a detailed update on the results of its metallurgical test work (Refer ASX Release of 30 March 2021) The main findings included:

- High quality zircon final product with low impurities ( $\text{ZrO}_2 > 66\%$ ,  $\text{TiO}_2 < 0.15\%$ ,  $\text{Fe}_2\text{O}_3 < 0.1\%$ ,  $\text{Al}_2\text{O}_3 < 0.1\%$ ), recoveries of zircon final products up to 90.8% from HMC, of which >80% is assay proven to be of premium specification.
- Titania (titanium dioxide) product recoveries of up to 94.4% from HMC, with the potential to produce a 60%  $\text{TiO}_2$  blended concentrate.
- Confirmation of the ability to produce a high quality Rare Earth Elements (REE) concentrate from a froth flotation technique, with total REE of 51.2% with low impurity levels, at recoveries of up to 94.6% from HMC.
- Overall test results provide confidence in relation to the mineral separation process to be employed for final product separation of the finer, WIM-style materials, as well as confidence that commercial scale recovery of final products is achievable by the processes employed.

Based on the encouraging results from this separation test work, the concept for the Donald project now includes plans by Astron to produce final mineral sands products at site through the construction and operation of a mineral separation facility.

Current and planned metallurgical test work includes the following:

- Utilising the services of Mineral Technologies, further work to redesign and optimise concepts for the mineral separation stage of the process design to produce a higher grade HMC (entailing flotation of the rare earth elements and magnetic separation of ilmenite, and other elements); wet concentration plant and mineral separation plant design (involving electrostatic separation for zircon recovery from the titania product stream);
- completion of a design package for the planned operation of a pilot scale mineral separation plant processing HMC;
- larger scale flotation tests for recovery of rare earth elements; and
- further recovery of final product (zircon and titania) for customer product testing purposes, as well as potential samples of rare earth concentrate.

### ***Project Management Resourcing***

During the quarter, Astron undertook an exercise to identify critical project resources for the next stage of the evaluation of the Donald project. This included determination of the necessary resources as a foundation team for all aspects of project management through to the structure of a project group for detailed engineering, procurement and tenderer selection and project execution. Astron expects to commence the implementation of its critical resources acquisitions plan during the current quarter, which will entail retention of key consultants and additions to the current project team, thereby enhancing its existing internal organisational capabilities for the next stage of works for the commercialisation of the Donald resource.

### ***Zircon Product Quality Testing***

Subsequent to the end of the March quarter, Astron undertake the testing of Astron zircon at its own test facilities in China (refer ASX Release, Premium Zircon Test Results, 7 April 2021). The main findings included:

- Testing of Donald premium zircon determined that it rates favourably in terms of whiteness – a highly desirable characteristic for the main ceramics end use market – compared to tests also conducted on three competitor products; and
- Donald premium zircon, which is expected to constitute 80% of Stage 1 zircon production, will not require acid leaching to meet customer specifications.

The zircon quality results formed an important adjunct to the metallurgical test results and have enabled Astron to provide initial zircon product samples for testing and as part of the commencement of discussions with customers for potential off-take agreements.

As indicated, Astron has also commenced an initial process of identification and engagement with industry participants in the downstream rare earths sector, both in Australia and internationally, for the purpose of determining appropriate commercial arrangements for the sale of its planned rare earths concentrate stream. This work will form an important value component for the project, with the zircon and rare earth streams expected to constitute the major long term value elements of the project.

### ***Regulatory Approvals***

Regulatory approvals for the first stage of the planned development of the Donald Mineral Sands deposit on ML 5332 are well advanced. An outstanding regulatory approval is a Work Plan, for which the company intends to submit a detailed proposal during this year. During the March quarter, work continued on addressing the Environmental Effects Statement (EES) conditions for submission of the Work Plan, specifically as related to modelling of the air and noise parameters associated with the project.

Astron's consultant on regulatory approvals is working with company personnel to progress a package of matters for final regulatory approval, including those related to water and pipeline route; power facilities to

site and road infrastructure. Astron and its consultant also plans further engagement with regulatory authorities as part of its plan to now have final product separation undertaken at site. Astron's activities in this regard, as well as its efforts to commercialise the rare earth element product stream, are consistent with the Commonwealth Department of Industry, Innovation and Science's Critical Minerals Strategy which sets out to "enable the development of Australia's critical minerals sector, including downstream processing and manufacturing opportunities..."<sup>1</sup>

### ***Definitive Feasibility Study***

Conceptual design criteria for key infrastructure, including power, water, civil and road works, continues to be progressed to a design stage suitable for the tendering and awarding of infrastructure agreements after the commencement of the detailed engineering phase. Other aspects of the DFS is expected to include project optimisation, further market assessment and project financials.

### ***Test Pit Rehabilitation and Monitoring – RL2003***

Continued monitoring of the test pit, excavated during 2018, and subsequently rehabilitated back to the original land form, continues to be undertaken, including soil testing and crop yield data analysis by an agronomist.

### ***Community Consultation***

Associated with the increase in work activity and advancement of the project on several fronts, DMS intends to establish a Community Reference Group during the current quarter of 2021, as a means of ensuring a continuing high level of community engagement and means to seek the views of local residents and other stakeholders. The submission of a Work Plan will be associated with a process of engaging with residents and stakeholders.

### ***Funding***

Astron continues to consider and evaluate funding options for the Donald Mineral Sands Project. No specific actions were undertaken during the March quarter.

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<sup>1</sup> Australian Government, Department of Industry, Science, Energy and Resources website, accessed on 30 April 2021 at: <https://www.industry.gov.au/data-and-publications/australias-critical-minerals-strategy/our-vision-goals-and-actions>

## EXPENDITURE SUMMARY

**Total expenses incurred were:**

Production Activities	March Qtr 2021	YTD 2021 FY
	Nil	Nil
Development Activities	March Qtr 2021	YTD 2021 FY
	\$78,311	\$332,394

## **Niafarang Mineral Sands Project, Senegal**

### OVERVIEW

Astron Corporation owns a licence issued under Order Number 09042/MIM/TMG via its subsidiary Senegal Mineral Resources. (SMR).

The Niafarang project is located within an exploration licence zone covering an area of 397 square kilometres along a 75 kms stretch of the Casamance coast of Senegal, West Africa. The project is designed to access high-grade coastal mineral sands deposits using simple dredge mining and concentrating methodologies. The ore is high-grade coarse-grained sands producing high quality ilmenite and zircon.

Environmental and Mining licences were awarded in 2017. A small mining licence (SML) was initially awarded to Astron and transferred to its Senegalese based subsidiary. Mining operations will involve surface mining with little or no overburden, utilising conventional mining equipment as well as spiral wet concentration to produce a heavy mineral concentrate. Astron has acquired all of the necessary mining equipment for the first stage of the project. Extensive community and stakeholder engagement has occurred.

### PRODUCTION

As this project is still at a regulatory consultation stage defining the historical approvals already in place, there were no production activities during the quarter.

### DEVELOPMENT

Given the priorities associated with the Donald Mineral Sands Project, minimal activity was conducted during the March quarter in relation to the Niafarang project. Arrangements are still required to be finalised for the temporary resettlement of a small localised population, to allow the commencement of mining activities. Subject to completion of outstanding negotiations with the Government of the Republic of Senegal, production should be able to commence quickly, with a minimal capital expenditure requirement, although a timetable is not available for that occurrence at this stage.



## EXPENDITURE SUMMARY

### *Total expenses incurred:*

Production Activities	March Qtr 2021	YTD 2021 FY
	Nil	Nil
Development Activities	Dec Qtr 2021	YTD 2021 FY
	\$3,641	\$93,759

Note: the development activities expenditure includes procurement, design and consulting.

## **Astron China**

Astron Corporation, through its subsidiary Astron Titanium (Yingkou) Ltd, owns and operates a mineral sands processing plant in Yingkou, Liaoning, China.

## **MINERAL SEPARATION PLANT (MSP)**

Astron has also commissioned a titanium dioxide (TiO<sub>2</sub>) processing plant in Yingkou. During the March quarter, the plant produced 1,560 tonnes of rutile, and for the 9 months to 31 March 2021 it has produced 7,260 tonnes of rutile. The lower production is reflective of the period coinciding with the Chinese New Year period, and reflective of the decreasing feed grade of material for the Plant.

During the March quarter, Astron sold 2,514 tonnes of rutile into the Chinese market, principally for customers using the product for the pigment and welding rod markets and for the 9 months to 31 March 2021, 20,013 tonnes. The decrease in sales in comparison to previous periods reflects the current period coinciding with the Chinese New Year period. Astron expects the market conditions in China to remain favourable in the short to medium term.

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## **30 April 2021**

This announcement is authorised for release to ASX by the Board of Directors of Astron

## **About Astron**

Astron Corporation Limited (ATR: ASX) is an ASX listed company, with over 30 years' experience in mineral sands processing, technology and downstream product development, as well the marketing and sale of

zircon and titania (titanium dioxide) products, most notably in China. Astron conducts a mineral sands trading operation based in Shenyang, China and operates a zircon and titanium chemicals and metals research and development facility in Yingkou, China. The company's current prime focus is upon the development of the large, long-life and attractive zircon assemblage Donald Mineral Sands deposit in the Murray Basin, Victoria. Donald has the ability to represent a new major source of global supply in mineral sands. Astron is also the owner of the Niafarang mineral sands project in Senegal, West Africa. Niafarang is a high-grade coastal mineral sands deposit, planned to be developed using simple dredge mining and processing methodology.

#### COMPETENT PERSONS STATEMENT

The information in this report that relates to Exploration Results and Mineral Resources for the Donald Project is based on information first reported in previous ASX announcements by the Company, as listed in this announcement. 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 that all material assumptions and technical parameters underpinning the estimates in the original announcements continuing to apply and have not materially changed. The information in this document that relates to the estimation of the Mineral Resources is based on information compiled by Mr Rod Webster, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy and Australian Institute of Geoscientists. Mr Webster is a full-time employee of AMC Consultants Pty Ltd and is independent of Astron. Mr Webster has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. The Company confirms that the form and context in which the Competent Persons' findings are presented have not prematurely modified from the relevant original market announcement.

The information in this document that relates to the estimation of the Ore Reserves is based on information compiled by Mr Pier Federici, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy and Australian Institute of Geoscientists. Mr Federici is a full-time employee of AMC Consultants Pty Ltd and is independent of Astron. Mr Federici has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. The Company confirms that the form and context in which the Competent Persons' findings are presented have not prematurely modified from the relevant original market announcement.

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