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ASX Announcement
June 2023

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ASX ANNOUNCEMENT

PRE-FEASIBILITY STUDY UPDATE – METALLURGY

Testwork successfully yields high grade concentrates.

Highlights:

- Latest metallurgical testwork completed on optimised magnetic separation simulating designed processing conditions.
- High grade concentrates from **70% Fe** to **70.4% Fe** produced from fresh ore.
- High grade concentrates from **67.7% Fe** to **70.4% Fe** from weathered ore.
- Excellent recoveries achieved including:
  - **78.4%** to **79.7%** Fe from weathered ore and,
  - **79.8%** to **93.4%** from fresh ore

Athena Resources Limited ("**Athena**" or "**the Company**") (**ASX: AHN**) is pleased to provide an update on recently completed components of the Companies current pre-feasibility study ("FPS") on its 100% owned, Byro Magnetite Project (the Project"), situated in the Murchison Province of Western Australia. The PFS is part of our ongoing progression of the Project, which commenced early in 2023 with the completion of the updated Mineral Resource Estimate ("MRE"), from the 2022 drilling campaign.

ALS Metallurgy's Iron Ore Technical Centre ("IOTC") has recently completed Wet Low Intensity Magnetic Separation (Wet LIMS) testwork yielding highly encouraging results.

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GR Engineering Services Limited ("GRES") were commissioned by Athena to update the previously estimated capital and operating costs associated with the construction and operation of a 5Mt/a processing facility proposed for the Project. GRES were initially engaged in 2011 to carry out cost estimates and an operating flowsheet, which has largely been retained with some modifications and improvements.

Athena Resources is taking a measured approach to ensure the design will successfully deliver product at specification through optimisation of the key components including grinding and classification, Wet Low Intensity Magnetic Separation, plus the mass balance of concentrate and nonmagnetic rejects through the processing circuit.

Metallurgical Optimisation

The IOTC run metallurgical testwork was based on a substantial body of previous testwork, including the Davis Tube Recovery ("DTR") work, also completed by ALS Global IOTC, that was incorporated into the 2023 updated MRE.

The Company prepared bulk samples for a larger scale simulation to test the wet LIMS used within the process plant design. Comparing the bulk LIMS results against the previous LIMS and the large DTR dataset used for the design provides a clear indication of how successful the LIMS magnetic separation will be and gives a practical understanding of actual mass reporting to various stages of the concentrate grinding process or waste to tailings. The Flow diagram below shows the crucial stage of LIMS processing and significance of its effectiveness.

For the optimisation tests, samples were selected and composited from two HQ cored diamond drill holes, AHRC0107D, and AHRC0110D. These drill holes included both weathered and fresh composites situated within the open pit design and will be amongst the material designated for early treatment in the likely mining schedule. The samples were from a down-hole depth range of 23m to 163.2m (~140m vertical). Composites were tested by Wet LIMS with a feed of p80 of 106 microns, providing data on mass balance and grade at the final LIMS stage.

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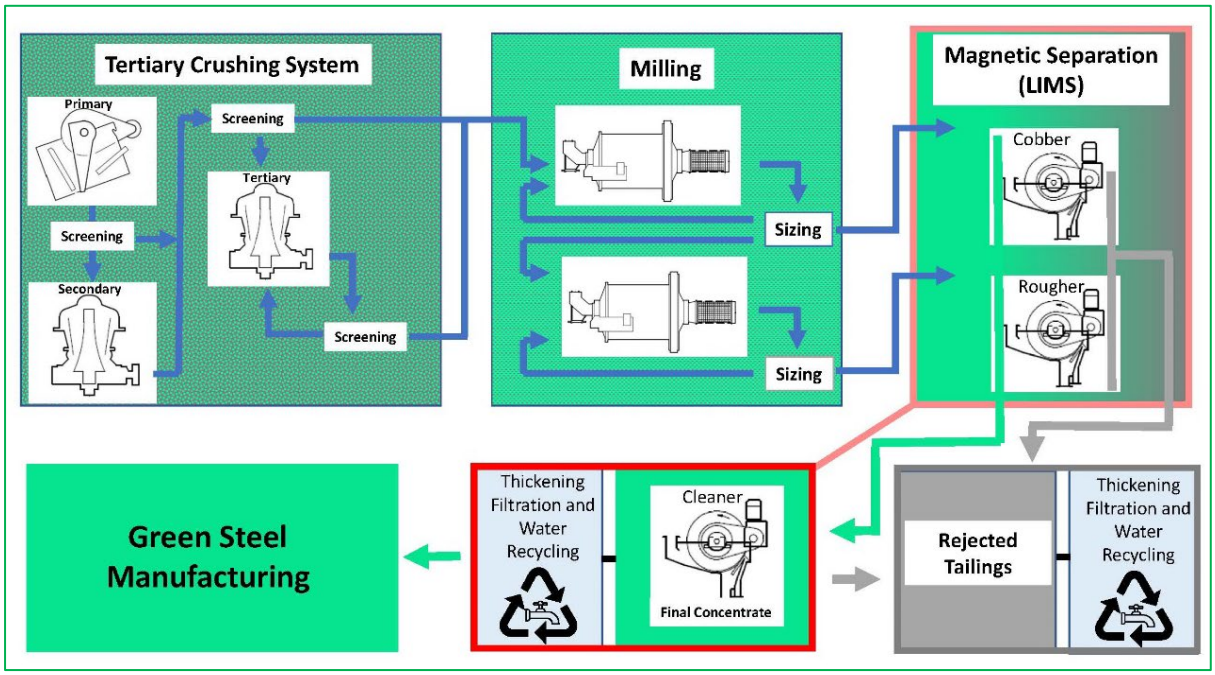

Figure 1. Wet LIMS circuits within the simplified process flow sheet.

Comparison between DTR and Wet LIMS

DTR test are typically used in magnetite programs to determine the initial weight-recovery of the magnetic iron. This is utilised to determine the proportion of the deposit that is magnetite, and to determine the likely grade of concentrate at a given grind size. Wet LIMS more closely resembles the magnetic separation used within the Process Plant designed by GRES. Comparison of the two processes gives a very good indication of how successful the magnetic separation will be in an operational setting.

DTR tests were conducted at a magnetic intensity of 3000G to yield close to the maximum results achievable for the concentrate Fe grade and Fe recovery. The laboratory Wet LIMS was conducted at 1100G, limited by the unit utilised for testing. The normal Gauss setting in a processing plant can range from 850G to 2000G or higher. Results show the design is robust and will achieve the high grade – low impurity product in the volume targeted.

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Figure 2. Wet LIMS magnetic separation plant simulation at IOTC Laboratories.

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Results from LIMS Optimisation

Table 1. Wet LIMS versus DTR results

Hole ID	Down-hold length	Method	Mag. Intensity	Grind	Conc. Fe %	Rec. Fe %	Wt Rec. %
AHRC0107D	70m from 77.0m	DTR	1,100G	106µm	70.1	90.8	39.3
	70m from 77.0m	Wet LIMS	3,000G	106µm	69.8	89.3	38.4
AHRC0110D	63.4m from 23m	DTR	1,100G	106µm	70.4	80.8	31.1
	63.4m from 23m	Wet LIMS	3,000G	106µm	70.1	79.8	30.3

Both the weathered and fresh composites were tested to determine if there was a variation in LIMS grade and recovery between two. The outcome of the LIMS is positive, confirming a production concentrate grade of 70%Fe for both ore types and the mass flow through the processing system is optimised. Table 2 below shows the ore type LIMS recoveries.

Table 2. Weathered versus Fresh Ore.

Hole ID	Intersection	Method	Ore Type	Grind	Conc. Fe %	Rec. Fe %	Wt Rec. %
AHRC0107D	21.8m from 77.0m	DTR	Weath.	106µm	68.4	81.3	30.1
	21.8m from 77.0m	Wet LIMS	Weath.	106µm	67.7	78.4	30.6
AHRC0107D	48.2m from 115m	DTR	Fresh	106µm	70.6	94.1	43.4
	48.2m from 115m	Wet LIMS	Fresh	106µm	70.4	93.4	41.9
AHRC0110D	13.5m from 23m	DTR	Weath.	106µm	70.3	77.9	33.6
	13.5m from 23m	Wet LIMS	Weath.	106µm	70.4	79.7	35.7
AHRC0110D	49.9m from 40.5m	DTR	Fresh	106µm	70.4	81.7	30.4
	49.9m from 40.5m	Wet LIMS	Fresh	106µm	70	79.8	28.8

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Next Steps

Athena expects to update the market at regular intervals on the completion of the key steps of the PFS, including processing and tailings, geotechnical study completion, open pit optimisation and mine scheduling, hydrology, power supply etc. In doing so, the Company is ensuring all modifying factors underpinning the project cater for the increased resource size, and high grade, low impurity magnetite concentrate from Byro. These latest results, with Wet LIMS concentrates over 70% confirm the process design with a final product to supply high purity "green steel" production and other premium industrial processes availably only to a concentrate of this purity.

This announcement is Authorised by the Board

Ed Edwards
Managing Director
19 June 2023

CAUTIONARY NOTES AND DISCLOSURES

Disclosures

All data and Information of material nature referred to within this Report with reference to the Byro FE1 ore body have previously been reported on the ASX platform in compliance with the relevant JORC compliance reporting format at the time of data acquisition.

Cautionary Notes and Forward Looking Statements

This announcement contains certain statements that may constitute "forward looking statements". Such statements are only predictions and are subject to inherent risks and uncertainties, which could cause actual values, results, performance achievements to differ materially from those expressed, implied, or projected in any forward-looking statements.

JORC Code Compliance Statement

Some of the information contained in this announcement is historic data that have not been updated to comply with the 2012 JORC Code. Some information referred to in the announcement was prepared and first disclosed under the JORC Code 2004 edition. It has not been updated since to comply with the JORC Code 2012 edition on the basis that the information has not materially changed since it was last reported.

Competent Persons Disclosure

Mr Kelly is an employee of Athena Resources and currently holds securities in the company.

Competent Person Statement

The information included in the report was compiled by Mr Liam Kelly, an employee of Athena Resources Limited. Mr Kelly has sufficient experience as a geologist in mining and exploration and is a Member of the Australasian Institute of Mining and Metallurgy, (#306501). Mr Kelly has sufficient relevant experience in the styles of mineralisation and deposit styles under consideration to qualify as a Competent Person as defined in "The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code 2012 Edition)". Mr Kelly consents to the inclusion of the information in the report in the context and format in which it appears.

INTERESTS IN MINING TENEMENTS

Athena Resources Limited 100%	Tenement Type
Byro Exploration	E – Exploration License
E09/1507	
E09/1552	
E09/1637	
E09/1781	
E09/1938	
Byro Project Mining	M - Mining Lease
M09/166	
M09/168	

JORC Code, 2012 Edition – Table 1

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.*	Core was selected from previously cut sections of two select drill holes. All details previously reported. (AHN:ASX Announcement 17/01/2023)
	• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*	All details previously reported. (AHN:ASX Announcement 17/01/2023)
	• *Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	All details previously reported. (AHN:ASX Announcement 17/01/2023)
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	HQ diamond drill holes
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.*	All details previously reported. (AHN:ASX Announcement 17/01/2023)
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.*	All details previously reported. (AHN:ASX Announcement 17/01/2023)
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.*	HQ diamond core has been quarter cut for.
	• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*	Samples considered to be of suitable quality and composition for the work carried out.

Criteria	JORC Code explanation	Commentary
	• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*	Metallurgical work, all samples used for purpose
	• *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.*	All details previously reported. (AHN:ASX Announcement 17/01/2023).
	• *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• All samples considered appropriate.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• The nominal DTR procedure used the following conditions: • Stroke Frequency 60/minute • Stroke length – 38mm • Magnetic field strength – 3000 gauss • Tube Angle – 45 degrees • Tube Diameter – 25mm • Water flow rate – 540ml/min • Washing time 10 minutes or until the water runs clear • Concentrate collected and assayed • Low Intensity Magnetic Separation (LIMS) was conducted at 1100 gauss on wet sample • The tailings sample not collected
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	Initial sample intervals were routinely 2m or less dependent on geology and mineralisation and are appropriate for the mineral resource estimation being considered. DTR composites were combined from sequential initial sample intervals DTR composites form up to 5m intervals.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*	*All details previously reported. (AHN:ASX Announcement 17/01/2023)*
	• *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	*All details previously reported. (AHN:ASX Announcement 17/01/2023)*
Sample security	• *The measures taken to ensure sample security.*	Chain of custody is being maintained from sample site to lab
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	No reviews of data management systems have been carried out

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.*	The tenement referred to in this report, M09/166 is 100% Athena owned and operated within native title determined claim WAD 6033/98, made on behalf of the Wajarri Yamatji People.
	• *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	The tenement is in good standing and no known impediments exist. See tenement listing attached.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties*	*All details previously reported. (AHN:ASX Announcement 17/01/2023)*
Geology	• *Deposit type, geological setting and style of mineralisation.*	*All details previously reported. (AHN:ASX Announcement 17/01/2023)*

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  • *easting and northing of the drill hole collar*
	  • *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  • *dip and azimuth of the hole*
	  • *down hole length and interception depth*
	  • *hole length.*
		Refer to body of text for collar location, elevation, dip, azi, and EoH for holes drilled.

	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	*No information has been excluded*
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.*	No weighting, min max, ave, truncation were used in this report. Whole rock feed assay grades reported from above a 10%Fe cut-off. DTR concentrate assay grades reported from above a 65%Fe cut-off.
	• *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.*	No metal equivalent are referred to in this report
	• *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	No metal equivalent are referred to in this report

Criteria	JORC Code explanation	Commentary
Relationship between mineralisation widths and intercept lengths	*These relationships are particularly important in the reporting of Exploration Results.*	
	• *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported*	There is no relationship to the geometry of mineralisation or drill hole angle.
	• *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	There is no relationship to the width or depth extent of the body only down hole length.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	All relevant data is tabulated within the body of the announcement.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	This report contains all meaningful results to date for whole rock feed assays grades above a 10%Fe cut-off. This report contains all meaningful results to date for DTR concentrate assay grades above a 65%Fe cut-off. Further assays are pending.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	This report contains all meaningful results to the completion of drilling. This report contains all meaningful results to date for whole rock feed assays grades above a 10%Fe cut-off. This report contains all meaningful results to date for DTR concentrate assay grades above a 65%Fe cut-off. Further assays are pending.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).*	Further metallurgical work will be undertaken to obtain definitive and conclusive data to be incorporated into the exploration database. If warranted further drilling will be undertaken to gain better understanding of the body shape, size and characteristic.
	• *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	Drilling information is not complete. Future drilling is commercially sensitive and is not included in this report.