Scoping Study confirms low-cost, scalable world-class REE project

American Rare Earths (ASX: ARR | OTCQX: ARRNF and AMRRY) **("ARR" or the "Company")** is pleased to announce the results of the "Halleck Creek Scoping Study Technical Report" **("Study")** compiled by Stantec Consulting Services Inc (Stantec - an independent engineering consulting firm). Located in the major mining hub of Wyoming, USA, the Halleck Creek project provides compelling economics and the ARR board has unanimously recommended the project advance to the next phase of development.

Cautionary Statements

ARR has published the study in its entirety on the Halleck Creek project tab at REEshore.com

The Study referred to in this announcement is a preliminary technical and economic study of the potential viability of the Halleck Creek Rare Earths project by developing a mine and constructing a beneficiation facility onsite and refinery facility offsite. The Study referred to in this announcement is based on lower-level technical and preliminary economic assessments and is insufficient to support estimation of Ore Reserves or to provide assurance of an economic development case at this stage, or certainty that the conclusions of the Study will be realised.

Approximately 85% of the Phase I initial production (20-year cash flow model) is in the Measured + Indicated Mineral Resource category and 15% is in the Inferred Mineral Resource Category. The inferred Mineral Resource is not the determining factor in determining the viability of the Halleck Creek Rare Earths project.

There is currently 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 other Measured or Indicated Mineral Resources or that the Production Target or preliminary economic assessment will be realised.

The Study is based on the material assumptions highlighted throughout this announcement. While the Company considers all the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the Study will be achieved.

These include assumptions about the availability of funding. To achieve the potential project development outcomes indicated in the Study, funding in the order of US$380 million + $76 million of contingency is needed (ARR presently has U.S. market capitalisation of approximately US$100 million). Investors should note that there is no certainty that the Company will be able to raise funding when needed, however the Company has concluded it has a reasonable basis for providing the forward-looking statements included in this announcement and believes that it will be able to fund the development of the project. This is based on an accepted ratio of initial capital expenditure to market capitalisation of 4.6 : 1 which includes 20% contingency.

It is also possible that such funding may only be available on terms that may be dilutive to, or otherwise affect the value of the Company's existing shares. It is also possible that the Company could pursue other strategies to provide alternative funding options. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Study.

Highlights:

- Under our base case 3Mtpa operating scenario, Scoping Study outlines NPV8 of US$673.9 and NPV10 of US$505.1m (pre-tax) at Halleck Creek, equating to an IRR of 22.5% and payback period of 2.9 years with total initial capex of US$456.1m (inc. US$76.0m contingency).

- LOM average Cost (USD/kg NdPr Equivalent) = $38.38/kg, which is favourable when compared to the most recently reported US$50/kg cash cost of NdPr by China Northern Rare Earths[1] – the world's largest integrated producer. A full breakdown of operating costs by product is illustrated in the Project Metrics table below.

- Low operating costs are attributable to favourable geology and mining economics, coupled with the beneficiation and concentration circuit (Density Separation and Wet High Intensity and Magnetic Separation (WHIMS), which provides a 10X upgrade in grade) along with good recovery/extraction via direct leaching, without the need for cracking. The recoveries are illustrated in the Project Metrics table below.

- The Study is based on an initial phase of 3.0 Million tonnes per annum (Mtpa) of mining to create a low capital cost for market entry and financing. A 6 Mtpa economic case was also prepared to illustrate future potential.

- The project had previously evaluated mining cases of 15, 10, 7 and 5 Mtpa before settling on this 3Mtpa mining case; making the project uniquely scalable over time, given the vast resource base (540 Mt total that were modeled in scoping exercise to identify grade for mine sequencing: 180 years at 3Mtpa and 90 years at 6Mtpa).

- The Study was designed to include separation of individual rare earth products in Wyoming, avoiding sending a concentrate overseas and includes all capital costs to separate products (sorted by revenue % attributable). The products include the heavy rare earths Terbium and Dysprosium as separated products, contributing 30% of revenue:

  - 66%: Neodymium (Nd)/Praseodymium (Pr) Oxide also referred to as "Didy"
  - 16%: Dysprosium Oxide (Dy)
  - 14%: Terbium Oxide (Tb)
  - 2%: Samarium (Sm), Europium (Eu), Gadolinium (Gd) "SEG" concentrate
  - 2% : Lanthanum (La) Carbonate

- The mine plan averaged an in-situ grade of 3,805 ppm TREO, the entirety of the cash flow presented (20+ years) is limited to approximately 400 acres on Wyoming state lands, which provides a very compact footprint. The planned design allows future optionality and enhances project economics by accelerating permitting and leveraging established infrastructure in later stages.

- Late in 2023 the US Treasury Department released a proposed rule f*or the Advanced Manufacturing Production Tax Credit, part of the Inflation Reduction Act (IRA),* better known as 45X. This production tax credit, equal to 10 percent of the costs incurred by the producing taxpayer, seeks to incentivise the domestic production of, among other things, critical minerals, including rare earths. The Study has applied this 10 percent tax credit to costs incurred during the project's production process, with certain exclusions as detailed in the full report.

- A long-term price of US$91/kg of NdPr was used based on consensus estimates from leading investment banks along with those for Tb and Dy. Various sensitivity analyses are provided in this summary.

[1] https://news.metal.com/newscontent/102656189/China-Northern-Rare-Earth-(Group)-High-Tech-cut-March-rare-earth-listing-prices%C2%A0/

Project Metrics

The study is a preliminary assessment based on Class 5 Association for the Advancement of Cost Engineering (AACE) compliant cost development +/- 25-35% and includes a contingency factor of 20%.

Project	Unit	Value
Phase 1 Mine Plan	Yrs	20+
Processing Run-of-Mine (ROM)	Mtpa	3.0
Total Production	Mt	64,263,399
Construction Period	Yr	2.5

Capital Expenditures	Unit	Value
Initial Mine Capital	USD	5.4 m
Initial Processing Capital	USD	374.7 m
Contingency (20%)	USD	76 m
Total Initial Capital	USD	456.1 m

Operating Costs	Unit	Value
NdPr Oxide	USD$/kg	38.38
Tb Oxide	USD$/kg	632.56
Dy Oxide	USD$/kg	168.68
SEG Concentrate	USD$/kg	4.22
La	USD$/kg	0.84
Total	USD$/kg	25.66

Pricing	Unit	Value
NdPr Oxide	USD$/kg	91.00
Tb Oxide	USD$/kg	1,500.00
Dy Oxide	USD$/kg	400.00
SEG Concentrate	USD$/kg	10.00
La	USD$/kg	2.00
Total		60.85

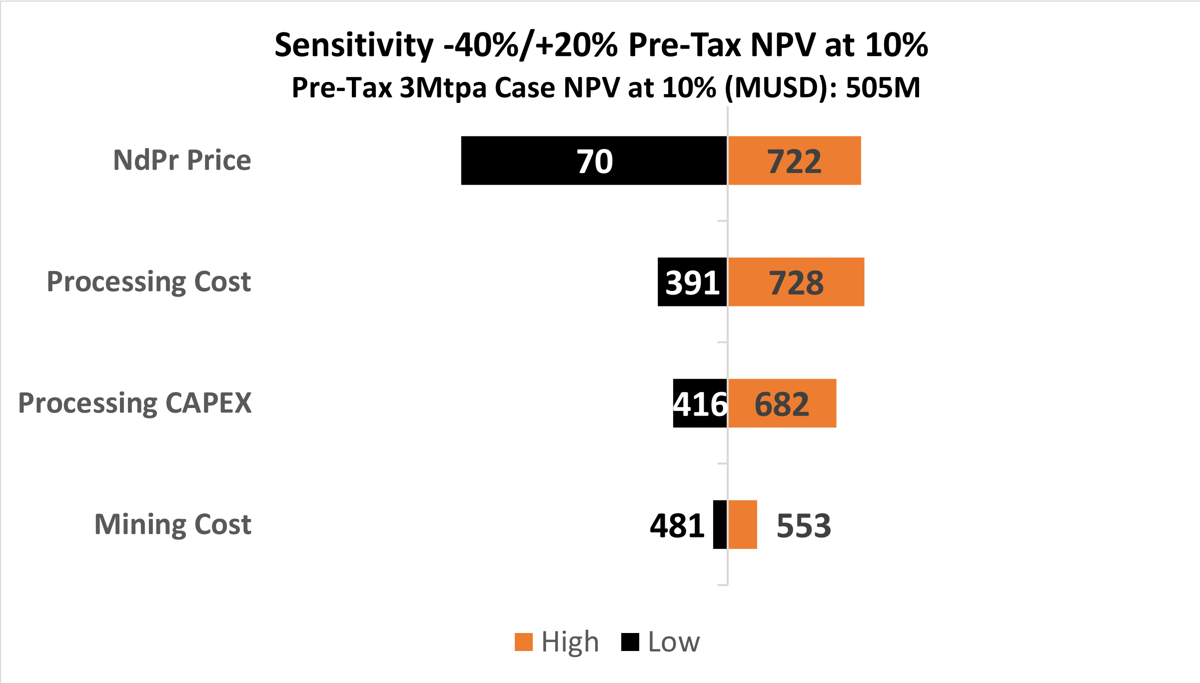
Before Tax Financials	Unit	Value
Free Cash Flow	USD	2,081.1 m
NPV	at 8%	673.9 m
NPV	at 10%	505.1 m
IRR (%)	%	22.5
Payback Period	Yr	2.9

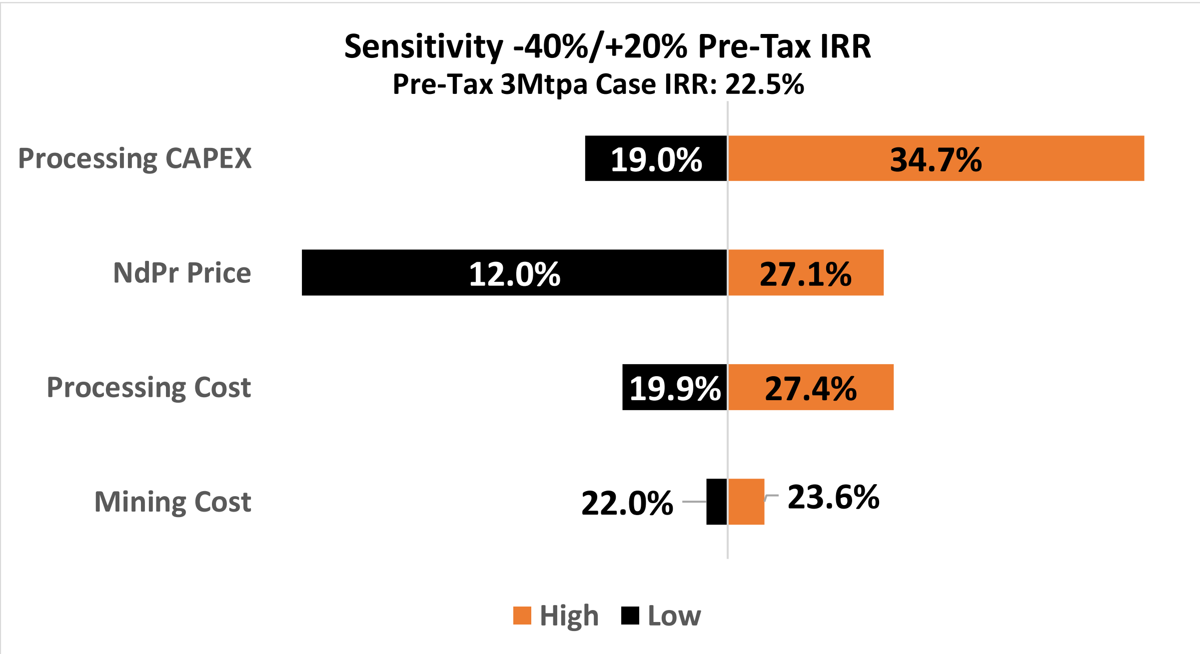
Recovery	Unit	Value
NdPr	%	63.9%
Tb	%	70.2%
Dy	%	66.5%
SEG	%	70.1%
La	%	68.6%

After Tax Financials	Unit	Value
Free Cash Flow	USD	1,845.1 m
Federal & State Taxes Paid	USD	(236 m)
NPV	at 8%	582.2 m
NPV	at 10%	430 m
IRR (%)	%	21
Payback Period	Yrs	3.1

Annual production (average)	Unit	Value
NdPr Oxide	mt	1,529
Tb Oxide	mt	17
Dy Oxide	mt	91
SEG Concentrate	mt	383
La Carbonate	mt	1,486
Total	mt	3,506

Sensitivities of Base Case 3 Mtpa





- As illustrated above, the project is most sensitive to Processing Capital and NdPr prices.
- At currently depressed spot prices ($54.60/kg) for NdPr, the project still provides a 12% IRR at 10% discount factor, further illustrating the potential of the project as a low-cost producer. We note these prices are not sustainable given current prices are at the cash costs of China Northern Rare Earths.
- Stantec completed a high-level comparison of a 6.0 Mtpa alternative production rate and compared to the Base Case of 3.0 Mtpa to investigate the upside of the property in the case that a higher demand for rare earths is realised. A mine life of 20 years was kept constant and

supported by a design targeting the best grade within the required tonnage within the Cowboy State Mine. Operating and capital costs were factored for the higher production rate. The 6.0 Mtpa scenario has a superior NPV at all discount rates. Future planned prefeasibility study will assess the annual production rate options. At a 10% discount factor, a 24% IRR was achieved at $920MM NPV. The Company believes there is additional upside in contiguous claims at higher grade that will be evaluated in further phases of study as this sensitivity was limited to just the Cowboy State Mine area.

Low-Cost Open-Pit Mining in a Favourable Mining Jurisdiction

- A strip ratio of 0.03 : 1
- Open-pit mining well suited to homogenous TREO grades.
- Substantial pre-existing infrastructure (BNSF and UP Tier 1 railroads, I-25 highway).
- Mining hub with availability of skilled labor given the decline of the local coal industry.
- Low-cost power ($0.0349 per kWh).
- Cowboy State Mine designed on Wyoming State Mineral Leases
    - The Wyoming Department of Environmental Quality ("WDEQ") has rigorous and comprehensive, yet well-defined processes for obtaining mining permits on state lands.
- Thorium and Uranium, and associated daughter products, occur in low levels in-situ naturally at Halleck Creek, approximately 68 ppm in the mineralised material.

Rare Earth Element ("REE") Bearing Allanite can be concentrated 10X using conventional technology

- Up to 86% of Allanite shown to be liberated from in-situ rock mass during crushing and grinding.
- Up to 93% of non-REE gangue material can be separated from the coarse REE bearing allanite.
- Physical separation methods shown to increase grade by approximately 10X with an 84% recovery of TREO.
    - In-Situ TREO grades between 3,500ppm and 4,000ppm increased to 35,000ppm (3.5%) to 40,000 (4.0%).
    - Gravity and Dense Media Separation removes between 77% and 83% of gangue material from ore material.
    - WHIMS can separate another 7% to 10% of non-magnetic material from paramagnetic material.
    - Metamict structure observed in SEM micrographs of the non-refractory allanite.
        - Metamictization causes allanite to become amorphous and amenable to acid leaching (requires less aggressive techniques).

Favourable Direct Leaching Kinetics

- REE recoveries up to 87% observed when using sulfuric acid at 90ºC for 6 hours.
    - 90ºC is relatively low temperature for acid-leaching processes.
- Low temperatures and shorter residence times reduce the production of silica gel.
    - Silica gel contaminates process streams and increases precipitation and filtration costs.
- High-temperature Acid baking not needed to "crack" allanite, compared with others that must heat temperatures to 1,000 ºC.
    - This affords the project a significant ESG advantage moving forward that will be quantified in future phases of work.

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American Rare Earths CEO, Donald Swartz, commented on the results:

"The work presented herein is a culmination of several years of hard work that highlights the potential of Halleck Creek to be the next world-class REE project. The study has revealed a truly elegant solution, as its simplicity unlocks the potential to decouple Western supply chains from Chinese oligopolies. The favourable geology combined with conventional technology, low-operating expenses, modest initial capital expenditures, associated with an expedited path to production have converged to offer a project that is compelling – even when compared against the heavily subsidised Chinese state-owned entities. As the Western downstream industries for rare earths are being advanced from a nascent stage, we have right-sized the initial phase of development to produce a reasonable amount of separated rare earths, within a project area which is highly scalable over time. This is a project that could yield transparent pricing, provide reliable supply, and allow the U.S. to REEshore this industry."

The study was completed with the expertise of highly experienced and reputable independent engineering consulting firms: Stantec, Tetra Tech and Odessa Resources.

Competent Person(s) Statement:

This work was reviewed and approved for release by Mr. Kelton Smith (Society of Mining Engineers #4227309RM) who is employed by Tetra Tech and has sufficient experience which is relevant to the processing, separation, metallurgical testing and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 JORC Code. Mr. Smith is an experienced technical manager with a degree in Chemical engineering, operations management, and engineering management. He has held several senior engineering management roles at rare earth companies (Molycorp and NioCorp) as well as ample rare earth experience as an industry consultant. Mr. Smith consents to the inclusion in the report of the matters based upon the information in the form and context in which it appears.

This work was reviewed and approved for release by Mr. Gordon Sobering (Society of Mining Engineers #4061917RM) who is employed by Stantec and has sufficient experience which is relevant to the mining plan and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 JORC Code. Gordon is a Professional Engineer and has 35 years of experience in the minerals industry including senior positions with Barrick, Newmont Mining, Goldcorp Inc., Doe Run, Energy Fuels Resources and ASARCO. Mr. Sobering consents to the inclusion in the report of the matters based upon the information in the form and context in which it appears.

The information in this document is based on information compiled by personnel under the direction of Mr. Dwight Kinnes who is Chief Technical Officer of American Rare Earths. This geological work was reviewed and approved for release by Mr. Kinnes (Society of Mining Engineers #4063295RM) who is employed by American Rare Earths and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 JORC Code. Mr. Kinnes consents to the inclusion in the report of the matters based upon the information in the form and context in which it appears.

This release was authorised for release by the Chairman of American Rare Earths Limited.

American Rare Earths (ASX: ARR | OTCQX: ARRNF and AMRRY) owns the Halleck Creek, WY and La Paz, AZ rare earth deposits. The Company's flagship project at Halleck Creek, WY, has the potential to become the largest and most sustainable rare earth projects in North America. American Rare Earths is developing environmentally friendly and cost-effective extraction and processing methods to meet the rapidly increasing demand for resources essential to the clean energy transition and US national security. The Company continues to evaluate other exploration opportunities and is collaborating with US Government-supported R&D to develop efficient processing and separation techniques of rare earth elements.

EXECUTIVE SUMMARY

Introduction

American Rare Earths Ltd. (ARR) has engaged Stantec Consulting Services Inc. (Stantec) to conduct a scoping study under the Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code or JORC) standards for the Halleck Creek Rare Earth Deposit, located in Albany County and Platte County, Wyoming. Halleck Creek is in the Central Laramie Mountains, approximately 70 km northeast of Laramie and 30 km southwest of Wheatland, Wyoming. The Halleck Creek project (the “project”) is composed of the Cowboy State Mine in the Company’s southern land holdings and the Overton Mountain Resource area in the north.

American Rare Earths, Limited (ASX: ARR, OTCQB: ARRNF) (ARR or the Company), through its wholly-owned subsidiary Wyoming Rare (USA) Inc has performed detailed exploration mapping, surface sampling, and exploration drilling at Halleck Creek to develop mineable rare earth elements. Plans include beginning baseline hydrological and environmental studies to start the permitting process.

ARR provided Stantec with previous work on mineral resources, and metallurgy completed by Odessa Resources and Wood (Pty).

This scoping study is a preliminary assessment based on a low accuracy technical and economic assessments (Class 5 AACE +/- 25-35% and includes a contingency factor of 20%).

Conclusions

Wyoming is a mining friendly state with a good base of skilled labor from the oil and gas and mining industries, both on the technical and operational side. The Cowboy State Mine resides on state mineral leases fully controlled by ARR; mining is straightforward and will be performed by open pit methods using conventional rubber-tired trucks and front-end loaders and supported by basic mine site infrastructure consisting of a waste dump, tailings impoundment, line power and a natural gas line and prefabricated buildings.

Processing will begin at the mine site with comminution, and mineral separation producing a concentrate which will be trucked on state and federal highways to refining facilities probably near Wheatland Wyoming. The refining facility will perform leaching, impurity removal and solvent extraction to produce payable rare earth metal oxides, specifically NdPr, La, Dy, Tb and SEG (mixed samarium europium and gadolinium). Tailings will likely be hauled back to the mine site using the same fleet of trucks.

Project capital and operating costs are based on Stantec’s and Tetra Tech’s prior experience on mine and mill operations of this size and scale. Tetra Tech, Inc. is an American consulting and engineering services firm that provides consulting, engineering, program management, and construction management services in the areas of water, environment, infrastructure, resource management, energy, and international development. Tetra Tech’s scope of work included all mineral processing including tailings storage facilities for the project.

Economics for the project are robust, due in part to the large scale of resources, which occurs at surface with a very low strip ratio (0.03). The project is easily scalable due to the modest production rate assumed in this report and can respond to increased market demand for rare earth metals. Likewise, a modular approach to refining allows for expansion as demand increases.

Capital and Operating Cost Estimates

The scoping study for the Cowboy State Mine is based on an annual mining and processing rate of 3.0 Mtpa for a period of 20-years (Table A). It is important to note, that due to the extensive mineralisation at the site, and low strip ratio, Stantec has shown mining could occur over 150 years based on the resource estimates, at the current planned production rate and using current economics. A preproduction construction schedule of 2.5 years has been assumed and total mill feed processed is 63.2 Mt.

Stantec based capital and operating costs for a 3.0 Mtpa open pit mining operation from the appropriate cost model from Costmine's Mining Cost Service. Based on Stantec's mining experience, these costs were applied to the mine design and conditions at Halleck Creek and are appropriate at this level of study. Stantec also calculated infrastructure costs based on site specifics and costs from Costmine's Mining Cost Service. Stantec assumed constant 2023 US dollars, metal pricing, recoveries and costs as stated in the specific sections of this report.

Process capital estimates were provided by Tetra Tech and considered infrastructure, equipment, and field costs assuming a portion of processing facilities will be located at Cowboy State Mine with the remainder located near Wheatland. Tetra Tech used an analogous rare earth processing project as the basis for this cost estimate.

Economic Analysis

Cautionary Statement: Stantec is not aware of any other specific risks or uncertainties that might significantly affect the Mineral Resource or the consequent economic analysis. Estimation of costs and rare earth prices for the purposes of the economic analysis over the life of mine production is by its nature forward-looking and subject to various risks and uncertainties. No forward-looking statement can be guaranteed, and actual future results may vary materially.

An economic analysis was performed by Stantec using the assumptions presented in this technical report. The Halleck Creek base case cash flow is preliminary in nature and based on Measured, Indicated, and Inferred Mineral Resources (Figure A and Figure B).

Table A: Summary of Costs and Economic Metrics

Project	Unit	Value
Phase 1 Mine Plan	Yrs	20+
Processing Run-of-Mine (ROM)	Mtpa	3.0
Total Production	Mt	64,263,399
Construction Period	Yr	2.5

Capital Expenditures	Unit	Value
Initial Mine Capital	USD	5.4 m
Initial Processing Capital	USD	374.7 m
Contingency (20%)	USD	76 m
Total Initial Capital	USD	456.1 m

Operating Costs	Unit	Value
NdPr Oxide	USD$/kg	38.38
Tb Oxide	USD$/kg	632.56
Dy Oxide	USD$/kg	168.68
SEG Concentrate	USD$/kg	4.22
La	USD$/kg	0.84
Total	USD$/kg	25.66

Pricing	Unit	Value
NdPr Oxide	USD$/kg	91.00
Tb Oxide	USD$/kg	1,500.00
Dy Oxide	USD$/kg	400.00
SEG Concentrate	USD$/kg	10.00
La	USD$/kg	2.00
Total		60.85

Before Tax Financials	Unit	Value
Free Cash Flow	USD	2,081.1 m
NPV	at 8%	673.9 m
NPV	at 10%	505.1 m
IRR (%)	%	22.5
Payback Period	Yr	2.9

Recovery	Unit	Value
NdPr	%	63.9%
Tb	%	70.2%
Dy	%	66.5%
SEG	%	70.1%
La	%	68.6%

After Tax Financials	Unit	Value
Free Cash Flow	USD	1,845.1 m
Federal & State Taxes Paid	USD	(236 m)
NPV	at 8%	582.2 m
NPV	at 10%	430 m
IRR (%)	%	21
Payback Period	Yrs	3.1

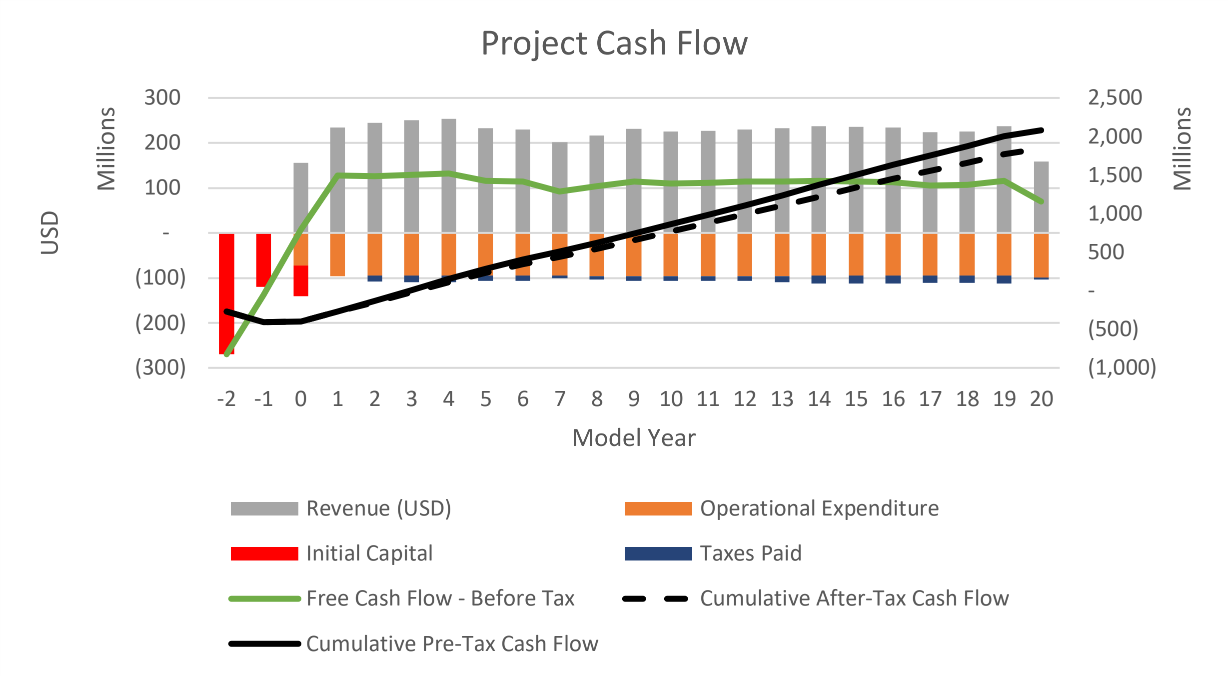
Annual production (average)	Unit	Value
NdPr Oxide	mt	1,529
Tb Oxide	mt	17
Dy Oxide	mt	91
SEG Concentrate	mt	383
La Carbonate	mt	1,486
Total	mt	3,506

Stantec assessed Halleck Creek to be subject to four separate royalties and a federal income tax and pays no state income tax. Total income taxes paid over the life of the mine are $236 M.

As part of the tax treatment, the economic evaluation includes a production tax credit, known as the *Advanced Manufacturing Production Tax Credit, part of the Inflation Reduction Act (IRA),* better known as 45X. The production tax credit is equal to 10% of the costs incurred by critical minerals producers, including rare earth producers. The tax credit is applied to processing processes with exclusions for mining, chemical reagents. Future modifications may include mining and chemical reagent costs be added to the IRA.

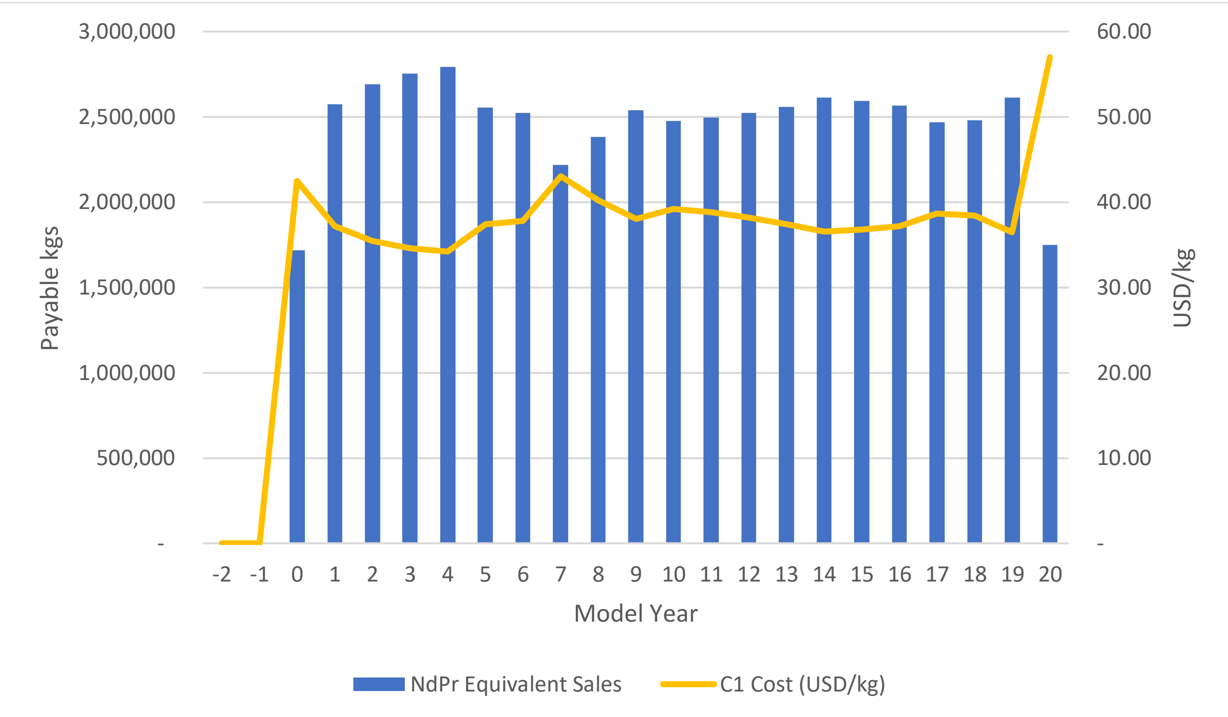
Royalties applied to the economics of the project include a Wyoming State Royalty, a severance tax, an Albany County ad valorem tax, and an industrial property tax. Total royalties paid over the life of mine equal $193.7 M.

Figure A: Project Cash Flow



The mining production schedule currently being considered generates the production profile of equivalent NdPr Sales with a C1 cost as shown in Figure B.

Figure B: Production Profile



Stantec completed an alternative schedule to evaluate a higher, 6 Mtpa, production rate, factoring mining and milling OPEX and CAPEX with associated downstream economics. Results of the alternative scenario yielded better NPV and IRR when compared to the 3 Mtpa base case. A comparison between the two cases is shown in Table C.

Table C: Production Scenario Summary

LOM Mining Stats	3.0 Mtpa Base Case	6.0 Mtpa Alt. Case
Total Ore Mined (Mt)	62.3	124.5
Total Waste Mined (Mt)	1.9	2.9
Total Material Mined (Mt)	64.3	127.4
Strip Ratio	0.03	0.02
Recovered Rare Earths	**3.0 Mtpa Base Case**	**6.0 Mtpa Alt. Case**
La (Mkg)	32.1	56.7
NdPr (Mkg)	34.5	62.0
SEG (Mkg)	8.6	15.6
Tb (Mkg)	0.4	0.8
Dy (Mkg)	1.9	3.4
NdPr_Eq (Mkg)	51.9	92.5
NdPr_Eq (g/t)	832	743
LOM Cash Flow	**3.0 Mtpa Base Case**	**6.0 Mtpa Alt. Case**
Total Revenue (MUSD)	4,722	8,416
OPEX Mining (MUSD)	305	567
OPEX Milling (MUSD)	1,648	2,986
CAPEX Mining (MUSD)	7	10
CAPEX Milling (MUSD)	450	727
After Tax Metrics	**3.0 Mtpa Base Case**	**6.0 Mtpa Alt. Case**
Free Cash Flow (MUSD)	1,845	3,335
Federal & State Taxes Paid (MUSD)	236	411
NPV @ 8% (MUSD)	582	1,065
NPV @ 10% (MUSD)	430	795
IRR (%)	21.1%	22.3%
Payback Period	3.1 Yr	3.0 Yr

Sensitivity Analysis

Stantec evaluated sensitivities to price, mining cost, processing cost and processing capital. Ranges from 60% to 120% (-40% to +20%) were evaluated for each case. The after-tax cash flow sensitivities are shown in Figure C and Figure D for the 3 Mtpa base case, and Figure E and Figure F for the 6 Mtpa alternative case.

Figure C: 3 Mtpa Base Case – After-tax NPV

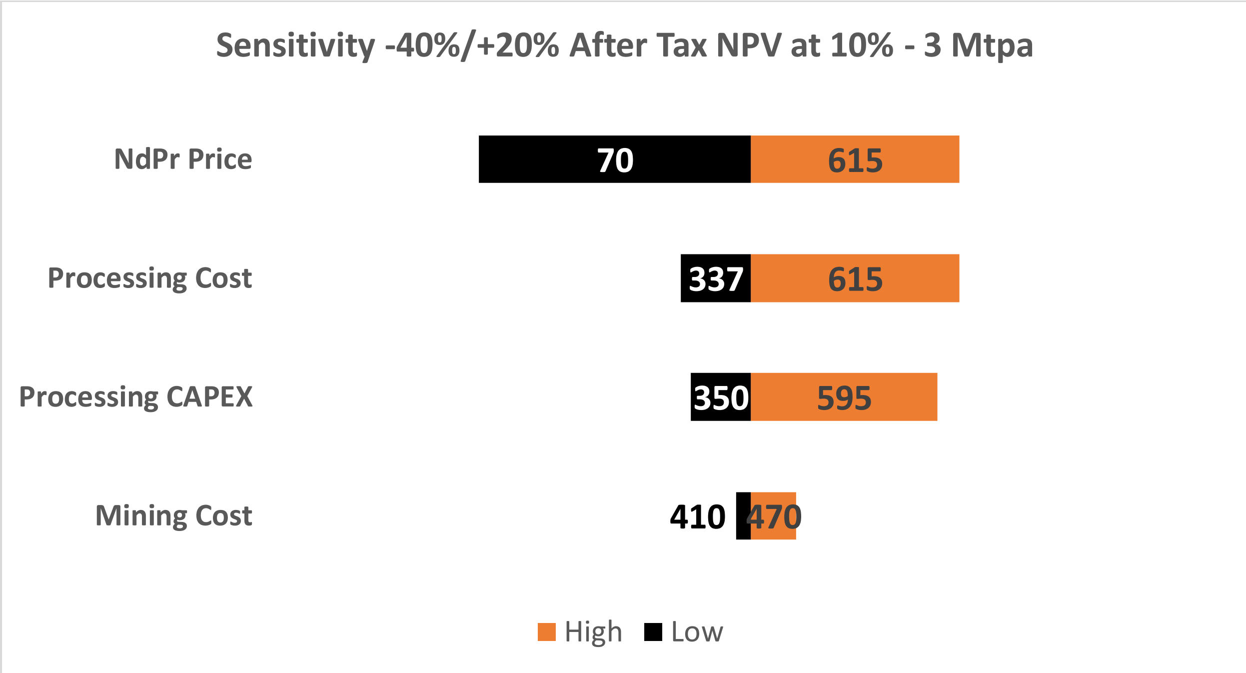


Figure D: 3 Mtpa Base Case – After-tax IRR

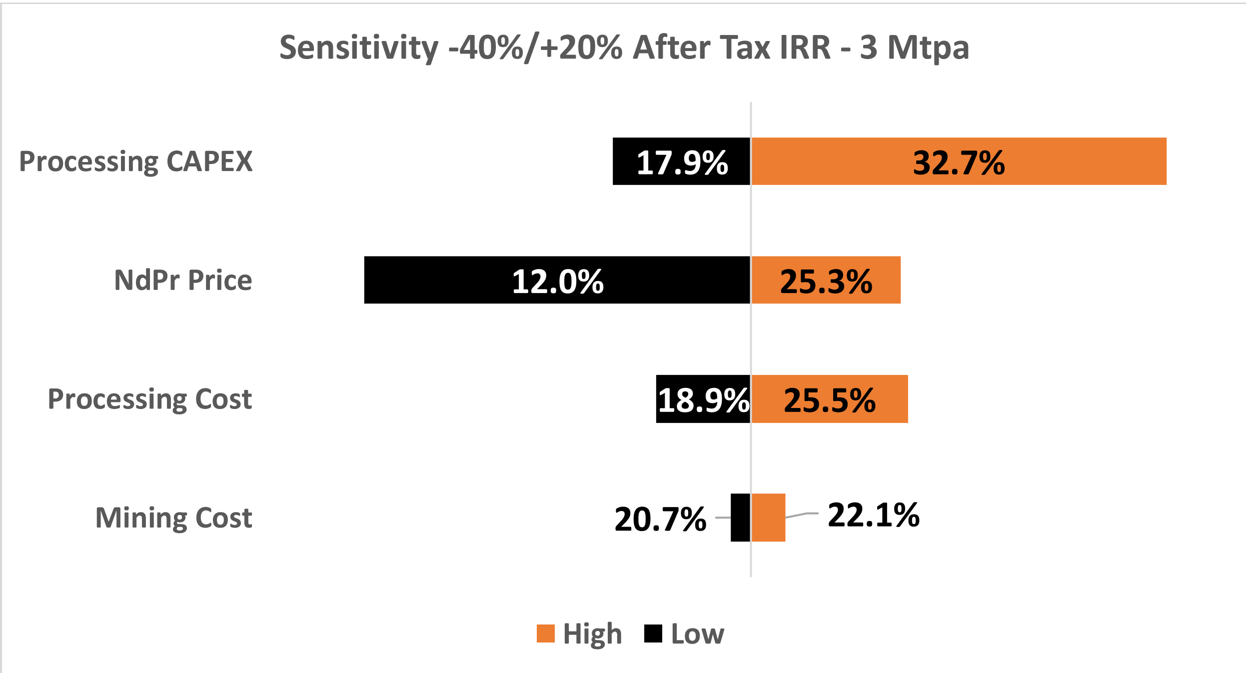


Figure E: 6 Mtpa Alternative Case – After-tax NPV

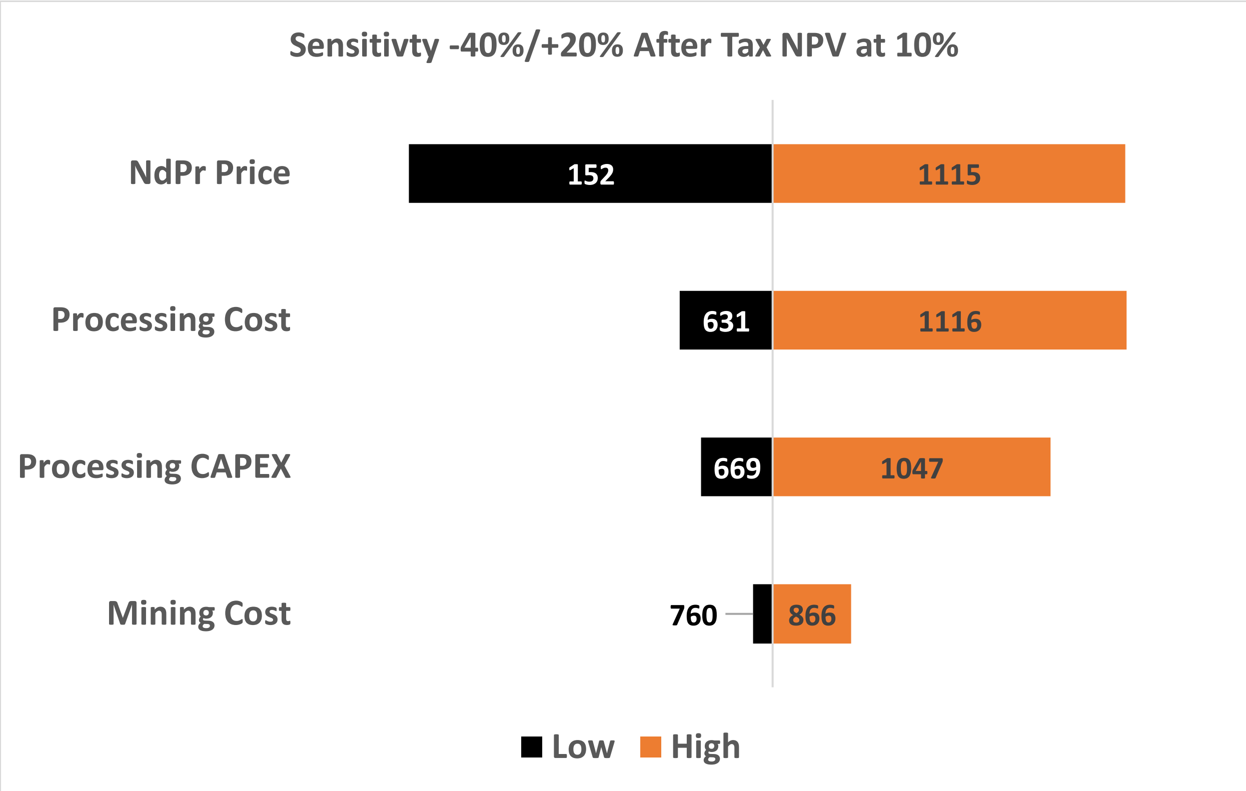
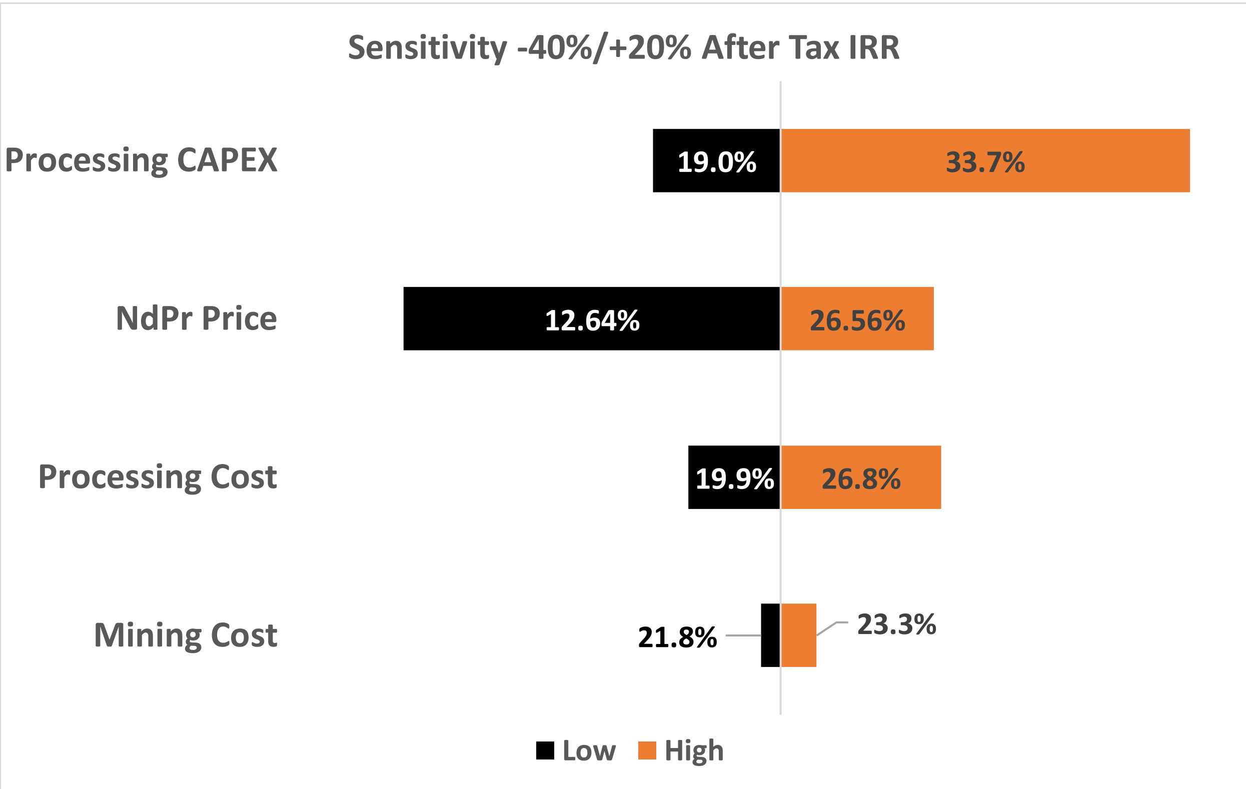


Figure F: 6 Mtpa Alternative Case – After-tax IRR



Terms of Reference

All measurements herein will be given in Metric system units (metres, metric tons, degrees centigrade, etc.) except where they are designated as Imperial units. All currency values are in United States Dollars except where specified otherwise.

Property Setting

The Project is in the Central Laramie Mountains, approximately 70 km northeast of Laramie, a sparsely populated area of Albany and the Platte Counties in southeastern Wyoming, USA.

Ownership

The Project is owned by Wyoming Rare (USA) Inc., a wholly owned subsidiary of ARR.

Mineral Tenure, Surface Rights, Water Rights, Royalties and Agreements

Through Wyoming Rare (USA) Inc., ARR controls 367 unpatented federal lode mining claims totaling 6,320 acres (2,558 ha) across the Halleck Creek Project area. ARR controls four Wyoming State Mineral Leases which total 1,844 acres (745 ha). Total mineral control held by ARR in the Halleck Creek district is 8,165 acres (3,304 ha).

Geology and Mineralisation

Halleck Creek resides in Red Mountain Pluton (RMP) as part of the 1.43 Ga Laramie anorthosite complex (LAC) in the Laramie Mountains, a Laramide aged uplift, in southeastern Wyoming.

Primary rare earth bearing rock types within the RMP consist of clinopyroxene quartz monzonite (CQM), and biotite-hornblende quartz syenite (BHS). Allanite is the primary rare earth element (REE) host mineral at the Halleck Creek Project. Allanite is a sorosilicate within the epidote group which contains a significant number of REEs in its primary mineral structure. Allanite usually occurs in association with clinopyroxene, hornblende, olivine and zircon agglomerated as “mafic clots” within CQM.

History and Exploration

During the 1950s uranium prospecting rush some rare earth elements (REE), thorium, and uranium occurrences were discovered in pegmatite bodies throughout the Laramie range. None of these were seriously explored (drilling, trenching, etc.) and apparently none locally mined.

In 2010 Blackfire Minerals, now defunct, acquired State mineral leases at Halleck Creek for REE exploration activities. In 2011 after initial sampling was completed, Blackfire dropped the state leases due to low REE prices.

In 2018, the project was re-activated by Zenith Minerals, Ltd. (Zenith), an Australian Mining Company who acquired the State leases formerly held by Blackfire. Zenith also staked 5 unpatented lode claims on federally owned land. ARR acquired the mining claims and state leases in 2020.

The Wyoming Office of State Lands and Investments assigned ARR the aforementioned Wyoming state mining leases in June 2021. From June 2021 through November 2022, ARR staked an additional 362 unpatented federal lode claims at Halleck Creek. Since the acquisition in 2020, ARE has expanded the land package to 8,164 acres (3,303 ha) across the Halleck Creek Project area.

Drilling and Sampling

Maiden exploration drilling at the Halleck Creek Resource Area during March and April of 2022 consisted of nine core holes, with five drilled on Overton Mountain and four on Red Mountain. Total length drilled resulted in 3,008 ft (917 m), and a total of 822 core samples were collected and sent to American Assay Labs, in Sparks Nevada for assay.

A larger reverse circulation (RC) exploration program from October to December 2022 consisted of 38 RC holes and a total length drilled of 5,574.5 m (18,292 ft). Eighteen holes were drilled on Red Mountain, and twenty were drilled on Overton Mountain. RC samples were collected at 1.5-metre intervals and sent to ALS Global for REE analysis.

During 2023, Company geologists conducted mapping and sampling in the County Line, Trail Creek, and Red Mountain prospect areas. Contemporaneous with the geologic mapping effort, ARR geologists collected 189 surface samples which were analysed using XRF and assayed by ALS global.

ARR conducted a reverse circulation and diamond core drilling program at the Halleck Creek Project during Q3 and Q4 of 2023. ARR completed a total of 15 RC holes with a total length drilled of 1,530 m (5,019.69 ft). ARR completed eight core holes to the depths shown below. One core hole was completed to a depth of 302 m (990.81 ft). All assay samples were sent to ALS Global for REE analysis.

Data Verification

Drill holes were sampled at 1.5 m (~5ft) intervals, with detailed samples collected at lithological breaks. ARR developed a strict QA/QC program using certified reference materials (CRM) from OREAS Labs for blanks and REE standards. Duplicate samples were also systematically inserted as sample assays.

The Qualified Person (QP) routinely verified geological data collection and analysis throughout the drilling and analytical programs. The QP reviewed geological descriptions against core photos and RC cuttings photos. The QP monitored analytical progress through ALS's online LIMS system. The QP prepared and reviewed striplogs of assay data and geologic data for each drill hole at Halleck Creek.

Metallurgical Testwork

Overview of Metallurgical Testing

In 2022 and 2023, Wood PCL in Perth, WA, Australia designed and supervised a metallurgical testwork program on behalf of ARR.

The testwork included the following:

- Hydrostatic testing of core to determine specific gravity (SG).
- Mineralogical Characterisation (performed by SGS Lakefield)
- Grinding, Comminution and Dewatering
- Flotation
- Leaching
- Wet High Intensity Magnetic Separation (WHIMS)
- Gravity Separation

Testwork by Subcontractors include the following:

- SGS Canada - Feed mineralogy analysis undertaken at SGS Montreal using their automated TIMA analyser on a separate sample to the master composite but geochemically similar.
- Nagrom – head analysis, comminution, and WHIMS
- Auralia Metallurgy – direct and reverse flotation testing on ore and WHIMS magnetics, sighter gravity separation, settling testwork.
- Watts and Fisher – pyrophosphoric acid leaching of sighter gravity concentrate and flotation concentrate.
- ALS – assessment of acid and alkali routes for processing WHIMS magnetics and flotation concentrate, mineralogy on WHIMS magnetics.
- Mineral Technologies – HLS and electrostatic separation on WHIMS magnetics
- Bureau Veritas – Falcon C series proxy testing of WHIMS magnetics.

In late 2023, ARR contracted with the University of Kentucky to perform additional magnetic and gravity separation piloting. The work focused on Heavy Liquid Separation (HLS) to simulate Dense Medium Separation (DMS) with the goal of concentrating the REE's before the leaching step.

Mineralogical Characterisation

SGS determined that allanite is the primary rare earth bearing mineral at Halleck Creek. Allanite makes up 1.31% of the total feed mass, with significant bias to the +212 micron fraction, indicating coarse crystal structure. The average grain size of allanite was 232 µm. Minor amounts of rare earth bearing minerals, zircon, chevkinite and tornebohmite, were also observed via TIMA-X electron microscopy and electron microprobe analyses. By contrast to allanite, chevkinite / tornebohmite averaged 42 µm in size, which require significantly more grinding to achieve liberation. Trace amounts of fluorocarbonate minerals bastnaesite and synchysite were also detected.

As beneficiation work progressed, additional mineralogical work was undertaken by Diamantina Mineralogy in Perth, Australia, who identified the amphibole mineral hastingsite, a member of the hornblende family. It was found that hastingsite was enriched along with allanite by the WHIMS process, followed by gravity separation and flotation. Chemical formulae and physical properties for each mineral is presented as follows:

- Allanite(Y): $(Y,Ce,Ca)_2(Al,Fe^3)3(SiO_4)^3(OH)$
- Hastingsite: $NaCa_2(Fe^2{}_4Fe^3)Si_6Al_2O_{22}(OH)_2$

Comminution

The combination of values suggest that Halleck Creek mineralisation should be suitable for processing in a SAG-Ball mill configuration without the need for pebble crushing; alternatively, the material could also be processed in a single stage SAG mill providing the target product size is not too fine, which is determined in primary WHIMS testwork. Additional testwork is needed to determine viability of HPGRs and VRMs grinding equipment in the process design. The coarse grain structure of the rare earth mineralisation coupled with low competency should translate to high unit capacities.

Gravity Separation

On behalf of ARR, the University of Kentucky (UK) conducted a series of Heavy Liquid Separation (HLS) tests to evaluate the use of DMS as a unit operation to concentrate the rare earth content in the mineralisation as well as rejecting a large portion of the rare earth mass. The results showed that more than 76% of gangue material can be rejected using a 2.7 SG cut. Furthermore, testwork showed that the TREO grade is increased by a factor of 3.8 with a TREO recovery of 87%.

Magnetic Separation

Wet high intensity magnetic separators (WHIMS) have shown to be effective in separation of rare earth minerals. WHIMS has been tested using Halleck Creek material by Zenith and by ARR.

Wood supervised a thorough WHIMS testing program using Halleck Creek core during the 2023 testing program. Primary WHIMS batch testing was conducted to determine basic responses of the rare earths using WHIMS. A secondary WHIMS program was tested using a continuous WHIMS unit to simulate plant conditions.

Passing first-stage 3,000 Gauss non-magnetic materials through the WHIMS unit at 6,000 Gauss saw spikes in the TREO + yttrium grade as well as recovery, which is a more predictable response and supports mineralogical findings of a high degree of allanite liberation. Cumulative recoveries became normalised in a narrow band of 87–91%.

For continuous WHIMS operation, 300 kg of mineralised material was ground to a P80 of 500 µm. The results showed that REO recovery was poor using only two stages of WHIMS. Wood included two additional scavenging stages to boost yield and recovery. However, overall TREO+Y recovery did not reach the levels achieved in batch testing.

Preliminary Leach Testing

Wood engaged ALS Global in Perth Australia to perform preliminary leaching testwork using Halleck

Creek WHIMS concentrate. Five methods were used for leach testing: Acid bake-water leach (ABWL), High Pressure Acid Leach (HPAL), Alkali bake-water leach-HCl leach, Sulfuric acid tank leach, and a proprietary process from Watts & Fisher. Leach testing showed determined that sulfuric acid tank leach testwork was the most effective process for the material. Solids for all tests were wet milled to a P_{80} size of 38 microns.

Wood sulfuric acid tank leaching tests showed by using 250 kg/t acid dosage at 90 °C for 12 hours that recoveries of 82.8% and 89.5% could be achieved for Nd and Pr, respectively.

Recovery Estimates

A combination of different DMS and WHIMS testing demonstrated overall TREO recoveries between 77% to 78%. Preliminary leaching results using WHIMS concentrate showed an overall TREO recovery of approximately 85%. Tetra Tech estimated the recovery for five potential rare earth products (Lanthanum carbonate, Nd/Pr oxide, SEG oxide concentrate, Tb oxide, and Dy oxide) as approximately 67% from ore to final product.

Deleterious Elements

Thorium and Uranium, and associated daughter products, occur naturally at Halleck Creek at low levels, approximately 68 ppm in the mineralised material. A conceptual impurity removal plant is designed to remove Th and U applying commonly used methods of a precipitation reaction, filtration, and ion exchange.

Iron (Fe^{++} and Fe^{+++}) occurs within allanite and hastingsite minerals. Fe_2O_3 occurs in allanite at 19.69%. Hastingsite typically contains 8.1% Fe_2O_3 but 29.0% FeO. Fe is removed during processing using conventional methods.

Mineral Resource Estimation

Estimation Methodology

Odessa Resources Ltd., from Perth Australia, updated the Halleck Creek resource model incorporating drilling data collected in late 2023 by ARR. Using all drill hole data, Odessa updated variograms and block model parameters. Grade estimation was carried out using an Ordinary Kriging (OK) interpolant.

A cut-off grade of 1,000 ppm Total Rare Earth Oxides (TREO) was used to estimate in situ resources. As part of Stantec's work, a net smelter return was calculated based on saleable rare earth element oxides: La_2O_3, Nd_2O_3, Pr_6O11, Sm_2O_3, Dy_2O_3, and Tb_4O_7. The net smelter return value demonstrates that a 1,000 ppm TREO cut-off grade meets the conditions for reporting of a Mineral Resource with reasonable prospects of eventual economic extraction.

Mineral Resource Statement

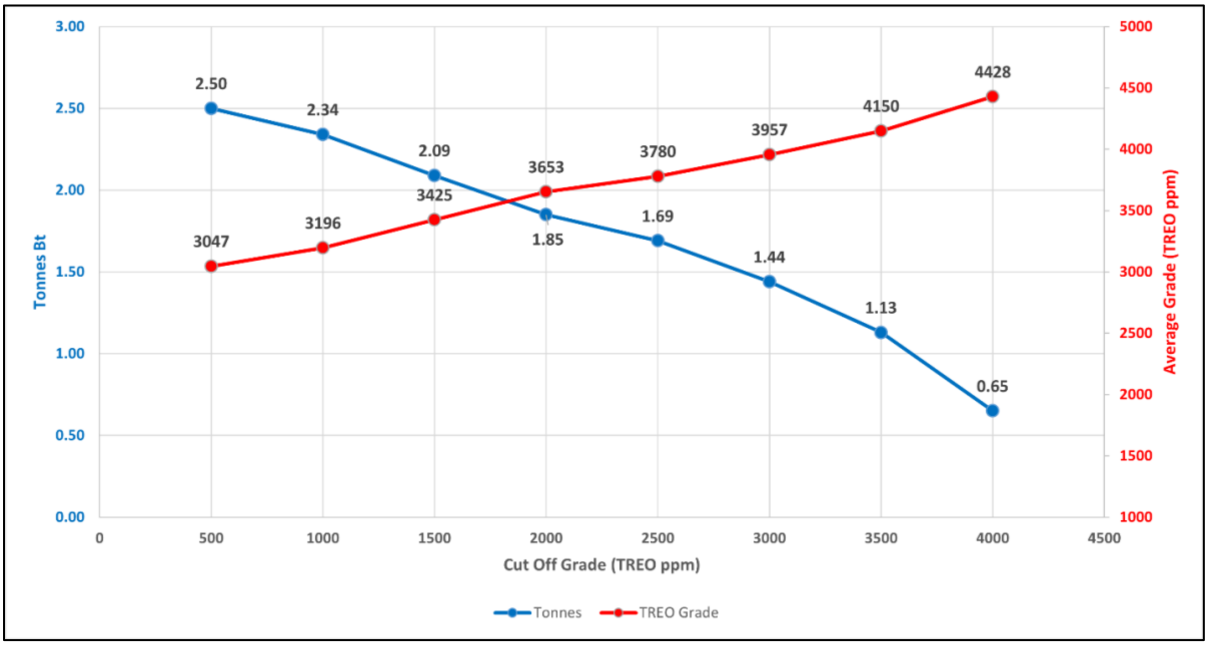
Using the 1,000 ppm TREO cut-off grade the estimated in situ resource estimate at Halleck Creek is 2.34 billion tonnes (Gt) with an average grade of 3,195 ppm (0.32%) TREO (Table D and Figure C). This is an increase of 64% in in situ tonnes compared to the March 2023 maiden resource estimate for Halleck Creek. The estimated average Magnet Rare Earth Oxide (MREO) comprises 24% of TREO. The total in situ measured and indicated resources at Halleck Creek are 1.4 Gt with an average TREO grade of 3,295 ppm (0.33%).

It should be clearly noted that Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resource will be converted into a Mineral Reserve. Areas where ARR does not control mineral resources have been excluded from resource estimates.

Table D: Estimated Rare Earth Resources at Halleck Creek (1000 ppm TREO cut-off)

Classification	Tonnage	*Grade*				*Contained Material*			
		TREO	LREO	HREO	MREO	TREO	LREO	HREO	MREO
	t	ppm	ppm	ppm	ppm	t	t	t	t
Measured	206,716,068	3,720	3,352	370	904	769,018	692,935	76,550	186,836
Indicated	1,210,173,301	3,223	2,838	349	780	3,899,931	3,434,947	422,124	943,421
Meas + Ind	**1,416,889,369**	**3,295**	**2,913**	**352**	**798**	**4,668,949**	**4,127,881**	**498,674**	**1,130,257**
Inferred	924,698,618	3,041	2,696	339	737	2,812,121	2,493,178	313,187	681,138
Total	**2,341,587,986**	**3,195**	**2,828**	**347**	**774**	**7,481,070**	**6,621,059**	**811,861**	**1,811,395**
Rounded	**2,342,000,000**	**3,195**	**2,828**	**347**	**774**	**7,481,000**	**6,621,000**	**812,000**	**1,811,000**

Figure C: Grade vs Tonnage Curve for Updated Halleck Creek Resource Estimate



ARR 2024

Between 2022 and 2023, total estimated resources increased by approximately 0.91 Gt (64%). The estimated TREO grade decreased by 133 ppm TREO (-3%). Measured + Indicated resource increased by 0.79 Gt (128%). Inferred resources increased by 0.18 Gt (15%).

Factors That May Affect the Mineral Resource Estimate

Factors which may affect the mineral resource estimates include the following.

- Metal price and currency exchange rate assumptions
- Changes to the assumptions used to generate the equivalent cut-off grade
- Changes in local interpretations of mineralisation geometry and continuity of mineralised zones
- Changes to geological and mineralisation shape
- Changes to geological and grade continuity assumptions
- Density and domain assignments
- Changes to geotechnical, mining, and metallurgical recovery assumptions
- Changes to the mining and processing input and design parameter assumptions
- Assumptions pertaining to site access, completion of proposed exploration programs, and maintaining the social license to operate.

Mineral Reserve Estimation

The Halleck Creek REE Project is still in the preliminary stages of exploration and development, and as such, no mineral reserves have been defined, calculated, or implied.

Mining Methods

Open pit mining at Halleck Creek will be done using the conventional rubber-tired and tracked diesel powered equipment at a steady state production rate of 3.0 Mtpa of mineralised material with an average strip ratio of 0.03. Open pits at the Cowboy State mine, near Red Mountain, and at the Overton Mountain resource areas were designed with 6 m high double benches with 3 m wide catch benches.

Recovery Methods

Recovery Process Summary

Conceptually, comminution and concentration will occur at the proposed mine site, followed by extraction, impurity removal, and rare earth separation at a second location, most likely near Wheatland, Wyoming.

The proposed Halleck Creek rare earth processing components consists of the following.

- Comminution Circuit - utilising High Pressure Grinding Rolls (HPGR).
- Concentration Circuit - using gravity or density separation and Wet High Intensity Magnetic Separation (WHIMS) to separate gangue from REE minerals.
- Extraction Circuit - Tank leaching of mixed rare earth concentrate using dilute sulfuric acid. Cerium is rejected by calcining prior to leaching.
- Impurity Removal Circuit - to remove Fe, Th, Al, and U, using a partial neutralisation precipitation and Ion Exchange (IX).
- Separation and Finishing Circuit – using Solvent Extraction (SX) to refine finished products.
- Associated plant infrastructure (wastewater treatment plant, tailings storage facility, etc.)

Production Capacity

The comminution circuit will be designed to process 3.0 Mtpa on a dry basis, or 9,132 metric tonnes per day (tpd) assuming a 90% uptime (329 days per year) of run of mine material. The concentration circuit will be designed to match the comminution circuit and process 3.0 Mtpa of REE material on a dry basis, or 9,132 tpd assuming a 90% uptime (329 days per year) of crushed REE material. The extraction circuit will be designed to process 231,945 tpa on a dry basis or 705 tpd on a dry basis assuming a 90% uptime (329 days per year) of concentrate. The impurity removal circuit will be designed to match output of the refinery, or 243 gpm of Pregnant Leach Solution (PLS). The separation and finishing circuit will be designed to match the output of the Impurity Removal circuit of 276 gpm of Uranium Removal discharge.

Estimated Products

Separation and Finishing will be designed to produce the following five finished products for sale with approximate average annual production rates:

1. Lanthanum (La) in the form of lanthanum carbonate or hydroxide – 1,486 tpa on a TREO basis
2. Neodymium/Praseodymium (Nd/Pr) Oxide (didy Oxide) – 1,529 tpa
3. SEG Oxide Concentrate – 383 tpa on a TREO basis
4. Terbium (Tb) Oxide – 17 tpa
5. Dysprosium (Dy) Oxide – 91 tpa

The product specifications will be developed in upcoming design work using computer simulations and laboratory testing.

Infrastructure

Locally, the Project will be supported out of Wheatland, Wyoming. Because the Project is in the early stages of development, mining-related infrastructure has yet to be constructed at the Site. Comminution and separation will occur at the mine site, while subsequent processing and refining will occur at a second location, most likely near Wheatland, Wyoming.

The infrastructure planned for this scoping study report includes access roads, fresh water wells, powerlines, buildings, temporary waste rock storage and tailings storage.

Environmental, Permitting and Social Considerations

ARR acquired exploration drilling notices from the WDEQ-LQD for all drilling activities performed to date.

ARR is developing a permitting needs assessment with local environmental consulting groups to present to each division at WDEQ to identify comprehensive environmental baseline studies needed to permit a mining operation at Halleck Creek.

At this stage of project development, no social impact studies have been completed.

Recommendations

Due to the level of detail and effort invested in this scoping study, a prefeasibility study should be realised in approximately 12 months based on the collection of additional data to support the permitting process, hydrology, geotechnical engineering, and geologic mapping including sampling. Mine engineering and further processing testwork is needed to better understand, design, and cost the Halleck Creek Project.

Geologic sampling and mapping s needed to determine extents of mineral resource and to identify additional high-grade areas, and to guide future exploration efforts at the Project. Infill drilling is recommended within the Cowboy State Mine area to increase resource classification, and to collect hydrological and geotechnical information to enhanced design parameters, engineering factors and associated economics at the prefeasibility level.

Bulk sampling and core drilling is needed to advance metallurgical testwork, specifically comminution and concentration testing. Comminution testing is recommended to define crushing and grinding processes featuring High-Pressure Grinding Rolls (HPGR) to identify particle size distribution, energy consumption and associated costs.

Concentrate testing is recommended to determine equipment required for primary gravity separation to validate mass balance and concentration efficiency. Gravity separation testing at specific gravities above and below 2.7 is recommended to remove less-dense gangue material from REEE ore which represents about 77% of the mineralised material.

Extensive extraction and refining testwork is recommended to define practical methods for leaching, possible calcining, impurity removal, and solvent extraction to produce specific rare earth oxides. These tests will determine base-case parameters (temperature, pH, residence time, molarity, etc.) and reagents (sulfuric acid, sodium hydroxide, etc.) for a future demonstration plant. The solvent extraction testing will begin with initial batch tests moving toward continuous testing when the quantity of feedstock allows. Solvent Extraction test parameters include feed acidity, separation coefficients, and settling time among others. Waste water streams need to be quantified and analysed to aid in the mass balance.

It is recommended that ARR begin developing permitting and baseline environmental needs in conjunction with regulatory agencies. It is also recommended that ARR develop a framework for community engagement while reaching out and understanding the community needs.

Appendix A – Halleck Creek JORC 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 (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as downhole gamma sondes, handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.*	ARR drilled 15 reverse circulation (RC) holes and eight HQ-sized diamond core holes between September and October 2023. All RC holes were 102 meters (334.65 feet) deep, with seven core holes at 80 meters (262.47 feet) and one deep core hole at 302 m (990.81 feet). RC chip samples were collected at a 1.5-meter (4.92 ft) continuous interval via rotary splitter. Rock core was divided into sample lengths of 1.5 m (4.92 feet) long and at key lithological breaks. ARR drilled 38 reverse circulation (RC) holes across the Halleck Creek Resource Claim area between October and December 2022. All holes were approximately 150 meters (492.13 feet) deep, with the exception of HC22-RM015 which went to a depth of 175.5 meters (576 feet). Chip samples were collected at 1.5-meter continuous intervals via rotary splitter. In March and April 2022, ARR drilled nine HQ-sized core holes across the Halleck Creek Resource claim area. All holes were approximately 350 ft with the exception of one hole which was terminated at 194 ft. Total drilled length of 3,008 ft (917 m). Rock core was divided into sample lengths of 5 ft (1.52 m) long and at key lithological breaks. A total of 734 surface rock samples exist in the Halleck Creek database. Surface rock samples collected by ARR are logged, photographed and located using handheld GPS units. As part of reverse circulation (RC) and diamond core exploration drilling at Halleck Creek, ARR collected XRF readings on RC chip and core samples. Elements included in XRF measurements include Lanthanum, Cerium, Neodymium, and Praseodymium. ARR collected three XRF readings on each sample, then averaged the readings. Readings are performed at 20-meter intervals down each drill hole. These values are qualitative in nature and provide only rough indications of grade.

Section 1 Sampling Techniques and Data		
(Criteria in this section apply to all succeeding sections.)		
Criteria	***JORC Code explanation***	***Commentary***
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	For the April 2022 core drilling program, core recoveries and RQDs were calculated by ARR field geologists. The same was done for the Fall 2023 program with the addition of detailed geotechnical logging.
	Aspects of the determination of mineralisation that are Material to the Public Report.	The Red Mountain Pluton (RMP) of the Halleck Creek Rare Earths Project is a distinctly layered monzonitic to syenitic body which exhibits significant and widespread REE enrichment. Enrichment is dependent on allanite abundance, a sorosilicate of the epidote group. Allanite occurs in all three units of the RMP, the clinopyroxene quartz monzonite, the biotite-hornblende quartz syenite, and the fayalite monzonite, in variable abundances.
	In cases where 'industry standard' work has been done, this would be relatively simple (e.g. '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 (e.g. submarine nodules) may warrant disclosure of detailed information.	Reverse circulation rock chip samples were collected at 1.5-meter continuous intervals via rotary splitter. For each interval chip samples were placed in labelled sample bags weighing between 1-2kg. A 0.5-1kg sample was collected for reserve analysis and logging. Chip samples were also placed into chip trays with 20 slots for logging and XRF analysis. Rock core samples 5 ft (1.52 m) long are fillet cut. The fillet cuts are being pulverised and sampled for 60 elements including rare earth elements using ICP-MS and industry standards. A select number of samples are additionally being assayed for whole rock geochemistry. American Assay Labs in Sparks, NV is performed the analyses for the Spring 2022 program, and ALS Laboratories in BC, Canada.
		RC chip samples were sent to ALS labs in Twin Falls, ID for preparation and forwarded on to ALS labs in Vancouver, BC for ICP-MS analysis. ALS analysis: ME-MS81. Core samples were first sent to ALS in Reno, NV, for cutting and preparation, and also sent to Vancouver, BC for the same suite of testwork.

Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Drilling Techniques	*Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or another type, whether the core is oriented and if so, by what method, etc.).*	A Schraam T-450 reverse circulation drill rig was used to drill all 15 RC drill holes from the Fall 2023 program. A continuous rotary sample splitter was used to collect the RC samples at 1.5m intervals. Total drilled depth of 3,011.81 ft (1,530 m). Core, fall 2023: HQ, diamond tip, 5 ft (1.52 m) runs, unoriented. Total drilled depth of 2,816.60 ft (858.5 m).
Drill Sample Recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.*	A continuous rotary sample splitter was used to collect the RC samples at 1.5m intervals. All drill core was visually logged, measured, and photographed by ARR geologists. Drill core was collected in lengths (runs) of 5 ft (1.52 m). Recoveries were calculated for each core run. Each rock sample was described, photographed with its location determined using handheld GPS.
	Measures are taken to maximise sample recovery and ensure the representative nature of the samples.	Reverse circulation rock chip samples were collected at 1.5-meter continuous intervals via rotary splitter. For each interval chip samples were placed in labelled sample bags weighing between 1-2kg. A 0.5-1kg sample was collected for reserve analysis and logging. Chip samples were also placed into chip trays with 20 slots for logging and XRF analysis. All core and associated samples were immediately placed in core boxes.
	Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	Recoveries were very high in competent rock. No loss or gain of grade or grade bias related to recovery

Section 1 Sampling Techniques and Data		
(Criteria in this section apply to all succeeding sections.)		
Criteria	***JORC Code explanation***	***Commentary***
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 RC samples were visually logged by ARR geologists from chip trays using 10x binocular microscopes. Samples at 25m intervals were photos and analysed using an Olympus Vanta handheld XRF analyser in triplicate. Lanthanum, Cerium, Neodymium, and Praseodymium were analysed via XRF. All drill core was visually logged, measured, and photographed by ARR geologists. Drill core was collected in lengths (runs) of 5 feet (1.52m). ARR geologists calculated recoveries for each core run. ARR geologists logged lithology, various types of alteration and mineralisation, fractures, fracture conditions, and RQD.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	RC samples and logging is quantitative in nature. Chip samples are stored in secure sample trays. Chip samples were photographed and 25m intervals. Core logging is quantitative in nature. All core was photographed.
	The total length and percentage of the relevant intersections logged.	All RC samples were visually logged by ARR geologists for each 1.5-meter continuous sample. All drill core was visually logged, measured, and photographed by ARR geologists. Drill core was collected in lengths (runs) of 5 feet (1.52m). ARR geologists calculated recoveries for each core run. ARR geologists logged lithology, various types of alteration and mineralisation, fractures, fracture conditions, and RQD.

Section 1 Sampling Techniques and Data		
(Criteria in this section apply to all succeeding sections.)		
Criteria	***JORC Code explanation***	***Commentary***
Sub-sampling techniques and sample preparation	*If core, whether cut or sawn and whether quarter, half or all core taken.*	RC chip samples were not cut. Drill core was fillet cut by ALS Laboratories with approximately 1/2 of the core used for assay. The remaining core material will be kept in reserve by ALS until sent for future metallurgical testwork.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	Samples varied between wet and dry. The course crystalline nature of the deposit minimizes adverse effects of wet samples. Samples were rotary split during drilling and sample collection. ALS labs dried wet samples using their DRY-21 drying process.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	RC samples were taken from pulverize splits of up to 250 g to better than 85 % passing minus 75 microns. All core samples were dry. Sample preparation: 1kg samples split to 250g for pulverising to -75 microns. Sample analysis: 0.5g charge assayed by ICP-MS technique. Both sampling methods are considered appropriate for the type of material collected and are considered industry standard.
	Quality control procedures adopted for all sub-sampling stages to maximise the representivity of samples.	ARR submitted CRM sample blanks, CRM standard REE samples from CND Labs and duplicate samples for analysis. Each CRM blank, REE standard, and duplicate were rotated into both the RC and core sampling process every 20 samples.
	Measures are taken to ensure that the sampling is representative of the in situ material collected, including, for instance, results for field duplicate/second-half sampling.	RC samples were collected using a continuous feed rotary split sampler. Fillet cuts along the entire length of all core are representative of the in-situ material.

Section 1 Sampling Techniques and Data		
(Criteria in this section apply to all succeeding sections.)		
Criteria	***JORC Code explanation***	***Commentary***
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Allanite is generally well distributed across the core and the sample sizes are representative of the fine grain size of the Allanite.
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.*	ALS uses a 5-acid digestion and 32 elements by lithium borate fusion and ICP-MS (ME-MS81). For quantitative results of all elements, including those encapsulated in resistive minerals. These assays include all rare earth elements. AAL Labs uses 5-acid digestion and 48 element analysis including REE reported in ppm using method REE-5AO48 and whole-rock geochemical XRF analysis using method X-LIB15.
	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.	Samples at 25m intervals were photographed and analysed using an Olympus Vanta handheld XRF analyser in triplicate. Lanthanum, Cerium, Neodymium, and Praseodymium were analysed. Simple average values of three XRF readings were calculated. Seven of the core holes received ATV/OTV logging as well as slim hole induction which recorded natural gamma and conductivity/resistivity. All geophysical logging was completed by Century Geophysical located in Gillette, WY. All tools were properly calibrated prior to logging.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	For the RC drilling, ARR submitted CRM sample blanks, CRM standard REE samples from CND Labs and duplicate samples for analysis. CRM and Blank samples were inserted alternately at 20 sample intervals. The same was done for the core drilling completed Fall 2023. ALS Laboratories will additionally incorporate their own Qa/Qc procedure. For core drilling completed Spring 2022, ARR submitted CRM sample blanks, CRM standard REE samples from CND Labs and duplicate samples for analysis. Blank samples were added one for every 10 core samples, REE samples were added one for every 25 core samples, and Duplicate samples were added one per every 25 core samples. Internal laboratory blanks and standards will additionally be inserted during analysis.

Section 1 Sampling Techniques and Data		
(Criteria in this section apply to all succeeding sections.)		
Criteria	***JORC Code explanation***	***Commentary***
Verification of sampling and assaying	*The verification of significant intersections by either independent or alternative company personnel.*	RC chip samples have not yet been verified by independent personnel. Consulting company personnel have observed the assayed core samples. Company personnel sampled the entire length of each hole.
	The use of twinned holes.	No twinned holes were used.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Data entry was performed by ARR personnel and checked by ARR geologists. All field logs were scanned and uploaded to company file servers. All photographs of the core were also uploaded to the file server daily. Drilling data will be imported into the DHDB drill hole database. All scanned documents are cross-referenced and directly available from the database. Assay data from the RC samples was imported into the database directly from electronic spreadsheets sent to ARR from ALS. Core assay data was received electronically from AAL labs. These raw data as elements reported ppm were imported into the database with no adjustments.
	Discuss any adjustment to assay data.	Assay data is stored in the database in elemental form. Reporting of oxide values are calculated in the database using the molar mass of the element and the oxide.
Location of data points	*Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	RC drill holes have been located using handheld GPS units. Final surveys of hole locations will be performed by professional surveyors. Drill hole location is based on GPS coordinates +/- 10 ft (3 m) accuracy.
	Specification of the grid system used.	The grid system used to compile data was NAD83 Zone 13N.
	Quality and adequacy of topographic control.	Topography control is +/- 10 ft (3 m).

Section 1 Sampling Techniques and Data		
(Criteria in this section apply to all succeeding sections.)		
Criteria	***JORC Code explanation***	***Commentary***
Data spacing and distribution	*Data spacing for reporting of Exploration Results.*	The Fall 2023 program included drill hole spacing at approximately 100 m resolution. For previous programs, holes were both randomly spaced and localised clustering of drillholes.
	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.	Data from the Fall 2023 program will be at a high enough resolution to provide a measured resource at the Overton Mountain project area.
	Whether sample compositing has been applied.	Each sample is the result of assaying a 5 ft interval of core or 1.5 m RC interval.
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.*	Mineralization at Halleck Creek is a function of fractional crystallization of allanite in syenitic rocks of the Red Mountain Pluton. Mineralization is not structurally controlled and exploration drilling to date does not reveal any preferential mineralization related to geologic structures. Therefore, orientation of drilling does not bias sampling.
	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.	Orientation of drilling does not bias sampling.
Sample security	*The measures are taken to ensure sample security.*	All RC chip samples were collected from the drill rigs and stored in a secured, locked facility. Sample pallets were shipped weekly, by bonded carrier, directly to ALS labs in Twin Falls, ID. Chains of custody were maintained at all times. All core was collected from the drill rig daily and stored in a secure, locked facility until the core was dispatched by bonded courier to ALS Laboratories. Chains of custody were maintained at all times.

Section 1 Sampling Techniques and Data		
(Criteria in this section apply to all succeeding sections.)		
Criteria	***JORC Code explanation***	***Commentary***
		All rock samples were in the direct control of company geologists until dispatched to American Assay Labs.
Audits or reviews	*The results of any audits or reviews of sampling techniques and data.*	No external audits or reviews have been conducted to date. However, sampling techniques are consistent with industry standards.

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.*	ARR acquired 5 unpatented federal lode claims on BLM US Federal Land totalling 71.6 acres (29 has) from Zenith Minerals, Ltd (Zenith). in 2021. 67 unpatented federal lode claims were staked by ARR that totalled 1193.3 acres (482 ha) in summer 2021. ARR staked 182 unpatented federal lode claims in March 2022 covering an area of approximately 3,088 acres (1,250 ha). ARR staked 118 unpatented federal lode claims in November 2022 covering an area of approximately 2,113 acres (855 ha). As of December 31, 2022, ARR controlled 367 unpatented federal lode claims and 4 Wyoming State mineral licenses covering 8,165 acres (3,304 ha).
	The security of the tenure held at the time of reporting and any known impediments to obtaining a licence to operate in the area.	No impediments to holding the claims exist. To maintain the claims an annual holding fee of $165/claim is payable to the BLM. To maintain the State leases minimum rental payments of $1/acre for 1-5 years; $2/acre for 6-10 years; and $3/acre if held for 10 years or longer.
Exploration done by other parties	*Acknowledgment and appraisal of exploration by other parties.*	Prior to sampling by WIM on behalf of Blackfire Minerals and Zenith there was no previous sampling by any other groups within the ARR claim and Wyoming State Lease blocks.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Geology	*Deposit type, geological setting and style of mineralisation.*	The REE's occur within Allanite which occurs as a variable constituent of the Red Mountain Pluton. The occurrence can be characterised as a disseminated type rare earth deposit.
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:*	For the Fall 2023 program, FTE DRILLING USA INC. of Mount Uniacke, Nova Scotia used a Schraam T-450 track mounted rig to drill 15 reverse circulation drill holes. Drill hole depths for 37 holes was 102 m. FTE also utilized an enclosed Versa-Drilling diamond core rig to drill eight HQ-sized core holes. For the Fall 2022 program, FTE DRILLING USA INC. of Mount Uniacke, Nova Scotia used a Schraam T-450 track mounted rig to drill 37 reverse circulation drill holes. Drill hole depths for 37 holes was 150m and one hole at 175.5m Authentic Drilling from Kiowa, Colorado used both a track mounted and ATV mounted core rig to drill nine HQ diameter core holes. From March to April 2022, ARR drilled nine core holes across the Halleck Creek claim area. Drill holes ranged in depth from 194 to 352.5 ft with a total drilled length of 3,008 ft (917 m).
	easting and northing of the drill hole collar	Drilling information from the Fall 2022 drilling campaign is presented in detail in the "Technical Report of Exploration and Maiden Resource Estimates of the Halleck Creek Rare Earths Project", March 2023. Drilling information from the Fall 2023 campaign was published in the report "Summary of 2023 Infill Drilling at the Halleck Creek Project Area", November 2023.
	elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar	
	dip and azimuth of the hole	
	downhole length and interception depth	
	Hole length.	
	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	No Drilling data has been excluded.

Section 2 Reporting of Exploration Results		
(Criteria listed in the preceding section also apply to this section.)		
Criteria	***JORC Code explanation***	***Commentary***
	Competent Person should clearly explain why this is the case.	
Data aggregation methods	*In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.*	Average Grade values were cut at minimum of TREO 1,000 ppm.
	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.	Assays are representative of each 1.50 m, (~5 ft) sample interval.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	Metal equivalents were used in economic sensitivities.
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.* *If it is unknown and only the downhole lengths are reported, there should be a clear statement*	Allanite mineralization observed at Halleck Creek occurs uniformly throughout the CQM and BHS rocks of within the Red Mountain Pluton. Therefore, the geometry of mineralisation does not vary with drill hole orientation or angle within homogeneous rock types.

Section 2 Reporting of Exploration Results		
(Criteria listed in the preceding section also apply to this section.)		
Criteria	***JORC Code explanation***	***Commentary***
	to this effect (e.g. 'down hole length, true width not known').	
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.*	Location information is presented in detail in the "Technical Report of Exploration and Maiden Resource Estimates of the Halleck Creek Rare Earths Project", March 2023
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 practised to avoid misleading reporting of Exploration Results.*	The latest exploration results reported in "Mapping and Surface Sampling Summary at the Halleck Creek Project Area: April 2022". All relevant information for this section can be found in Table 1 in the "Technical Report of Exploration and Maiden Resource Estimates of the Halleck Creek Rare Earths Project", March 2023, and in report "Summary of 2023 Infill Drilling at the Halleck Creek Project Area", November 2023.
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*	In hand specimen this rock is a red colored, hard and dense granite with areas of localized fracturing. The rock shows significant iron staining and deep weathering. Microscopic description: In hand specimen the samples represent light colored, fairly coarse-grained granitic rock composed of visible secondary iron oxide, amphibole, opaques, clear quartz and pink to white colored feldspar. All of the specimens show moderate to strong weathering

Section 2 Reporting of Exploration Results		
(Criteria listed in the preceding section also apply to this section.)		
Criteria	***JORC Code explanation***	***Commentary***
	characteristics; potential deleterious or contaminating substances.	and fracturing. Allanite content is variable from trace to 2%. Rare Earths are found within the Allanite. Historical metallurgical testing consisted of concentrating the Allanite by both gravity and magnetic separation. The current program employs sequential high gradient magnetic separation and flotation to produce a concentrate suitable for downstream rare earth elements extraction.
Further work	*The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).*	Further drilling is planned to increase the area of the project, and to increase confidence levels of resources. Geological mapping and surface sampling will also be performed to define and prioritize drilling targets.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Additional drilling is planned in new exploration areas and to increase resource confidence levels.

Section 3 Estimation and Reporting of Mineral Resources		
(Criteria listed in the preceding section also apply to this section.)		
Criteria	***JORC Code explanation***	***Commentary***
Database integrity	*Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.*	Drill hole data header, lithologic data checked by field geologists and by visual examination on maps and drill hole striplogs. Assay and Qa/Qc data were imported into the database directly from electronic spreadsheets provide by laboratories. Histograms graphical logs were also prepared and reviewed by ARR geologists.

Section 3 Estimation and Reporting of Mineral Resources		
(Criteria listed in the preceding section also apply to this section.)		
Criteria	***JORC Code explanation***	***Commentary***
	Data validation procedures used.	
Site visits	*Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* *If no site visits have been undertaken indicate why this is the case.*	Mr. Dwight Kinnes visited the Halleck Creek site numerous times in 2023 and 2024. Mr. Gordon Sobering and Mr. Mark Stacy of Stantec visited the on November 29, 2023. Mr. Alf Gillman of Odessa Resources and Mr. Kelton Smith of Tetra Tech visited the site on March 7, 2024.
Geological interpretation	*Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* *Nature of the data used and of any assumptions made.* *The effect, if any, of alternative interpretations on Mineral Resource estimation.* *The use of geology in guiding and controlling Mineral Resource estimation.* *The factors affecting continuity both of grade and geology.*	The Halleck Creek RE deposit is contained with rocks of the Red Mountain Pluton. These rocks consist primarily of clinopyroxene quartz monzonite (CQM), and biotite hornblende syenite (BHS). These two lithologies are difficult to visually distinguish. However, the concentration of rare earth elements is observable between lithologies. Rocks of the Elmers Rock Greenstone Belt (ERGB) and the Sybille (Syb) intrusion are easily distinguishable from rocks of the RMP. These rock units are essentially barren of rare earth elements. Therefore, the confidence in discerning rocks of the RMP from is high. The extent of the RMP relative to other units was outlined into modelling domains used for resource estimates. The distribution of allanite throughout CQM and BHS rocks of the RMP is generally uniform and is not structurally controlled. Potassic alternation observed does not appear to affect the grade of allanite throughout the deposit.
Dimensions	*The extent and variability of the Mineral Resource expressed as length (along strike or*	The Halleck Creek REE project currently contains two primary resource areas: the Red Mountain area and the Overton Mountain area. Resources also extend into the Bluegrass resource area.

Section 3 Estimation and Reporting of Mineral Resources

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

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td>otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.</td><td>
The Red Mountain resource area is bounded to the west by the ERGB, and to the south by the Syb. Further exploration is needed to determine the extent to the north and two the east.
RC samples with TREO grades exceeding 1,500 ppm occurred at the base of 37 drill holes in the Red Mountain resource area extending down to depths of 150m with one hole extending to a depth of 175.5m. Therefore, ARR considers the Red Mountain resource area to be open at depth.
The Overton Mountain resource area is bounded to the west by mineral claims, and therefore, remains open to the west. Lower grade BHS rocks occur at the northern end of Overton Mountain. Drilling data to the east and south indicate that the Overton Mountain resource area remains open across Bluegrass Creek.
Like the Red Mountain drilling, RC samples at Overton Mountain contained TREO assay values exceeding 3,500 ppm to depths of 150m in 18 holes. One, 302m diamond core hole additionally exhibited grades exceeding 2,000 ppm to the bottom of the hole. Therefore, ARR considers the Overton Mountain resource area to be open at depth.
</td></tr>
<tr><td>Estimation and modelling techniques</td><td>The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.</td><td>
Odessa Resources updated block models for Overton Mountain and Red Mountain using the Leapfrog geological modelling software.
Block Model Parameters
<table>
<tr><th>Block Model Parameter</th><th>Value</th></tr>
<tr><td>Parent Block Size</td><td>20m</td></tr>
<tr><td>Sub-block count (i, j, k)</td><td>4, 4, 4</td></tr>
<tr><td>Minimum block size (i, j, k)</td><td>5m ,5m, 5m</td></tr>
<tr><td>Base point (x, y, z)</td><td>473900.00, 4631300.00, 2000.00</td></tr>
</table>
</td></tr>
</table>

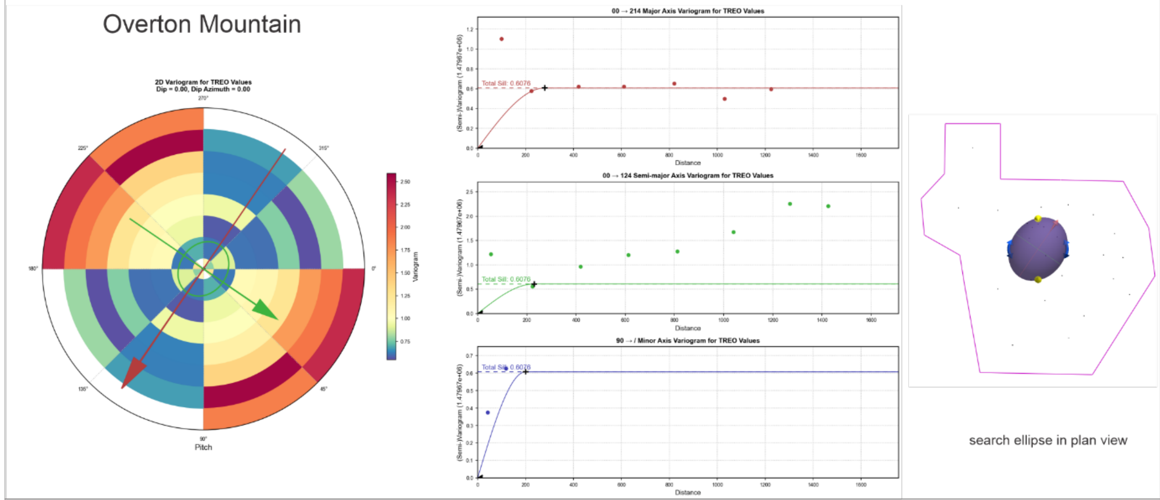
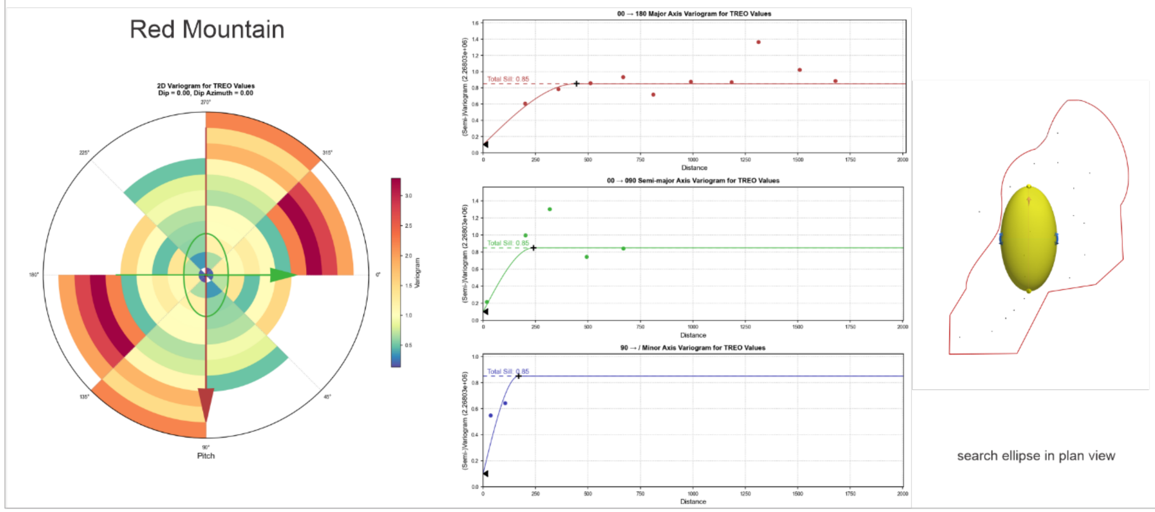
Section 3 Estimation and Reporting of Mineral Resources

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

Criteria	JORC Code explanation	Commentary
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data. *The assumptions made regarding recovery of by-products.* *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).* *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* *Any assumptions behind modelling of selective mining units.* *Any assumptions about correlation between variables.* *Description of how the geological interpretation was used to control the resource estimates.* *Discussion of basis for using or not using grade cutting or capping.*	See tables below. The block model contains attributes pertaining to resource block, resource category, grade class, geologic domain, and numerical attributes for TREO, rare earth oxides of all rare earth elements. Geological domains focused on higher grade CQM and BHS lithologies which provided control of resource block boundaries along with variography.

Boundary size (W x L x H)	2400.00, 5400.00, 600.00
Azimuth	0
Dip	0
Pitch	0
Size in Blocks	120x270x30=972,000

General	Direction			Structure 1					
Variogram Name	Dip	Dip Azimuth	Pitch	Normalized Nugget	Normalized sill	Structure	Major	Semi-major	Minor
OM	0	0	124	0	0.6	Spherical	280	230	200
RM	0	0	90	0.1	0.8	Spherical	445	240	170

	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	 

Section 3 Estimation and Reporting of Mineral Resources		
(Criteria listed in the preceding section also apply to this section.)		
Criteria	***JORC Code explanation***	***Commentary***
Moisture	*Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	Tonnages are based on in-situ, dry basis.
Cut-off parameters	*The basis of the adopted cut-off grade(s) or quality parameters applied.*	A cut-off grade of 1,000 ppm TREO was applied to reported resource estimates based on preliminary net smelter calculations performed by Stantec.
Mining factors or assumptions	*Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	No mine plan or design has been prepared at this stage however the shallow nature of the deposit assumes extraction by open pit mining methods.

Section 3 Estimation and Reporting of Mineral Resources		
(Criteria listed in the preceding section also apply to this section.)		
Criteria	***JORC Code explanation***	***Commentary***
Metallurgical factors or assumptions	*The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	Preliminary metallurgical testwork shows that use of dense media separation and WHIMS can potentially reject up to 93% of waste and upgrade grade by about 11 times. Additional testwork is being planned to test these processes on larger volumes of core. Direct sulphuric acid leaching shows that more than 90% of REE can be extracted from allanite. Additional testwork is being planned to test these processes on larger volumes of core.
Environmental factors or assumptions	*Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported.*	ARR is in the process of outlining environmental, social, and community impacts regarding the potential development of the project. These impacts are being included in conceptual designs of all facets of the project.

Section 3 Estimation and Reporting of Mineral Resources		
(Criteria listed in the preceding section also apply to this section.)		
Criteria	***JORC Code explanation***	***Commentary***
	Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	
Bulk density	*Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.* *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.* *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	An average specific gravity of 2.70 represents the in-place ore material at Halleck Creek based on hydrostatic testing. Bulk density testing will be included during bulk sample collection currently being designed and permitted.
Classification	*The basis for the classification of the Mineral Resources into varying confidence categories.* *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and*	The classification at Halleck Creek is based on the following key attributes: **Geological continuity between drill holes** • Mineralization is controlled by batholith-scale fractionation. Hence, both empirical observations and statistical analysis confirm a very high degree of continuity with the respective rock masses at Overton Mountain and Red Mountain. • This is supported by variography.

Section 3 Estimation and Reporting of Mineral Resources		
(Criteria listed in the preceding section also apply to this section.)		
Criteria	***JORC Code explanation***	***Commentary***
	metal values, quality, quantity and distribution of the data). *Whether the result appropriately reflects the Competent Person's view of the deposit.*	**Drill spacing and drill density** • The drill pattern is mostly irregular with drill spacing of approximately 200m. • At Overton Mountain an area has been infilled on a systematic grid spacing of approximately 90m. This spacing is considered to be adequate to support a measured classification. The CP considers the above classification strategy and methodology to be appropriate and reasonable for this style of mineralisation.
Audits or reviews	*The results of any audits or reviews of Mineral Resource estimates.*	There have not been any audits of mineral resource estimates.
Discussion of relative accuracy/ confidence	*Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be*	Reported resources for Halleck Creek are in-place global estimates of tonnage and rare earth grade. The basis of classification of mineral resources was based on geostatistical analysis of variograms of rare earth elements. The resource is classified as either measured, indicated or inferred. Subject to the application of 'modifying factors' the measured plus indicated component of the resource may allow for a formal evaluation of its economics with the potential to be converted to a Probable Ore Reserve. Therefore, a high degree of conservatism has been adopted as the underlying premise of the resource classification and, in particular, the indicated component.

Section 3 Estimation and Reporting of Mineral Resources		
(Criteria listed in the preceding section also apply to this section.)		
Criteria	***JORC Code explanation***	***Commentary***
	relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used. *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	

Section 4 Estimation and Reporting of Ore Reserves		
(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)		
Criteria	**JORC Code explanation**	**Commentary**
Mineral Resource estimate for conversion to Ore Reserves	*Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.* *Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.*	No mineral resources have been converted to Ore reserves
Site visits	*Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* *If no site visits have been undertaken indicate why this is the case.*	Mr. Gordon Sobering, Senior Project Manager of the Halleck Creek Scoping Study representing Stantec, completed a site visit on Wednesday, 29 November 2023 with executives and geologists from ARR, including Mr. Dwight Kinnes and Mr. Donald Swartz. The visit included an inspection of the land at both Red Mountain and Overton Mountain and the project geology. Mr Kelton Smith

Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
		of Tetra Tech and Mr. Alf Gillman of Odessa Resources, completed a site visit on March 7, 2024 with Messrs. Dwight Kinnes and Don Swartz of ARR.
Study status	*The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.* *The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.*	American Rare Earths Pty. Ltd. (ARR) has engaged Stantec Consulting Services Inc. (Stantec) to conduct a scoping study under the Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code or JORC) standards for the Halleck Creek Rare Earth Deposit (HCRE-D. As such, mineral resources are reported in this study and not ore reserves, as is stated for a scoping study in the JORC code.
Cut-off parameters	*The basis of the cut-off grade(s) or quality parameters applied.*	The break-even cut-off grade was calculated using mining costs ($3.95/ore tonne) determined by Stantec and milling costs ($26.43/ore tonnes) supplied by Tetratech (ARR's metallurgical consultant) and are appropriate for a mine of this size and scale. General and Administration costs are included in both costs listed above.
Mining factors or assumptions	*The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).*	Surface mining was chosen as the method to extract the resource due to mineralization outcropping on surface and the homogeneity of the mineral grade over a large extent. In the absence of geotechnical data Stantec used reasonable bench angles, catch bench widths based on industry experience. Mining and metallurgical costs were from Stantec and Tetratech's respective cost databases for a mine and mill of this size and scale. Process recoveries were based on preliminary test work on samples of the mineralization.

Section 4 Estimation and Reporting of Ore Reserves		
(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)		
Criteria	**JORC Code explanation**	**Commentary**
	The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc. *The assumptions made regarding geotechnical parameters (eg pit slopes, stope sizes, etc), grade control and pre-production drilling.* *The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).* *The mining dilution factors used.* *The mining recovery factors used.* *Any minimum mining widths used.* *The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.* *The infrastructure requirements of the selected mining methods.*	Mine design work was based on Geovia's Whittle mine software package, using a block model supplied by ARR and reviewed by Stantec for adequacy at a scoping level of study. The following mine design parameters were used in the pit design: Height between catch benches 6 m Bench Face Angle 70° Berm Width 2.9 m Total Road Allowance 18.5 m Maximum Ramp Grade 10% Minimum Operating Width 30 m

Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary

Parameter	Unit	Red Mountain & Overton Mountain							
Revenue, Smelting & Refining		**La**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**
Price	USD	$2.00	$91.00	$91.00	$10.00	$10.00	$10.00	$1,500.00	$400.00
Recovery	%	68.63%	63.86%	63.86%	70.11%	70.11%	70.11%	70.22%	66.49%
Refining Price Factor	%	0%							
Treatment Charges	USD	$0.00							
Refining Costs	USD	$0.00							
Shipping Costs	USD	$0.00							
Transportation Concentrate Losses	%	0%							
Recovery and Dilution									
External Mining Dilution	%	0%							
Mining Recovery	%	100%							
Geotechnical									
Slope ISA	deg	50							
OPEX									
Milling Cost	USD	$26.43							
Surface Mining Cost	USD	$3.95							
Site G&A	USD	$0.00							
Total OPEX Cost	USD	$29.28							

No mining dilution was used in the mine design of this study and a mining recovery of 100 % was assumed. Based on the chosen mining equipment, a minimum mining width of 30 meters was utilized. Measured, indicated and inferred mineral resources were included in the mine design, which is appropriate at a scoping level of study. Due to the homogeneity of the mineralization, while it is not reasonable to state that all inferred resources will be converted to a more precise mineral resource category, in general it is felt that the it is reasonable to assume that the majority

Section 4 Estimation and Reporting of Ore Reserves		
(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)		
Criteria	**JORC Code explanation**	**Commentary**
		of the inferred resource will be converted to indicated or measured with additional sampling due to the size and homogeneity of the mineralized zone. Supporting mine infrastructure is discussed in the appropriate section of this paper.
Metallurgical factors or assumptions	*The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.* *Whether the metallurgical process is well-tested technology or novel in nature.* *The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.* *Any assumptions or allowances made for deleterious elements.* *The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.*	Based on testwork to date, metallurgical recovery factors for the study as thus: La Recovered (kg) 68.6% NdPr Recovered (kg) 63.9% SEG Recovered (kg) 70.1% Tb Recovered (kg) 70.2% Dy Recovered (kg) 66.5%

Section 4 Estimation and Reporting of Ore Reserves		
(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)		
Criteria	**JORC Code explanation**	**Commentary**
	For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?	
Environmental	*The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.*	ARR acquired exploration drilling notices from the Wyoming Department of Environmental Quality (WDEQ), Land Quality Division, for all drilling activities performed to date. ARR is developing a permitting needs assessment with local environmental consulting groups to present to each division at WDEQ to identify comprehensive environmental baseline studies needed to permit a mining operation at Halleck Creek. ARR is identifying additional regulatory stakeholders in Wyoming as part of the needs assessment. Factors for mine closure have been included in mining costs and financial modeling. At this stage of development, no mine closure plans have been developed. At this stage in project development, no social impact studies have been completed.
Infrastructure	*The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.*	Processing facilities will be split between the mine site and a second site near Wheatland, Wyoming. A concentrate will be produced at the mine site and trucked by highway to the second and final processing facility where saleable metals will be produced. Infrastructure consisting of roads, water supply, electrical power, natural gas and buildings to support operations at both sites is included in the economics of the project. Mining, oil and gas operations are common in Wyoming and is reasonable to expect a well trained work force will be able to be attracted to the operation during start up and life of mine operations.
Costs	*The derivation of, or assumptions made, regarding projected capital costs in the study.*	Site capital costs buildings were determined from the Mine Cost Handbook (2021) and escalated based on inflation factors to 2023 costs. Costs to erect access roads and construct the water

Section 4 Estimation and Reporting of Ore Reserves		
(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)		
Criteria	**JORC Code explanation**	**Commentary**
	The methodology used to estimate operating costs. *Allowances made for the content of deleterious elements.* *The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.* *The source of exchange rates used in the study.* *Derivation of transportation charges.* *The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.* *The allowances made for royalties payable, both Government and private.*	supply system were based on construction and drilling costs from recent similar projects Stantec has worked on. Stantec relied on price expectations provided by ARR, which were based on price forecasts from multiple firms. No exchange rates were used in this study, as all costs are in US dollars.
Revenue factors	*The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.*	

<table>
<tr><td colspan="3">Section 4 Estimation and Reporting of Ore Reserves</td></tr>
<tr><td colspan="3">(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)</td></tr>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td>he derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.</td><td></td></tr>
<tr><td>Market assessment</td><td>The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.

A customer and competitor analysis along with the identification of likely market windows for the product.

Price and volume forecasts and the basis for these forecasts.

For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.</td><td>Rare earth price assumptions used in the base case scenario are derived from ARR's assessment of price expectations over the next couple of years. ARR's assessment is based on an average of spot and price forecasts from Goldman Sachs, Morgan Stanley, JPM Chase, and Canaccord Genuity. The resultant price is lower than the average price over the past two years. All prices are FOBfob. Pricing data from the various sources can be found in Appendix BX and are summarized in the table below.

<table>
<tr><th>Product</th><th>Price ($/kg)</th></tr>
<tr><td>NdPrO</td><td>$90.61</td></tr>
<tr><td>Dysprosium</td><td>$400</td></tr>
<tr><td>Terbium</td><td>$1,500</td></tr>
<tr><td>SEG</td><td>$10</td></tr>
<tr><td>Lanthanum</td><td>$2</td></tr>
</table></td></tr>
<tr><td>Economic</td><td>The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.

NPV ranges and sensitivity to variations in the significant assumptions and inputs.</td><td>The evaluation of the project assumes 100% ownership.

The financial model was completed on yearly increments; NPV was determined at both pre and post-tax treatments, using the Discounted Cash Flow method of valuation using discount rates of 8%, 10% and 12%. Some costs were escalated at a rate of 5% per annum from the date of their source to 2023 costs. US Federal, Wyoming state tax and various State royalty treatments were applied to the post tax case.</td></tr>
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Section 4 Estimation and Reporting of Ore Reserves		
(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)		
Criteria	**JORC Code explanation**	**Commentary**
		Sensitivity to the major cost drivers have been modelled, including equivalent NdPr price, Processing OPEX, Mining OPEX and Processing CAPEX
Social	*The status of agreements with key stakeholders and matters leading to social licence to operate.*	At this stage in project development, no social impact studies have been completed.
Other	*To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:* *Any identified material naturally occurring risks.* *The status of material legal agreements and marketing arrangements.* *The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third*	No Ore Reserves are reported in this scoping study, in agreement with JORC standards.

Section 4 Estimation and Reporting of Ore Reserves		
(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)		
Criteria	**JORC Code explanation**	**Commentary**
	party on which extraction of the reserve is contingent.	
Classification	*The basis for the classification of the Ore Reserves into varying confidence categories.* *Whether the result appropriately reflects the Competent Person's view of the deposit.* *The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).*	No Ore Reserves are reported in this scoping study, in agreement with JORC standards.
Audits or reviews	*The results of any audits or reviews of Ore Reserve estimates.*	Stantec performed a gap analysis of the resource model before starting any work and found the work adequate to support a scoping study.
Discussion of relative accuracy/ confidence	*Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could*	No Ore Reserves are reported in this scoping study, in agreement with JORC standards.

Section 4 Estimation and Reporting of Ore Reserves		
(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)		
Criteria	**JORC Code explanation**	**Commentary**
	affect the relative accuracy and confidence of the estimate. *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* *Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.* *It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	