30 May 2024

American Rare Earths Announces Zircon Co-Product Potential

Zircon has been significantly upgraded at Halleck Creek as part of low-cost REE pre-concentration

Highlights

- Zircon supply is currently limited but is essential in high-growth industries like ceramics, electronics and nuclear energy, which are experiencing increasing demand globally.
- Initial and historical exploration assay results indicate the potential for significant Zircon co-product potential alongside Rare Earths (REEs) processing at ARR's flagship Halleck Creek project.
  - Zircon can be easily separated and upgraded, owing to its density, as part of the REEs pre-concentration steps in the Halleck Creek flowsheet; potentially providing significant economic value when produced alongside REE's" as a co-product.
  - Historical assay results for zirconium indicate an average in-situ grade is 2,077 ppm. The average crustal abundance is 300 ppm for comparison purposes.
  - Initial assay results from the gravity separation program (spiral testing) within the REEs program provided a 13.7x upgrade which equates to ~2.3%.
  - Through research collaboration with the University of Wyoming, ARR believes zircon is more prevalent at Halleck Creek than previously believed.
  - Beneficiation work currently being performed includes testing to separate and further concentrate zircon using gravity separation and magnetic removal of paramagnetic minerals to further upgrade the material.
  - Laser ablation assay of zircon crystals show elevated levels of heavy REEs, providing additional upside.
- Future exploration and metallurgy work is focused on several opportunities:
  - Separated zirconium concentrate as a co-product, and
  - Heavy REEs extraction from metamict zircon

American Rare Earths **(ASX: ARR | OTCQX: ARRNF | ADR: AMRRY) ("ARR"** or the **"Company")** is pleased to announce the zircon co-product potential alongside REE processing at Halleck Creek as part of a research collaboration with the School of Energy Resources ("SER") at the University of Wyoming.

Donald Swartz, Chief Executive Officer of American Rare Earths, commented:

"*Zircon is typically a minor product obtained from processing heavy mineral sands and has many high value applications across multiple industries. We are thrilled to announce the discovery of a potential co-product in our Halleck Creek project. This potential was only recently identified as part of our previously announced REE processing program modifications emphasising Dense Medium Cyclones work*[1] *led by Lawrence Livermore National Laboratory. This opportunity has the potential to generate significant additional revenue and enhanced project economics. Further details will be provided as we continue our assessment and evolve our strategy to maximise value for our shareholders.*"

[1] ASX Announcement 22 January 2024. American Rare Earths Announces Breakthrough Metallurgical Results

This work is a significant step forward in understanding the potential of zircon within the Red Mountain pluton at ARR's flagship Halleck Creek REEs project. Dr. Lily Jackson, an expert in sedimentology, tectonics, and geochronology from SER, has led this research. The Company aims to understand the significance of zircon within the REEs bearing Red Mountain pluton at Halleck Creek. Zircon, like allanite contains REEs elements and, has the potential to be a significant contributor of Heavy REEs ("HREE") at Halleck Creek.

This market announcement has been authorised for release to the market by the CEO of American Rare Earths.

Technical Summary

Preliminary assessments uncovered notable anomalies in zircon within core samples collected from the Red Mountain pluton. The preliminary findings indicate that zircon may occur in greater abundance than previously observed (Figure 1). Observations also reveal that zircon in the samples have metamict cores like metamict cores observed in allanite at Halleck Creek. Furthermore, this preliminary work indicates that metamict zircon cores (centres) exhibit an exceptional enrichment in REEs Elements compared to their rims. This is well illustrated by cathodoluminescence images as observed in Figure 2.

Dr. Jackson of the University of Wyoming performed laser ablation inductively coupled plasma mass spectrometry analyses on several metamict zircon phenocrysts (crystals) which provided preliminary REE values. The pinpoint laser ablation showed that the metamict centres of the zircon contained anomalously high levels of REEs relative to the rims of the zircon. Lastly, the highly metamict zircon cores suggest that REEs contained within them may be more readily leached than unaltered zircon, potentially offering an avenue for efficient REE recovery. These observations highlight the need for further exploration into the unique properties of zircon at Halleck Creek.

ARR and the University of Wyoming are collaborating to continue investigation of zircon at Halleck Creek. The initial collaboration will consist of performing QEMSCAN analysis at the University of Wyoming, to provide quantitative mineral analysis, and benchtop-scale REE leaching to assess how metamictization of zircon affects extraction of REEs from zircon.

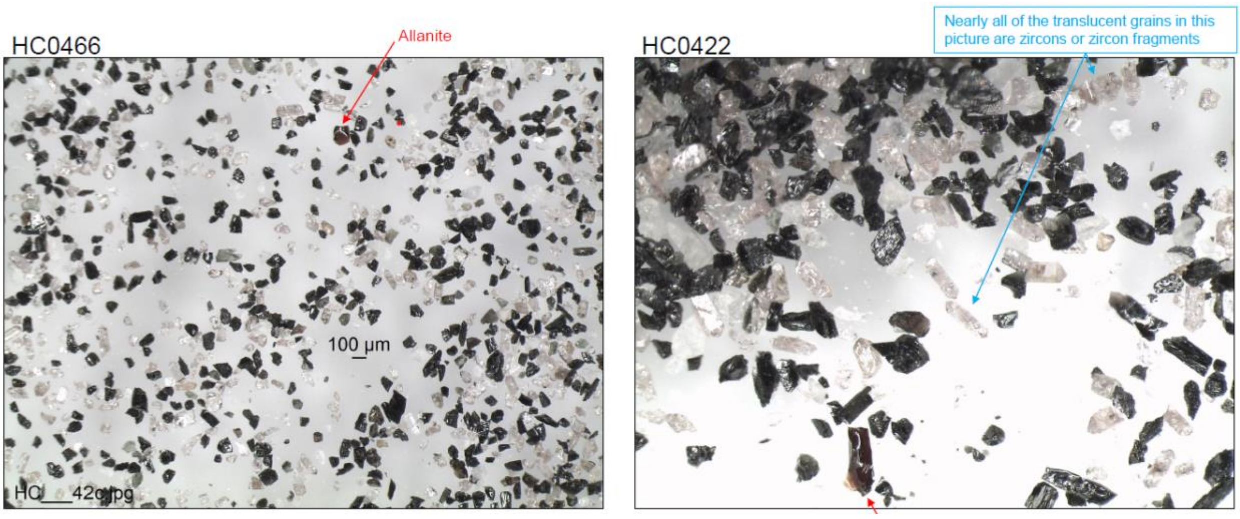

Figure 1 - Images of heavy mineral separates illustrating previously unrecognized abundance of zircon in the Red Mountain pluton ore.

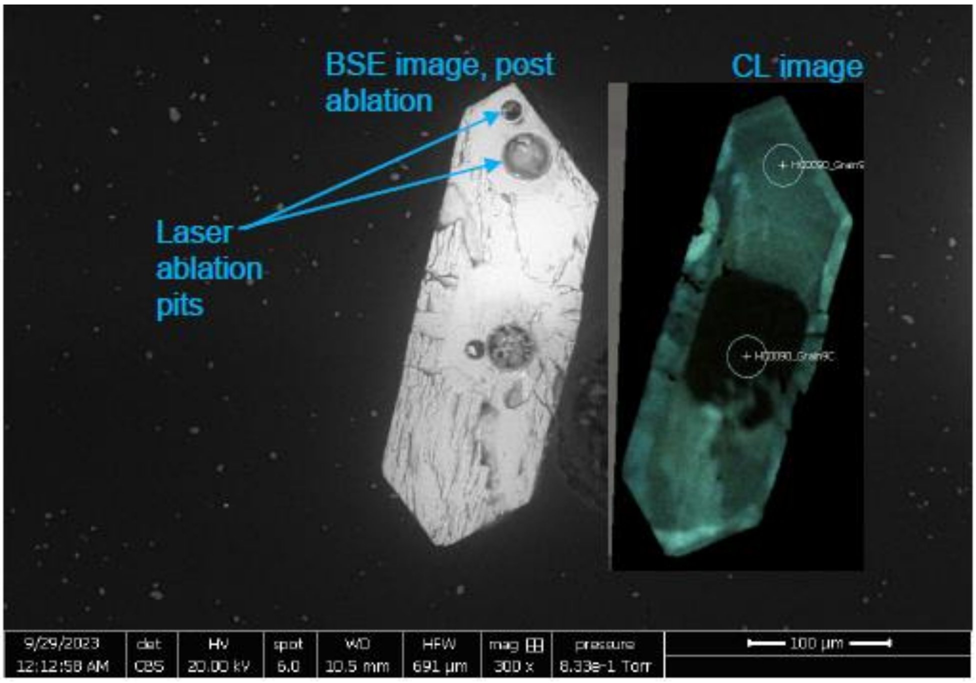

Figure 2 – Back scatter electron and cathodoluminescence image of a single zircon grain from Red Mountain pluton exhibiting metamict and REE enriched cores.

In light is this information from SER, ARR recently reviewed ZrO2 values in drilling assay data across Halleck Creek. In 5,012 drilling assay samples with TREO greater than 1,000ppm, ZrO2 values ranged from 38ppm to 7,402ppm with an average of approximately 2,077ppm. In comparison to average crustal abundance of 300ppm, as determined by the USGS, the average ZrO2 values in Halleck Creek data are approximately 7 times average crustal abundance. Drill hole locations and average ZrO2 assay values by drill hole are shown in Appendix B.

As a proof-of-concept study, Sepro Systems, in Vancouver, British Columbia, performed preliminary rougher spiral separation using 71 kg of Halleck Creek core material. Sepro ground the core samples to p80 of 250 µm. The ground sample was mixed in the pump box at a pulp density of 28% and pumped to the top of a 7-turn mineral spiral. The preliminary rougher spiral concentrate showed significant upgrade factors of TREO and Zircon of 4.9 and 13.7, respectively. The spirals tests showed TREO and Zircon recoveries of 23.5% and 66.2%, respectively for the concentrate material. Upgrades of TREO and Zircon improved when the concentrate and middlings product were combined, indicating that cleaner, scavenger spiral testing would improve overall upgrade factors and recoveries.

It should be noted, this proof-of-concept testing is not indicative of final flowsheets or process design. The results of this testing, while favourable, cannot be used to imply upgrading and recoveries moving forward.

Sepro Spiral Results										
Products	Weight	(%)	TREO (ppm)	SiO_2 (ppm)	Al_2O_3 (ppm)	Fe_2O_3 (ppm)	ZrO_2 (ppm)	LREO (ppm)	MREO (ppm)	HREO (ppm)
Concentrate	308.5	4.8	18,379.4	48.1	11.5	23.0	22,700.0	16,136.8	952.4	1,290.1
Upgrade Factor			***4.9***	*0.8*	*0.7*	*3.8*	***13.7***	*5.0*	*4.4*	*4.0*
Middling	770.5	12.1	6,912.6	60.1	15.2	10.2	1,335.9	5,955.9	389.1	567.6
Upgrade Factor			*1.8*	*1.0*	*0.9*	*1.7*	*0.8*	*1.8*	*1.8*	*1.8*
Concentrate + Middlings	1,079.0	**16.9**	10,191.1	56.6	14.1	13.8	7,444.2	8,866.8	550.2	774.2
Upgrade Factor			***2.7***	*0.9*	*0.8*	*2.3*	***4.5***	*2.7*	*2.5*	*2.4*
Tails	5,311.7	83.1	2,464.2	64.5	17.1	4.5	478.2	2,083.3	149.3	231.6
Calculated Head	6,390.7	100.0	3,768.8	63.2	16.6	6.0	1,654.3	3,228.6	217.0	323.2
Assayed Head			4,127.7	62.4	16.4	6.5	1,659.5	3,545.0	234.0	348.7

			Recovery Distribution (%)							
Products	Weight (g)	(%)	TREO	SiO_2	Al_2O_3	Fe_2O_3	ZrO_2	LREO	MREO	HREO
Concentrate	308.5	4.8	**23.5**	3.7	3.4	18.4	**66.2**	24.1	21.2	19.3
Middling	770.5	12.1	22.1	11.5	11.0	20.3	9.7	22.2	21.6	21.2
Concentrate + Middlings	1,079.0	16.9	**45.7**	15.1	14.4	38.7	**76.0**	46.4	42.8	40.4
Tails	5,311.7	83.1	54.3	84.9	85.6	61.3	24.0	53.6	57.2	59.6
Total	6,390.7	100.0	54.3	84.9	85.6	61.3	24.0	53.6	57.2	59.6

Further information

Jane Morgan
Investor and Media Relations
jm@janemorganmanagement.com.au

Competent Persons Statement:

The information in this document is based on company work performed in September and October 2023. This work was reviewed and approved for release by Mr Dwight Kinnes (Society of Mining Engineers #4063295RM) who is employed by American Rare Earths and has sufficient experience which is relevant to the style of mineralization 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 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 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 consents to the inclusion in the report of the matters based upon the information in the form and context in which it appears.

About American Rare Earths

American Rare Earths Limited **(ASX: ARR | OTCQX: ARRNF | ADR: AMRRY)** owns the Halleck Creek, WY and La Paz, AZ rare earth deposits which have the potential to become the largest and most sustainable rare earth projects in North America. American REEs 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 REEs elements to help ensure a renewable future.

Appendix A – JORC Table 1

JORC Code, 2012 Edition – Table 1 Halleck Creek Exploration Area		
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.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Core recoveries and RQDs were calculated by ARR field geologists for all core holes. Detailed geotechnical logging commenced for fall 2023 drilling.
	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	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

	problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	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 test work.
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
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.

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.
	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.
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).
Data spacing and distribution	*Data spacing for reporting of Exploration Results.*	The Fall 2023 program included drill hole spacing at 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. 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, 2023, 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.
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
	easting and northing of the drill hole collar *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* *dip and azimuth of the hole* *downhole length and interception depth* *Hole length.*	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 will be published in an updated, upcoming report.
	If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	Drill holes without ZrO2 assays have been excluded from summary.
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 TREO Grade values were cut at minimum of TREO 1,000 ppm. Sample lengths and material density are uniform, therefore, simple average ZrO2 values were compiled from assay data.
	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 1.5 (5 ft) sample interval.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalents used.
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 to this effect (e.g. 'down hole length, true width not known').*	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.
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.*	All relevant information for this section can be found in Table 1 in the " Technical Report of Exploration and Updated Resource Estimates of the Halleck Creek Rare Earths Project", February 2024.
Other substantive exploration data	*Other exploration data, if meaningful and material, should be reported, including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	ZrO_2 assay values were reviewed as potential for additional revenue streams for Halleck Creek. The locations and average ZrO_2 assay results, by drill hole are presented in Appendix B of this document.
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.	

Appendix B – Drill Hole Locations and Average ZrO2 assay values

Drill Hole	Northing	Easting	Collar	Total Depth	Samples	Average ZrO2	Minimum ZrO2	Maximum ZrO2
HC22-OM006	4,636,138.88	474,453.60	1,779.06	150.00	87	2,651	1179	3971
HC22-OM007	4,635,643.98	474,336.73	1,784.70	150.00	99	2,941	663	4768
HC22-OM008	4,635,621.81	474,660.90	1,771.45	150.00	98	2,367	1824	2810
HC22-OM009	4,635,648.19	475,016.29	1,755.33	150.00	100	1,859	1002	2546
HC22-OM010	4,635,665.94	475,246.77	1,747.01	150.00	97	2,269	1164	3053
HC22-OM011	4,635,588.17	475,454.07	1,739.45	150.00	98	2,052	1358	2823
HC22-OM012	4,635,426.34	475,633.21	1,736.10	150.00	100	1,876	900	2681
HC22-OM013	4,635,253.05	475,541.78	1,739.10	150.00	93	1,856	936	2553
HC22-OM014	4,635,227.73	475,703.27	1,731.54	150.00	100	1,925	997	3418
HC22-OM015	4,635,055.81	475,622.07	1,733.51	150.00	95	1,581	851	2492
HC22-OM016	4,634,921.07	475,757.80	1,720.44	150.00	96	1,487	771	2702
HC22-OM017	4,634,744.56	475,376.83	1,741.31	150.00	100	2,077	837	3634
HC22-OM018	4,635,079.09	475,195.80	1,747.79	150.00	100	1,962	914	3336
HC22-OM019	4,635,230.21	475,071.06	1,753.37	150.00	99	1,876	1167	2958
HC22-OM020	4,635,399.43	475,151.47	1,756.35	150.00	100	1,830	1486	2431
HC22-OM021	4,634,872.16	475,053.22	1,753.22	150.00	99	1,823	1171	2512
HC22-OM022	4,635,051.94	474,934.54	1,764.59	150.00	100	2,076	1255	2729
HC22-OM023	4,634,557.98	475,248.35	1,751.31	150.00	99	1,784	920	3026
HC22-OM024	4,634,964.46	474,664.62	1,801.42	150.00	100	1,811	1220	3728
HC22-OM025	4,634,502.02	474,784.43	1,770.24	150.00	100	1,746	954	3120
HC22-RM005	4,633,192.18	475,745.11	1,747.58	150.00	42	2,090	621	5011
HC22-RM006	4,633,192.18	475,747.15	1,747.53	150.00	38	2,260	925	4390
HC22-RM007	4,633,061.77	475,610.72	1,756.20	150.00	100	1,647	1021	3391
HC22-RM008	4,632,492.67	475,444.13	1,757.06	150.00	64	3,469	2276	5430
HC22-RM009	4,632,318.66	475,583.59	1,757.03	150.00	100	1,905	942	5066
HC22-RM010	4,632,667.80	475,450.61	1,756.94	150.00	100	1,806	1078	2634
HC22-RM011	4,632,703.64	475,246.73	1,764.87	150.00	100	2,001	1248	2479
HC22-RM012	4,632,498.56	475,192.03	1,765.65	150.00	74	2,290	1425	3458
HC22-RM013	4,632,321.23	475,198.52	1,765.92	150.00	96	2,308	1048	3472
HC22-RM014	4,632,132.65	475,199.29	1,768.82	150.00	99	1,841	1351	2472
HC22-RM015	4,631,970.23	475,041.50	1,777.64	175.50	117	1,593	542	3039
HC22-RM016	4,632,833.19	475,606.60	1,753.59	150.00	100	1,559	844	1851
HC22-RM017	4,633,277.28	475,476.60	1,756.70	150.00	96	2,486	1198	7348
HC22-RM018	4,633,267.23	475,278.91	1,767.61	150.00	92	3,217	1553	6686
HC22-RM019	4,633,076.57	475,073.77	1,790.52	150.00	77	3,480	1607	6592
HC22-RM020	4,632,861.92	474,816.59	1,801.97	150.00	13	2,133	525	4079
HC22-RM021	4,633,527.14	475,475.99	1,754.91	150.00	98	2,688	1790	7402
HC22-RM022	4,631,812.72	474,658.01	1,809.35	150.00	30	3,002	1328	4809
HC23-OM026	4,635,160.13	475,303.92	1,748.17	80.00	55	2,332	1358	4795
HC23-OM027	4,635,173.59	475,493.66	1,735.72	80.00	57	2,113	1109	5038
HC23-OM028	4,635,315.94	475,476.43	1,736.14	302.00	219	2,442	358	4336
HC23-OM029	4,635,081.26	475,355.55	1,740.00	102.00	66	1,752	1073	3080
HC23-OM030	4,635,045.38	475,802.81	1,724.52	80.00	62	2,385	1351	3309
HC23-OM031	4,635,088.63	475,445.43	1,735.64	102.00	67	1,495	947	2134
HC23-OM032	4,635,126.55	475,690.08	1,727.61	76.50	53	1,867	627	3499
HC23-OM033	4,635,168.15	475,393.26	1,742.50	102.00	68	1,916	1252	3350
HC23-OM034	4,635,368.70	475,624.71	1,731.95	80.00	56	1,922	1466	3093
HC23-OM035	4,635,116.15	475,562.59	1,732.63	102.00	68	1,565	847	2465
HC23-OM036	4,635,249.93	475,442.81	1,739.01	102.00	68	1,729	1272	2121
HC23-OM037	4,635,490.21	475,570.90	1,739.68	80.00	58	1,908	38	3445
HC23-OM038	4,635,325.68	475,369.93	1,739.65	102.00	68	1,966	678	3823
HC23-OM039	4,635,449.80	475,365.10	1,740.18	80.00	55	2,191	624	4255
HC23-OM040	4,635,196.31	475,617.24	1,731.63	102.00	64	1,984	1405	5930
HC23-OM041	4,635,285.11	475,630.42	1,734.32	102.00	65	1,825	1405	2161
HC23-OM042	4,635,356.82	475,703.43	1,731.09	102.00	68	1,991	1124	2681
HC23-OM043	4,635,374.94	475,531.06	1,733.98	102.00	68	2,083	871	4079

Drill Hole	Northing	Easting	Collar	Total Depth	Samples	Average ZrO2	Minimum ZrO2	Maximum ZrO2
HC23-OM044	4,635,400.30	475,447.99	1,736.46	102.00	68	2,536	1112	5066
HC23-OM045	4,635,456.93	475,523.63	1,737.08	102.00	67	1,986	1385	2614
HC23-OM046	4,635,491.54	475,441.63	1,741.53	102.00	64	1,969	1385	2769
HC23-OM047	4,635,568.71	475,364.51	1,745.38	102.00	64	1,957	1425	2472
HC23-OM048	4,635,504.06	475,284.26	1,745.37	102.00	68	1,853	1432	2182
Grand Total					**5,012**	**2,077**	**38**	**7,402**

Hole Coordinates: UTM Zone 13N, NAD83