For personal use only

Resource Estimate Increased by 64%

Estimated In-Situ Resources Increased to 2.34 Billion Tonnes At 3,196 ppm TREO

Highlights:

- **In-Situ Resources at Halleck Creek increased 64% to 2.34 billion tonnes (1.81 Mt, 27% Magnetic Rare Earth Oxides ("MREO")) at 3,196 ppm Total Rare Earth Oxides ("TREO") using a 1,000ppm TREO cut-off.**
- **1.42 billion tonnes of measured and indicated resources (a 128% increase) were estimated at a grade of 3,295 ppm TREO using a 1,000ppm TREO cut-off.**
- **The progress made around mine planning and metallurgy supports a cut-off grade of 1,000 ppm based on a thorough economic and technical evaluation by independent mining consultant(s), compared to a cut-off grade of 1,500 ppm in prior reporting (See Figure 1 for comparison where grade increased irrespective of cutoff grade).**
- **2023 drilling expanded lateral and vertical resource extents, deposit remains open at depth and along strike.**

American Rare Earths (ASX: ARR | ADRs - OTCQX: AMRRY | Common Shares - OTCQB: ARRNF) **(ARR or the (Company)** is pleased to announce the completion of the detailed "Technical Report of Exploration and Updated Resource Estimates of the Halleck Creek Rare Earths Project" compiled by ARR, which includes updated Resource estimates under the 2012 JORC code. Results of the Sept/Oct 2023 exploration program and additional surface sampling and geological mapping at Halleck Creek provided data to increase in-situ resource estimates to 2.34 billion tonnes at a grade of 3,196 ppm TREO. This is an increase of 64% in in-situ tonnes compared to the Sept/Oct 2023 maiden resource estimate for Halleck Creek. The full technical report is available on the Halleck Creek tab on our website.

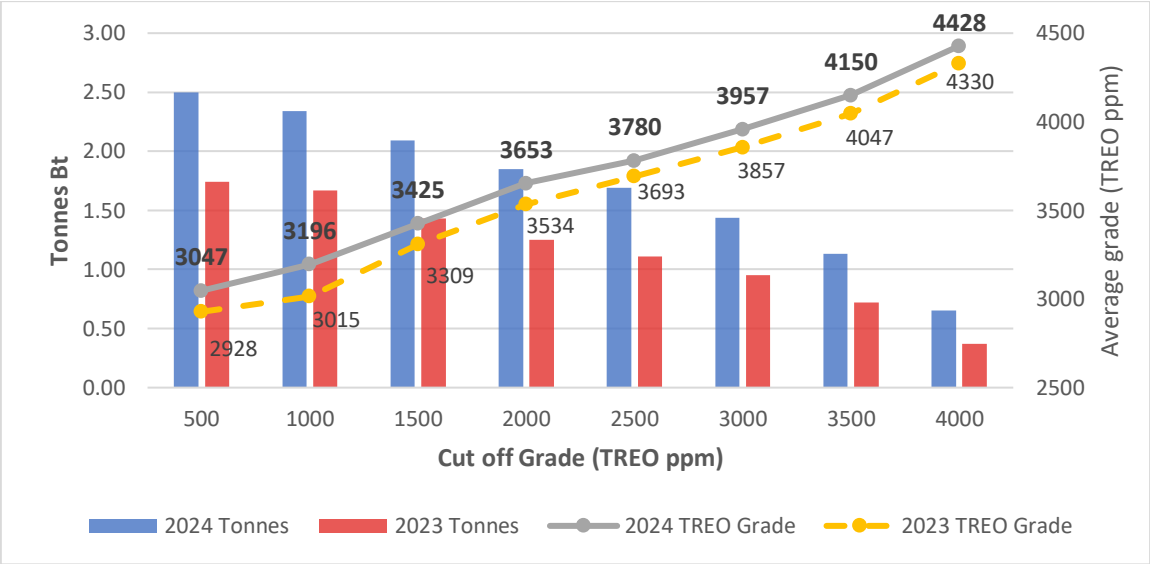


Figure 1 - Grade Tonnage Curve for TREO 2023 v 2024 Update

Table 1 – Estimated Rare Earth Resources at Halleck Creek (1000ppm 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	3,196	2,828	347	774	7,481,070	6,621,059	811,861	1,811,395
Rounded	2,342,000,000	3,196	2,828	347	774	7,481,000	6,621,000	812,000	1,811,000

Adding ARR's outstanding drilling results from Sept/Oct 2023 to the geological model for Halleck Creek expanded laterally and vertically. The Sept/Oct 2023 drilling also provided data to geostatistically define measured resource extents at Overton Mountain and redefine indicated resource extents at Red Mountain with high degrees of geological confidence. Measured and Indicated resource estimates increased by 795 million tonnes (128%), inferred resource estimates increased by 117 million tonnes (15%).

ARR is working with Stantec, an international engineering consulting provider, to develop a JORC scoping study at Halleck Creek. Technical, mining and economic designs are being evaluated for the Halleck Creek project as part of the scoping study. Stantec has determined that an economic cut-off grade of 1,000 ppm TREO defines in-situ resource estimates within proposed mining and economic limits. In the opinion of the Competent Person the 1,000 ppm TREO cut-off grade meets the conditions for reporting of a Mineral Resource with reasonable prospects of eventual economic extraction. A 1,500 ppm cut-off grade was used in the 2023 resource determination, prior to advancing metallurgy.

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

"These results are illustrative of the enormous potential of the project when the resource increases 64% during a developmental drilling campaign, which increased measured/indicated resources 128%. Typically, you'll see the resource decrease as infill drilling takes place – instead we're seeing the opposite, with only 25% of the project being drilled to this point. The low-cost mine plan when combined with the breakthroughs around metallurgy have increased our confidence and excitement about this world class deposit. At 27% MREO, we look forward to releasing the results of the scoping study that is nearing completion."

For personal use only

Magnet rare earth elements (Nd_2O_3, Pr_6O_{11}, Sm_2O_3, Dy_2O_3, and Tb_4O_7) comprise about 27% of the total resource with an average grade of 774ppm MREO with a contained metal estimate of 1.8 million tons.

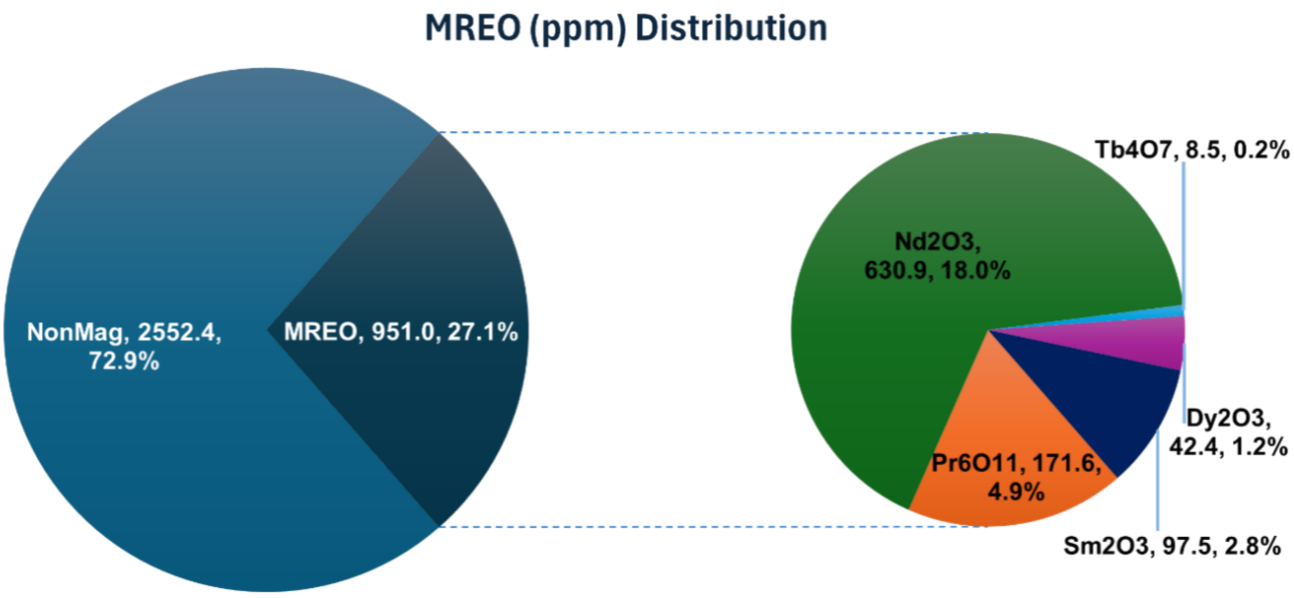
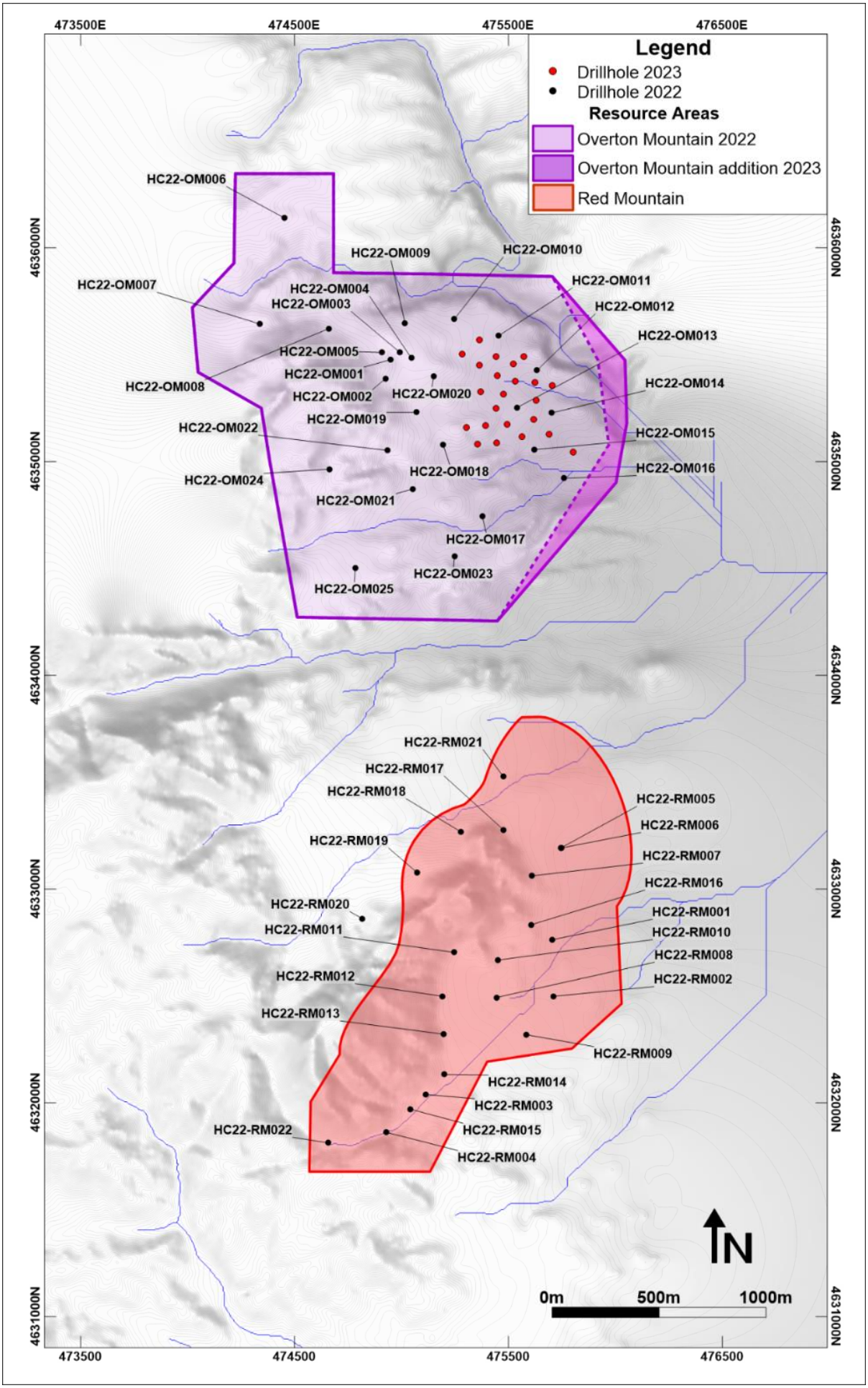


Figure 2 - MREO distribution in drilling data

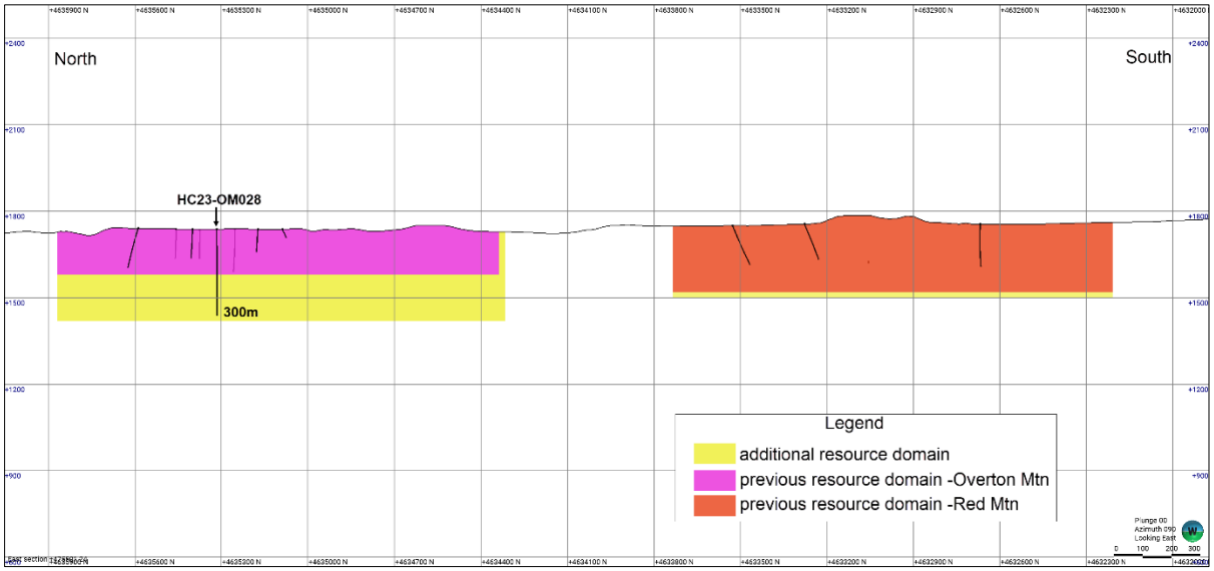
For personal use only

For personal use only



Note: Figure from Odessa, 2024

Figure 3 - Halleck Creek Drill Holes and Model Extent



Note: Figure from Odessa, 2024

Figure 4 -Halleck Creek Vertical Model Extent

Summary of Key Material Information used to Estimate the Mineral Resources

Tenement and Land Status

Wyoming Rare (USA) Inc. a wholly owned subsidiary of American Rare Earths, Inc. controls 367 unpatented lode mining claims totalling 6,320 acres (2,558 ha) across the Halleck Creek Project area. ARR controls an additional 4 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).

Project Geology

Halleck Creek resides in Red Mountain Pluton (RMP) of the 1.43 Ga Laramie anorthosite complex (LAC) is exposed 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.

Drilling

Since April 2022 through October 2023 ARR has drilled 53 RC and 17 Core holes for a total 70 holes and 9,031 metres. All holes have been included in geological resource models.

For personal use only

Table 2 - Halleck Creek Drilling Statistics

Area	Hole Type	No. Holes	Metres
Overton Mountain	HQ core	13	1394.5
	RC	35	4,530
Total		48	5,925
Red Mountain	HQ core	4	381
	RC	18	2,726
Total		22	3,106
Total		**70**	**9,031**

Sampling

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

Sample Analysis

Core samples from the maiden core drilling in 2022 were assayed by American Assay Labs in Reno, NV. RC and Core samples from subsequent drilling were assayed by ALS Global. Both laboratories are fully certified and approximately 6066 samples were used in resource models.

Estimation Methodology

Odessa Resources Ltd., from Perth Australia, updated the Halleck Creek resource model using Leapfrog Edge, with all drill hole data variograms and block model parameters were updated. Grade estimation was carried using an ordinary kriged (“OK”) interpolant.

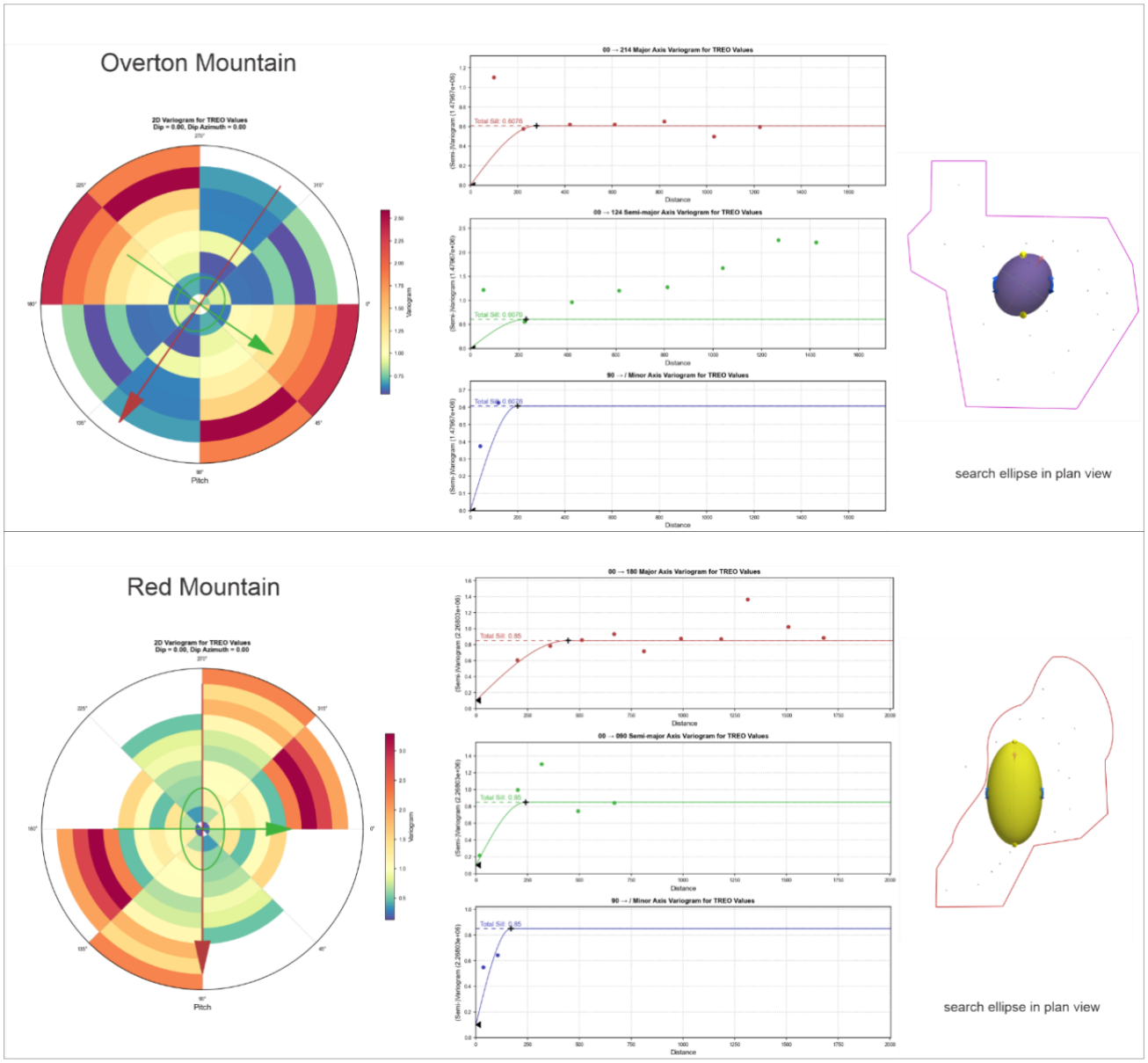
For personal use only

Table 3 - Halleck Creek Length-weighted Sampling and Analysis Statistics

Name	Count	Length	Mean	Minimum	Median	Maximum
TREO	6065	8841	3,289	5	3,659	11,054
LREO	6066	8843	2,939	4	3,286	10,192
HREO	6065	8841	349	1	362	984
MREO	6066	8843	893	1	984	3,153
Ce2O3	6066	8843	1420	2	1,591	4,938
Dy2O3	6066	8843	40	0	41	123
Er2O3	6066	8843	18	0	19	55
Eu2O3	6065	8841	11	0	12	23
Gd2O3	6066	8843	62	0	66	200
Ho2O3	6066	8843	7	0	7	22
La2O3	6066	8843	674	1	758	2,310
Lu2O3	6066	8843	2	0	2	7
Nd2O3	6066	8843	592	1	653	2,070
Pr6O11	6066	8843	161	0	176	657
Sc2O3	6039	8810	12	0	9	81
Sm2O3	6066	8843	92	0	101	334
Tb4O7	6066	8843	8	0	8	27
Tm2O3	6066	8843	2	0	2	7
UO2	6064	8840	7	0	7	62
Y2O3	6064	8840	182	1	188	551
Yb2O3	6066	8843	15	0	15	42
Interval Length	6066		1	0.03	1.5	2.64

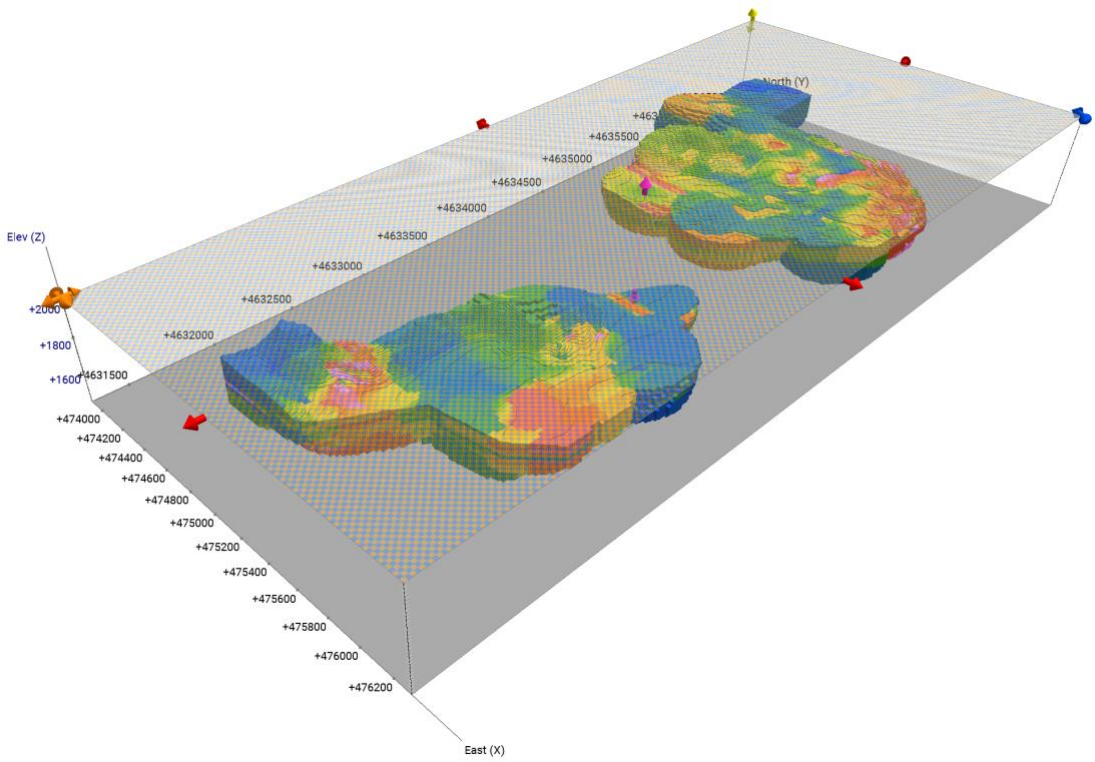
For personal use only

For personal use only



Note: Figure from Odessa, 2024

Figure 5 - Variograms for Halleck Creek



Note: Figure from Odessa, 2024

Figure 6 - Halleck Creek Block Model Extent

For personal use only

Resource Classification

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.

The classification at Halleck Creek is based on the following key attribute:

Geological continuity between drillholes

- Mineralisation 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.

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. The Competent Person considers this spacing to be adequate to support a measured classification.

For personal use only

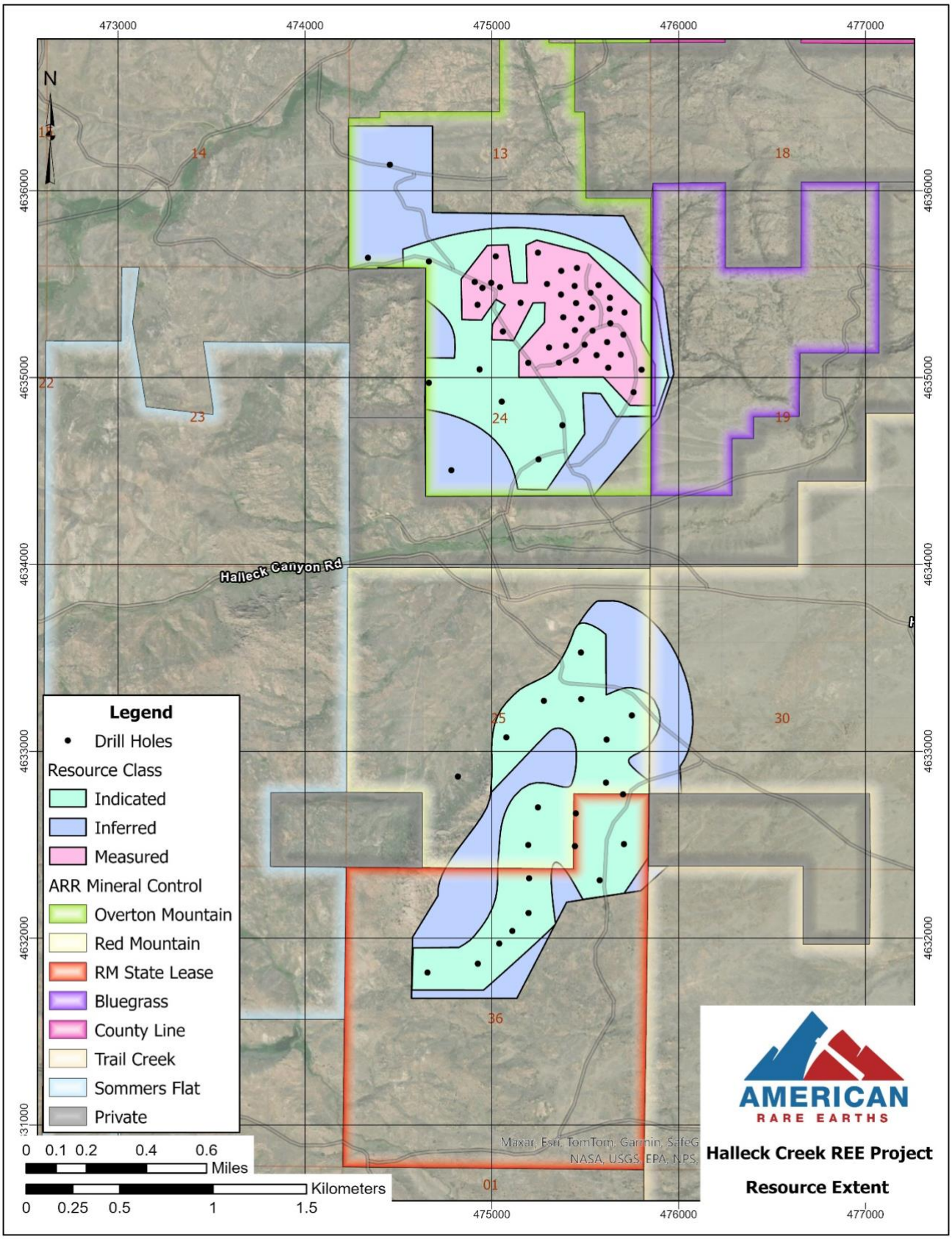


Figure 7 - Halleck Creek Resource Classes and Controlled Resource Extent

Cut-off Grades

A cut-off grade of 1,000ppm was used to estimated in-situ resources. Stantec calculated a net smelter return (NSR) value based on saleable rare earth element oxides: La_2O_3, Nd_2O_3, Pr_6O_{11}, Sm_2O_3, Dy_2O_3, and Tb_4O_7. The NSR value demonstrates that a 1,000ppm TREO cut-off grade meets the conditions for reporting of a Mineral Resource with reasonable prospects of eventual economic extraction.

ARR released the maiden Resource estimate for Halleck Creek in March 2023, which consisted of 1.43 billion tonnes of material with a TREO grade of 3,309 ppm, using a 1,500 ppm cut-off. The updated Resource estimates consist of 2.34 billion tonnes of material with a TREO grade of 3,196 ppm, using a 1,000 ppm cut-off grade (Table 4).

Resource Reconciliation

Between 2024 and 2023, total estimated resources increased by approximately 0.91 billion tonnes (64%). The estimated TREO grade decreased by 133 ppm TREO (-3%). Measured + Indicated resource increased by 0.79 billion tonnes (128%). Inferred resources increased by 0.18 billion tonnes (15%).

Differences in the resource estimates occurred due to:

- Change in cut-off grade from 1,500ppm to 1,000ppm TREO
- Increase in resource dimensions because of Sept/Oct 2023 Exploration
  - Drilling to 302 metres demonstrated that the resource continues at depth and remains open
  - Drill hole spacing of new and existing data increased confidence levels and allowed the resource area to expand
  - Drill hole spacing allowed measured resources to be defined and indicated resources to be redefined
  - Drilling assays increased the grade of the resource

Table 4 - Differences between 2024 Resource Update and 2023 Maiden Resource

Classification	Differences	Tonnage	*Grade*			
			TREO	LREO	HREO	MREO
		t	ppm	ppm	ppm	ppm
Meas + Ind	Difference	794,603,156	(94)	(36)	(10)	(11)
	% Difference	128%	-3%	-1%	-3%	-1%
Inferred	Difference	117,333,818	(206)	68	0	113
	% Difference	15%	-6%	3%	0%	18%
Total	**Difference**	**911,936,974**	**(114)**	**59**	**(2)**	**69**
	% Difference	**64%**	**-3%**	**2%**	**-1%**	**10%**

For personal use only

Mining and Metallurgy

Traditional open pit surface mining would be employed at Halleck Creek. The mineralised rock material occurs at surface and continues at depth as shown in block models.

ARR previously released results of preliminary metallurgical testwork demonstrating that up to 93% of gangue material can be separated from mineralised rare earth minerals using dense media separation (DMS) and wet high intensity magnetic separation (WHIMS).

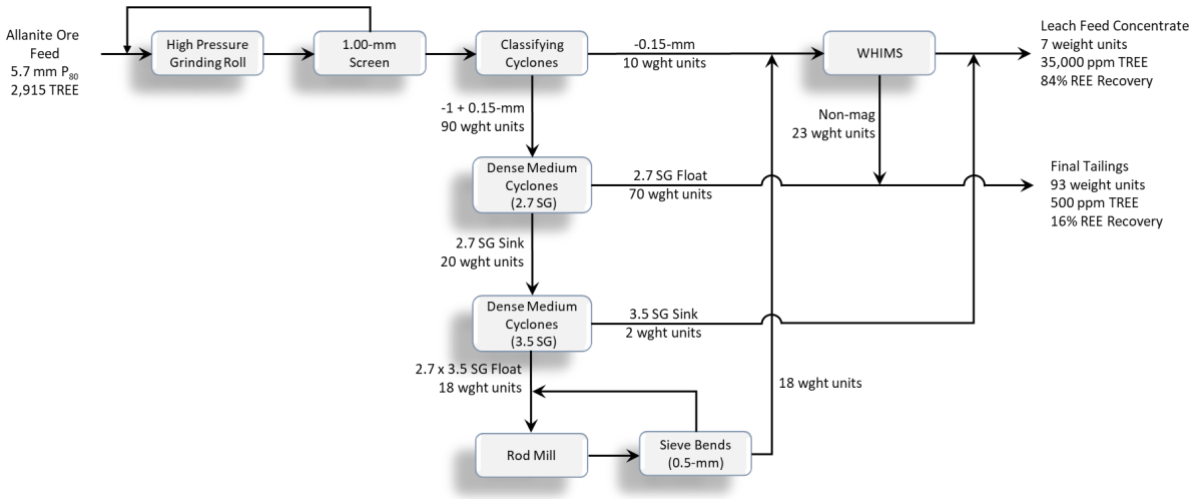


Figure 8 – Preliminary Beneficiation Flowsheet

ARR is undertaking preliminary work on leaching and refining of REE from WHIMS feed concentrate. Initial testing indicates that recoveries between 80% and 100% of light REE can be achieved through direct acid leaching at lower temperatures. The results from this testing will be announced as soon as completed.

Permitting Assessments

ARR is developing needs assessments for potential development of mines at Halleck Creek. in phases. The first phase consists of acquiring a license to explore on state mineral leases from WDEQ to collect rocks for bulk material testing and pilot scale metallurgical testwork. The second phase is to prepare and implement a detailed baseline environmental plan and mining permit to mine on state mineral leases.

ARR is developing partnerships with various Wyoming based businesses and entities to advance development of a mine on state lands. The Company believes such partnerships provide the shortest path to mine permits, maximising value Wyoming state resources, being good environmental stewards of the project.

Future Work for 2024

- JORC Scoping Study being prepared by Stantec
- Test mine approval for bulk sample permits (aka license to explore)
- Additional detailed metallurgical test work for beneficiation, leaching and refining of rare earth oxides
- Options for Pilot Plant being studied

For personal use only

This market announcement has been authorised for release by the Board of American Rare Earths Limited.

Competent Persons Statement: 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 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.

About American Rare Earths Limited:

American Rare Earths (ASX: ARR | ADRs - OTCQX: AMRRY | Common Shares - OTCQB: ARRNF) 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.

Media and Investor enquiries:

Jane Morgan
P: +61 (0) 405 555 618
E: jm@janemorganmanagement.com.au

For personal use only

For personal use only

JORC Code, 2012 Edition – Table 1 Halleck Creek		
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.

For personal use only

		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.
	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.	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.

For personal use only

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

For personal use only

	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.

For personal use only

	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

For personal use only

		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

For personal use only

		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

For personal use only

		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 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	Data from the Fall 2023 program will be at a high enough resolution to provide a measured resource at the Overton Mountain project area.

For personal use only

	Resource and Ore Reserve estimation procedure(s) and classifications applied.	
	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.

For personal use only

For personal use only

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.
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.

For personal use only

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 Competent Person should clearly explain why this is the case.	No Drilling data has been excluded.

For personal use only

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 1,500 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 5 ft (1.52 m) 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.*	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.

For personal use only

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.*	In hand specimen this rock is a red colored, hard and dense granite with areas of localised 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 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**

For personal use only

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.* *Data validation procedures used.*	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.
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 during the RC and core drilling projects. Mr. Jim Guilinger has not visited the site during the RC and core drilling projects. ARR will facilitate a site visit during the 2023 calendar year. Mr. Alf Gliman has not visited the site during the RC and core drilling projects. Mr. Gillman resides in Perth, Western Australia. Site visits to the project have so far been logistically difficult and very expensive.
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 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.

For personal use only

	The factors affecting continuity both of grade and geology.	
Dimensions	*The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	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. 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.
Estimation and modelling techniques	*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*	Odessa Resources updated block models for Overton Mountain and Red Mountain using the Leapfrog geological modelling software. **Block Model Parameters** Block Model Parameter: Value Parent Block Size: 20m Sub-block count (i, j, k): 4, 4, 4 Minimum block size (i, j, k): 5m ,5m, 5m Base point (x, y, z): 473900.00, 4631300.00, 2000.00 Boundary size (W x L x H): 2400.00, 5400.00, 600.00

For personal use only

description of computer software and parameters used.

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.

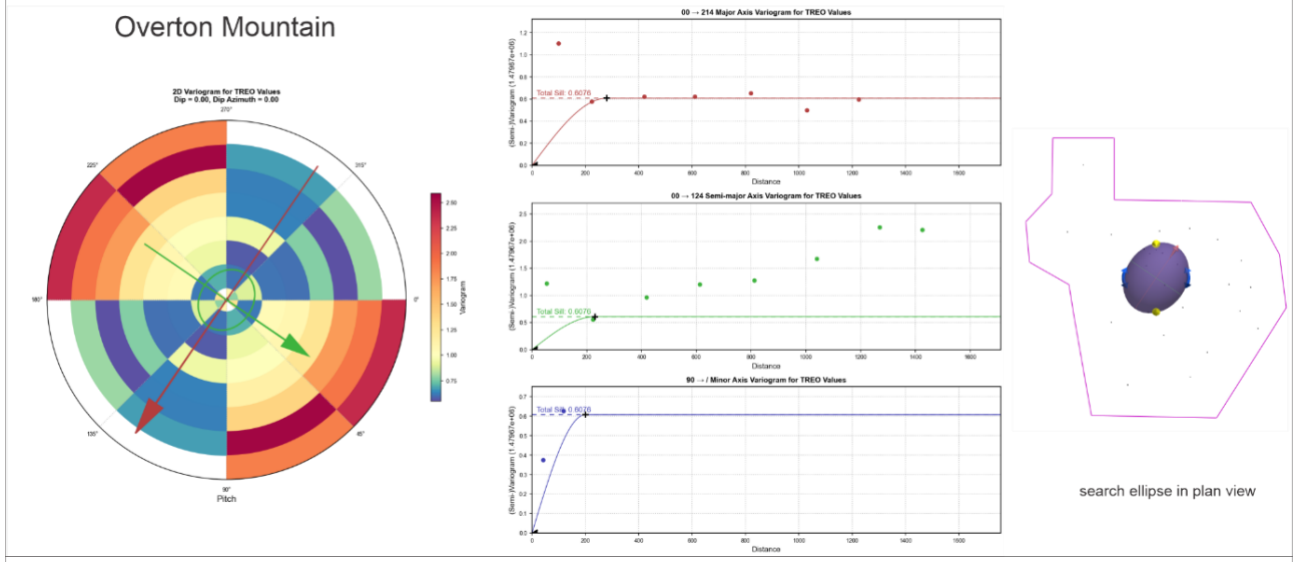
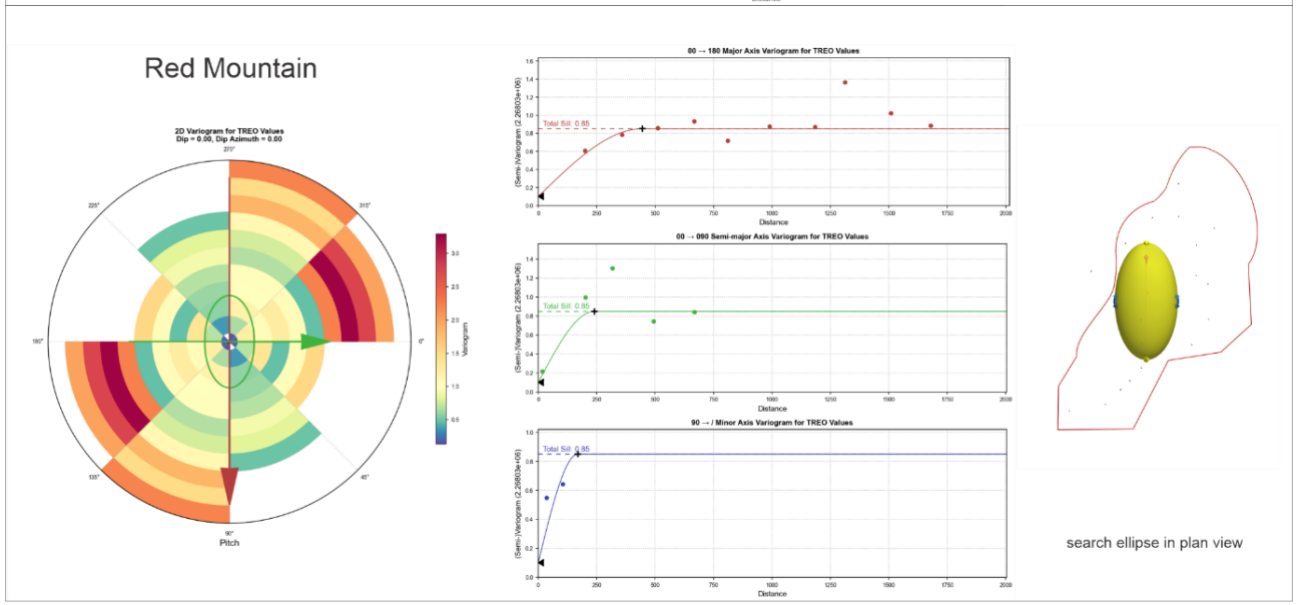
Azimuth	0
Dip	0
Pitch	0
Size in Blocks	120x270x30=972,000

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.

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

For personal use only

	Discussion of basis for using or not using grade cutting or capping. *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	 

For personal use only

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.

For personal use only

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 12 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*	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.

For personal use only

	project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. 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.

For personal use only

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 metal values, quality, quantity and distribution of the data).* *Whether the result appropriately reflects the Competent Person's view of the deposit.*	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. **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*	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.

For personal use only

	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 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.*	