



**PLEASE SEE THE CAUTIONARY STATEMENT FOLLOWING THIS LETTER**

March 21, 2024

Dear Shareholders,

Almost a year ago in May 2023, I wrote you with the announcement that we had made a unique discovery at our Brook Mine (“Brook”) near Sheridan, Wyoming. Based on initial testing, Ramaco and our partners at the Department of Energy’s National Energy Technology Laboratory (“NETL”) have concluded that Brook contains the largest unconventional deposit of rare earth elements (“REEs”) discovered to date in the United States. Given REE’s strategic importance and significant economic value this represented a singular potential opportunity for Ramaco.

We have made significant progress over the past year. Attention both to the Brook mine and the initial findings was widely publicized, most prominently in a Wall Street Journal article in November. What has not been widely discussed is what we have been doing over the past year. There has been tremendous effort to advance the testing and diligence necessary to assess and advance Ramaco’s progress toward commercialization of both the REEs, as well as other newly discovered critical minerals at Brook.

We began our efforts to determine the dimensions of this rare earth opportunity in 2019 after being informed by NETL that their testing had indicated the presence of unusually high levels of magnetic REEs in about 6 core samples we had provided them. Today, we now have data from over 575 core holes and 1,900 mineral samples we have tested. We continue to drill, test and analyze. However, based on the results of that data we now have reached a stage of critical mass where we feel that the Brook mine project has the potential to become one of, if not the first, new commercial rare earth project to be able to move forward in the United States.

Today we are publishing the interim geological update by our independent reserve geologist, Weir International, Inc. (“Weir”) of their Target Exploration Report (“Report”). This updates the original report prepared by Weir in May 2023. Together with this new Report and this letter we are addressing:

- 1) What steps have been taken to advance and minimize the risks of development,
- 2) What our test results have revealed to date,
- 3) What steps we will be taking in the future to attain commercialization, and
- 4) Some preliminary structural and financial options.

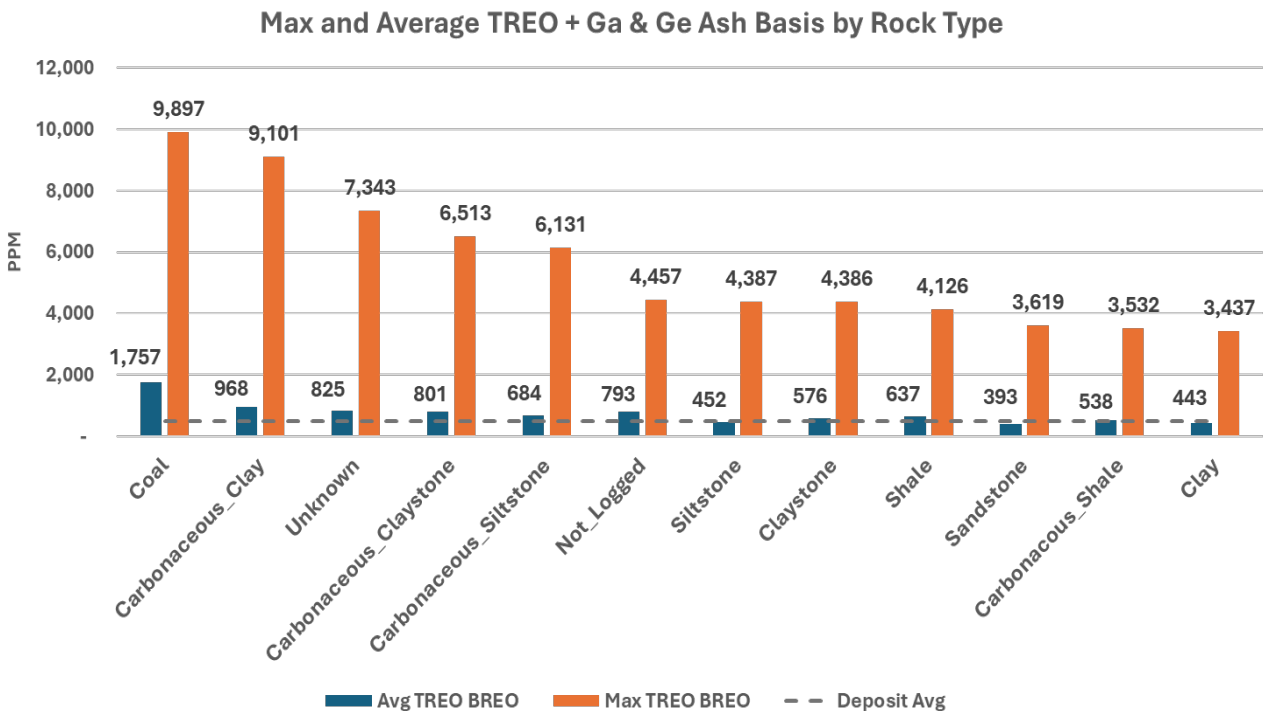
# I. Key Findings Regarding the REE and Critical Mineral Deposit

First, to summarize the principal test findings of the Report:

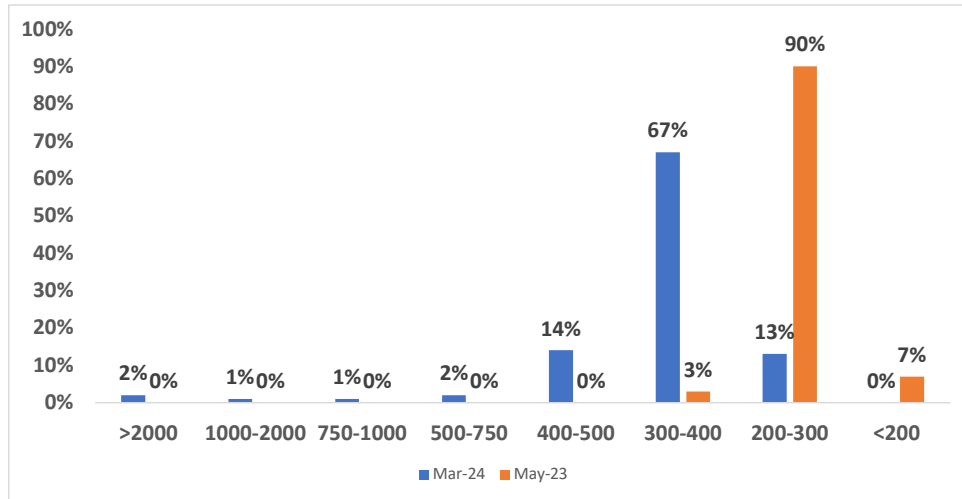
- Since May 2023 substantial additional drilling and testing has occurred in the current permit area at maximum depths of approximately 200'. Testing was done at the independent labs of SGS North America Inc. The results indicate that the reported high end REE volume estimate has increased by 90% to ~1.5 million tons (inclusive of two new critical minerals - germanium and gallium) with average parts per million (“ppm”) concentration grades of ~550 ppm.
- This almost doubles both the tonnage volume estimate and concentrations reported last May.

Brook Mine In-Place REO Exploration Target Tonnage ('000) and Grade (ppm) Estimate												
Range	Total		Primary		Secondary		Heavy		Light		Ga and Ge	
	Tons	Grade	Tons	Grade	Tons	Grade	Tons	Grade	Tons	Grade	Tons	Grade
Low	1,220	439	260	93	72	26	39	14	853	301	114	47
High	1,525	548	325	116	90	32	49	17	1,066	377	143	59

- A number of material lithologies showed maximum ppm concentrations exceeding 9,000 ppm. Indeed, coal showed the highest concentrations with almost a ~10,000 maximum ppm with an ~1,800 average ppm.



- The testing results reported in May 2023, reflected that only 3% of the deposit had concentrations in excess of 300 ppm. Based upon our continued and more extensive testing since last year, the data now reflect that approximately 90% of the deposit exceeds 300 ppm with an average concentration of ~550 ppm.

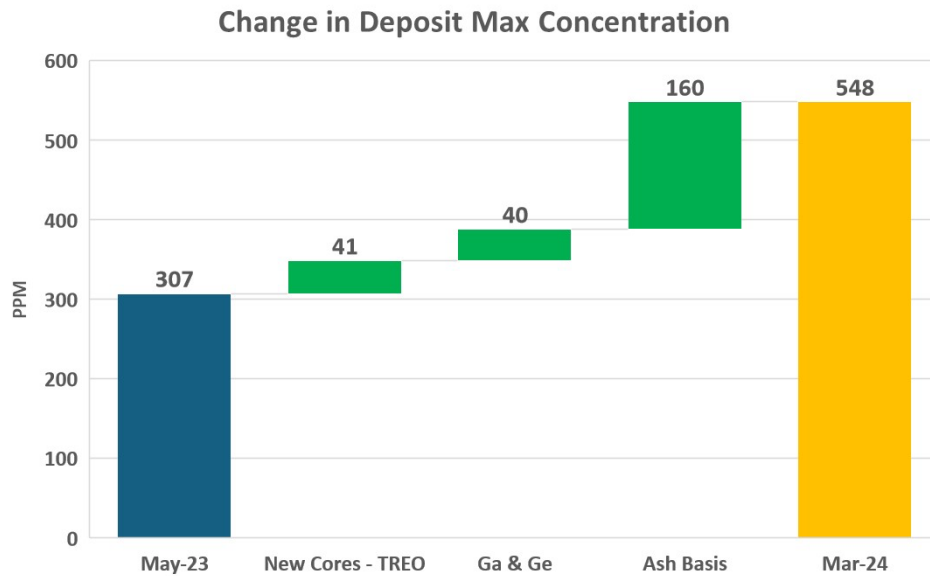


- The deposit has been found to contain unusually large quantities and concentrations of two high value critical minerals named germanium and gallium. China recently imposed export bans on both. Current preliminary tests indicate a volume of ~150,000 tons of these two minerals at a high concentration of roughly 60 ppm. For reference, the United States consumes roughly 200 tons annually of these minerals and the average concentration is roughly 20 ppm.
- A significant number of additional samples and data have been tested, with data included from older drill logs going back decades. In sum, to date 576 drill holes have been tested with over 1,900 ICP-MS tests on recent samples.

Brook Mine Drilling & Analysis Summary								
Exploration Program	Drill Holes		XRF Analysis			ICP-MS Analysis		
	Count	Total Depth (Ft)	Holes	Samples	Feet	Holes	Samples	Feet
Bighorn Coal Drilling	417	81,083	-	-	-	-	-	-
Ramaco Coal Drilling	36	7,700	-	-	-	-	-	-
2019 Drilling	6	1,132	3	125	74	5	115	74
2021-2022 Drilling	14	1,937	14	2,196	549	14	252	228
2022-2023 Drilling	102	21,593	94	26,173	6,661	94	1,585	1,404
Deep Drilling	1	856	0	0	0	0	0	0
<b>Total</b>	<b>576</b>	<b>114,301</b>	<b>111</b>	<b>28,494</b>	<b>7,284</b>	<b>113</b>	<b>1,952</b>	<b>1,707</b>

- For this Report, the ICP-MS testing was conducted on an “ash basis” for a significant number of samples where the testing protocol combusted the organic carbon material (like coal) before testing.

- The average ppm concentration across all lithologies tested on an ash basis showed roughly an 80% increase in concentration to ~550 ppm since the May 2023 reported test results.



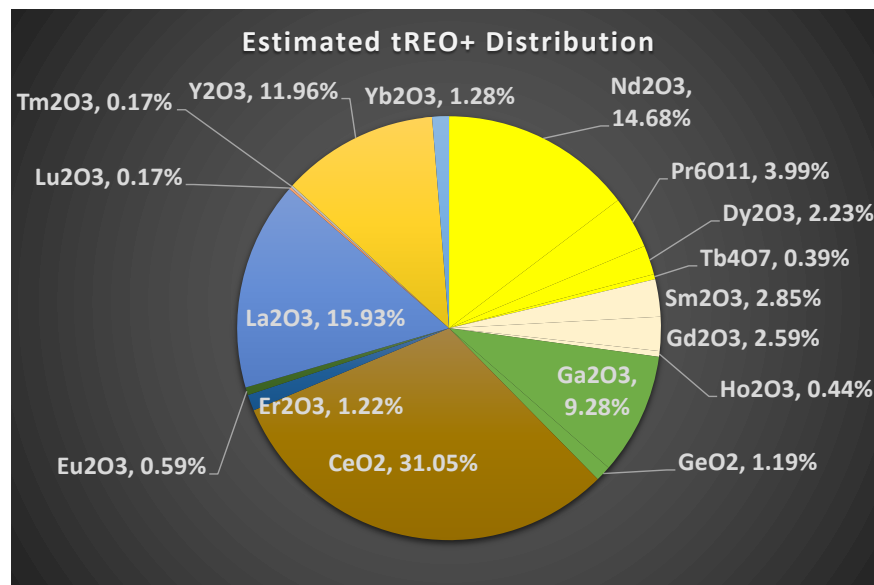
- The predominant material where REE tonnage is found was clay, carbonaceous material and claystone with 53%, with coal comprising roughly 70,000 tons or 5%.

Estimated In-Place TREO+G Tons By Lithology		
Lithology ('000s)	(High End of Range)	%
Carbonaceous Material	282.4	19%
Clay/Silt	267.9	18%
Claystone	248.5	16%
Coal	70.1	5%
Coal_Mixed	3.3	0%
Shale	87.1	6%
Sandstone	239.7	16%
Scoria	199.3	13%
Unconsolidated	49.5	3%
Not_Logged	59.7	4%
Other	17.3	1%
<b>Grand Total</b>	<b>1,524.8</b>	<b>100%</b>

- The following table and graph set forth the volumetric distribution percentage, current price per ton and estimated tonnage of the Brook primary and secondary magnetic REE elements, including germanium and gallium.

Brook Mine ICP Analysis			
REO	Mine REOs	\$/Ton Value	Est. Tonnage
<b>Primary Magnetic REOs</b>			
Neodymium	14.7%	\$45,359	
Praseodymium	4.0%	\$49,895	
Dysprosium	2.2%	\$232,239	
Terbium	0.4%	\$723,026	
<b>% of Primary Total</b>	<b>21.3%</b>	<b>\$78,040</b>	<b>325,000</b>
<b>Secondary Magnetic REOs</b>			
Samarium	2.9%	\$1,814	
Gadolinium	2.6%	\$20,838	
Holmium	0.4%	\$51,800	
<b>% of Secondary Total</b>	<b>5.9%</b>	<b>\$13,914</b>	<b>90,000</b>
<b>% of All Magnetic Total</b>	<b>27.2%</b>	<b>\$64,180</b>	<b>415,000</b>
<b>Banned Metals</b>			
Gallium	9.3%	\$268,796	
Germanium	1.2%	\$889,041	
<b>% of Ga and Ge</b>	<b>10.5%</b>	<b>\$338,995</b>	<b>160,000</b>
<b>% of All Magnetics + Ga and Ge</b>	<b>37.6%</b>	<b>\$140,658</b>	<b>575,000</b>
All Other REOs (including Light/Heavy)	62.4%	\$5,313	950,000
<b>Brook Mine Basket</b>	<b>100%</b>	<b>\$56,234</b>	<b>1,525,000</b>

- The development plan would focus on isolating, mining, and extracting pockets or concentrations of the more valuable magnetic elements and critical minerals. To the extent feasible the remaining less valuable lighter and other elements will be left in place.
- In summary, by volume roughly 21% of the REEs are primary magnetics, 6% are secondary magnetics and approximately 11% are germanium and gallium. Roughly 38% or ~575,000 tons of the deposit on a life of mine basis contains these magnetic REEs and critical minerals. They have a current “basket price “of over \$140,000 per ton. When all other less valuable light and heavy element REEs are included in the basket the value declines to approximately \$56,000 per ton.



## II. Where We Are Now

As I wrote last May, the REE business is fundamentally an industrial chemical business. Basically, it is “rare” that these elements and critical minerals are found in sufficient concentration to be economically mined, extracted, separated, and then ultimately refined to be used in the multitude of electronic forms of applications.

We have now undertaken a number of preliminary steps toward the commercial development of the Brook Mine REE deposit. Although this is still a work in progress, through our extensive testing to date we are confident that the Brook mine REE deposit is now both sufficiently large and concentrated that it could become the first new rare earth project to reach commercial development in this country. What we have established at this stage are:

- This deposit stands out due to its above-average concentrations of magnetic rare earth elements, including terbium and dysprosium, for which there is currently no domestic source of production,
- The deposit is of immense volumetric size both in terms of REEs and the critical minerals germanium and gallium,
- Ramaco owns the mineral deposit, which is on private not federal land,
- Ramaco has already permitted the mine, initiated mining last year, and has completed its first cut to remove overburden near surface ore zones to gather bulk sample data in preparation for further mining and pilot operations over the coming months,
- The deposit shows concentration levels which we believe would be economically feasible to extract, separate and refine, and which we expect will be further validated in a subsequent techno-economic analysis,
- The deposit lacks the radioactive elements typically associated with hard rock rare earth deposits, which is a major advantage for both environmental and economic processing, and
- Ramaco is financially and operationally capable of developing the assets.

With that as an overview, there are a few matters I'd like to highlight. We had a shift in our reporting methodology from the May 2023 Weir report. We now present rare earth element concentrations on an “ash” basis. This basically means the organic material is combusted before the mineral is ICP-MS tested. When the organic carbon is burned off, what is left is mineral matter containing rare earth elements, increasing the concentration, but not the tonnage of the deposit.

Our initial testing protocol was performed on a “whole rock” basis which was consistent with conventional hard mineral REE deposits. It did not however account for the unconventional nature of the Brook deposit. Our REEs are found in *coal and carbon*

*concentrated deposits* and not in hard minerals, which is the source of most other REEs currently being mined.

The result is that the reporting on an “ash” basis increased the reported concentration levels significantly. As an example, a sample with a 200 part per million (ppm) concentration in a deposit with 5% ash would find its concentration level increased 20x on an “ash” basis to say 4,000 ppm. Additionally, by *not* ashing the samples prior to testing, it has been found and documented in academic literature (and by SGS) that the dissolved carbon in the sample can interfere with ICP-MS analysis and mask the true concentration of the rare earth elements, potentially by as much as 10%.

To date we have ICP-MS retested roughly 3-5% of the ~1900 samples. We are in the process of both testing the remainder of the samples, as well as retesting existing coal core zones where the organic matter may have “masked” the mineral readings. We expect the results of this will ultimately show even greater quantities and concentrations than we have reported here.

This adjustment is pivotal as it will enable us to focus on high concentration zones within coal and highly carbonaceous clays and siltstones. By reporting concentrations on the mineral matter itself rather than including the organic portion, we provide a more accurate representation of the feedstock for processing. This approach allows for better comparison with hard rock REE deposits and ensures a clearer understanding of the true potential of our resource.

Although we have already performed a great deal of drilling and testing this will be an on-going component of the development. We have tested only a third of the overall property and at shallow depths. We recently completed a deep core to ~900 feet which we are in the process of testing. As we delve deeper into coring the overall deposit and enhance our sampling techniques, we anticipate further increase in both tonnage and concentration, particularly in coal zones previously bypassed due to instrument calibration.

Furthermore, our exploration efforts have unveiled single point concentrations nearing 10,000 ppm Total Rare Earth Oxides (“TREO”), including gallium and germanium, within several lithologies. These lithologies are contained within the 25% of our deposit that is considered to be coal and carbonaceous material. With ongoing sampling initiatives, we foresee a considerable increase in both concentration and tonnage within these high-grade rock types.

### **III. Next Steps**

At this point our next development steps will involve the commencement of REE extraction testing through a number of sequential digestion methodologies. Sequential digestion is the process of subjecting the ore samples to multiple types of reagents. The

amount of REE that is extracted with that specific reagent tells you about the types of minerals the REEs are associated with.

We expect that this approach will allow us to elucidate the mineralogical associations of REEs within our ore and identify the most economical leaching methods. Sequential digestion will provide valuable insights into the complex geological makeup of our coal zones and will aid in our efforts to optimize our processing strategies for maximum efficiency and cost-effectiveness.

Alongside sequential digestion, we are embarking on comprehensive tests to identify mechanical and physical concentrating techniques suitable for processing our ore on a commercially feasible basis. These techniques encompass grinding, density and gravity separations, visual separations, and magnetic separations. By employing these methods, we aim to enhance the concentration of rare earth elements before initiating any chemical leaching processes. To ensure the efficacy of our approach, we will conduct full mineralogical analyses utilizing X-ray diffraction (XRD) and scanning electron microscopy (SEM) to refine our options and with the objective of optimizing the extraction process.

After we have performed multiple sequential digestion tests on our primary mineralized lithologies, we can optimize the steps to be as simple and economic as possible. In parallel, in addition to "hydrometallurgical" approaches like sequential extraction, and in collaboration with our NETL partners, we are also exploring both conventional and unconventional processing techniques. These innovative approaches have the potential to revolutionize rare earth element extraction, offering increased efficiency and reduced environmental impact.

We are also diligently constructing an internal techno-economic model to guide our decision-making processes. This comprehensive model will facilitate the determination of cutoff grades, enable economic and financial simulations, and identify key variables impacting a financial valuation. Based on data being developed we expect to have this complete internally by later this year which will be independently reviewed and validated by SRK Consulting, our third-party consultant.

We are also finding that there could be significant concentrations of REEs at relatively shallow depths that we might be able to mine at an early stage to provide initial revenue. Interestingly, there also appear to be even greater concentrations of REEs at deeper levels that we need to further investigate that might be accessed by some form of in-situ injection mining. This technique already has applications in copper and uranium mining but, has never been applied to coal-based REEs. However, much planning and analysis must be done before conclusions concerning mine planning and the ultimate approach can be reached.

In addition to sequential digestion of our core samples, we are continuing our geological analysis which involves a meticulous correlation of high-grade core samples



with geophysical well logs. By identifying key variables driving high concentration deposition, we aim to unravel the complex geological processes that have shaped the Brook deposit.

This integrated approach has already yielded some promising results, as we uncover important trends and delineate high-grade zones essential for targeted extraction. This work will be critical in selecting the mining method(s) most appropriate for the Brook deposit, either by conventional surface or highwall mining or perhaps using underground in-situ mining techniques.

As mentioned above, prior to leaching ore, we believe that it will be imperative to separate non-ore minerals from the ore through physical concentration. This process is essential for maximizing extraction efficiency. To facilitate the high volume of sample needed, we are in the process of drilling specific boreholes to extract ample material from three of our highest-grade ore zones. These bulk samples will enable us to conduct comprehensive mechanical concentration tests, with the goal of optimizing our processes for maximum yield.

Following the optimization of physical concentration and sequential digestion, our attention will turn to the extraction of dissolved REEs from the highly concentrated leachate. We are exploring various extraction techniques, including advanced solvent extraction, ion exchange, and organic ligands, to identify the most cost-effective and environmentally benign method. We expect that whatever extraction technique we ultimately decide to implement will likely be a closed loop system with minimal waste generation. Collaborating with industry experts, we will select the optimal approach based on rigorous testing and techno-economic modeling.

As we progress through laboratory-scale testing, we remain committed to the objectives of ensuring scalability, sustainability, and efficiency. After successfully developing a mineral processing flowsheet based on laboratory testing, our next milestone involves transitioning to pilot production on-site, where we will refine our process flowsheet using bulk samples obtained from mining. We expect that this iterative approach will allow us to fine-tune our operations and maximize the commercial value of our rare earth deposits.

We hope to complete our techno economic and pilot plant design within 2024. We would then move from lab scale work to initial pilot plant development, construction, and production which we expect will begin in 2025.

In the pilot plant phase, our primary objectives would be to validate the production flowsheet derived from laboratory testing, ensure the integrated operation of physical concentrating, leaching, and processing the REEs from leachate. This would allow us to adapt and refine production and separation processes, thereby mitigating design and capital risks for full-scale implementation.

Upon successful demonstration of continuous feed and stabilized product quality at the pilot-scale, the transition would be made to full-scale production. The timeframe for scaling to full production from pilot production will depend on a variety of factors such as the complexity of the final processing flowsheet, the availability of resources, and any regulatory requirements.

This transition will necessitate the addition of more circuits and equipment to the pilot facility in order to accommodate higher ore volumes as we scale from processing a few tons to many tons per day. Depending on the complexity of the processing and ore variability, the scale-up phase to full commercial production could span multiple months and involve several crucial steps.

As a first step, the equipment used in the pilot plant must be assessed for its scalability, ensuring that it can handle the increased volume while maintaining efficiency as the processing goes from a few tons to many tons per day.

Similarly, the scaling up leaching circuits and solvent extraction processes poses additional challenges. Leaching processes involve extracting rare earth elements from the feedstock. It uses chemical solutions, which require careful control of reaction conditions such as temperature, pH, and reagent concentrations and environmental and regulatory compliance.

In general, scaling from a pilot plant to full production can take well over a year. Assuming a successful pilot plant launch, we would hope to begin possible commercial production sometime in 2026.

#### **IV. Future Structural and Financial Options**

We will devote a great deal of thoughtful analysis as to how to develop these unique and valuable rare earth and mineral assets. In parallel, we will also explore the corporate structure and financial arrangements most likely to maximize long term shareholder value. At this stage, we believe that we have established that we have a world class REE and critical mineral deposit with sufficient mineral concentration to merit the probability of a successful commercial development.

As discussed in this letter there are numerous chemical, metallurgical, mineralogy and mining milestones we will be pursuing in the months ahead. As noted we will continue testing and techno-economic analysis this year with the expectation of beginning pilot facility development in 2025. It is our expectation that by some point in 2026 we will transition our pilot operations and reach the ability to launch a commercial production operation at initial scale.

Over the coming months in 2024 we hope to develop the techno-economic analysis to provide visibility on what would be the financial metrics and capital

requirements necessary to pursue this unique business opportunity. Critical mineral development is very different from the metallurgical coal business, but it also has similar characteristics.

Our core stewardship of Ramaco is to add maximum shareholder value to long term holders of our stock. Critical mineral companies in general and rare earth companies in particular, trade at multiples far exceeding those of any coal group.


We believe that the investment necessary to commercialize this asset is within both our operational and financial capabilities. This is especially so as our metallurgical operations mature in a few years at a higher level of production with correspondingly higher levels of cash flow generation. The REE and critical mineral business may present an extremely rewarding additional new direction for Ramaco.

Once we understand the capital and operational requirements to develop this new REE business we can more logically assess how this unique opportunity should be pursued both structurally and financially. One option would be to internally fund the investment from Ramaco's own growing financial resources. Ramaco would then operate two lines of business, both in the critical minerals field- one in metallurgical coal and the other in rare earths. Alternatively, Ramaco could spin off its rare earth operating business into a new separate vehicle as a standalone company, perhaps with external funding and still maintain a royalty position in the REE and minerals mined through our METCB shares.

As expected in any endeavor of this magnitude, there are intricate pros and cons to each approach. There may also be other promising and novel approaches that we have not yet contemplated. We will study all alternatives carefully and of course seek and consider thoughtful counsel on all aspects as we proceed.

Our guiding principle will be what is in the best interest for building long-term value for our shareholders.

All the best-



Randall W. Atkins  
Chairman and Chief Executive Officer

## CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

Many of the statements contained in this letter constitute “forward-looking statements” within the meaning of the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”) and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). All statements, other than statements of historical fact included in this letter, regarding our strategy, objectives, intended investigative, research and development efforts, future operations, estimated value of the REE deposits, projected costs, prospects, plans and objectives of management are forward-looking statements. When used in this letter the words “could,” “believe,” “anticipate,” “intend,” “estimate,” “expect,” “project” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain such identifying words. Forward-looking statements may include statements about:

- identification and implementation of commercially feasible extraction processes, and establishment of pilot and production extraction facilities;
- expected costs to develop planned and future operations, including the costs to construct necessary processing, refuse disposal and transport facilities;
- the availability of the equipment and components necessary to construct our pilot and production extraction facilities;
- estimated quantities or quality of our reserves;
- our ability to obtain additional financing on favorable terms, if required, to complete the contemplated development;
- maintenance, operating or other expenses or changes in the timing thereof;
- competition in REE mining and extraction markets;
- the price of REEs;
- compliance with stringent laws and regulations, including environmental, climate change and health and safety regulations, and permitting requirements, as well as changes in the regulatory environment, the adoption of new or revised laws, regulations and permitting requirements;
- potential legal proceedings and regulatory inquiries against us;
- the impact of weather and natural disasters on plant construction, demand, production and transportation;
- geologic, equipment, permitting, site access and operational risks and new technologies related to REE mining;
- transportation availability, performance and costs;
- availability, timing of delivery and costs of key supplies, capital equipment or commodities such as diesel fuel, steel, explosives and tires;

- timely review and approval of permits, permit renewals, extensions and amendments by regulatory authorities;
- our ability to comply with certain debt covenants; and
- risks related to weakened global economic conditions and inflation.

These forward-looking statements represent Ramaco Resources' expectations or beliefs concerning guidance, future events, anticipated revenue, future demand and production levels, macroeconomic trends, the development of ongoing projects, costs and expectations regarding the commercial feasibility of mining and extracting Ramaco's REEs, and it is possible that the results described in this letter will not be achieved. These forward-looking statements are subject to risks, uncertainties and other factors, many of which are outside of Ramaco Resources' control, which could cause actual results to differ materially from the results discussed in the forward-looking statements. Any forward-looking statement speaks only as of the date on which it is made, and, except as required by law, Ramaco Resources does not undertake any obligation to update or revise any forward-looking statement, whether as a result of new information, future events or otherwise. New factors emerge from time to time, and it is not possible for Ramaco Resources to predict all such factors. When considering these forward-looking statements, you should keep in mind the risk factors and other cautionary statements found in Ramaco Resources' filings with the Securities and Exchange Commission ("SEC"), including its Annual Report on Form 10-K and Quarterly Reports on Form 10-Q. The risk factors and other factors noted in Ramaco Resources' SEC filings could cause its actual results to differ materially from those contained in any forward-looking statement.